PART III.

APPENDICES.

APPENDIX A.

HIGH SCHOOL AND UNIVERSITY MATRICULATION EXAMINATIONS, 1923.

The High School and University Matriculation Examinations began on June 25th and were held simultaneously in the High and Superior School buildings at Abbotsford, Agassiz, Armstrong, Atlin (Public School), Bridgeport, Burnaby North, Burnaby South, Chase, Chilliwack, Courtenay, Cranbrook, Creston, Cumberland, Dennison, Duncan, Enderby, Esquimalt, Fernie, Golden, Granby Bay, Grand Forks, Greenwood, Hedley, Howe Sound, Hudson Hope (Public School), Ioco, Kamloops, Kaslo, Kelowna, Keremeos, Ladner, Ladysmith, Landry, Langley, MacLean (Maple Ridge), Matsqui, Merritt, Mission, Nakusp, Nanaimo, Naramata, Nelson, New Denver, New Westminster, Oak Bay, Ocean Falls, Oyama, Peachland, Penticton, Point Grey (King George V. and Prince of Wales), Port Alberni, Port Coquitlam, Powell River, Prince George, Prince Rupert, Princeton, Quesnel, Revelstoke, Robson, Rolla (Public School), Rossland, Ruskin, Rutland, Salmon Arm, Silverton, Slocan, Smithers, Sooke, Squamish (Public School), Stewart (Public School), Summerland, Surrey, Trail, Vananda, Vancouver (Britannia, King Edward, King George, Kitsilano, Technical), Vancouver North, Vancouver South, Vanderhoof, Vernon, Victoria, Waldo, and Westbank Townsite.

The Examiners appointed to act with the Superintendent of Education were: H. Ashton, M.A., D.Lett., D.Litt.; J. C. Brady, M.A.; R. H. Clark, M.A., Ph.D.; J. G. Davidson, B.A., Ph.D.; J. B. DeLong, B.A.; G. A. Fergusson, B.A.; M. E. Grenfell, B.A.; J. H. Hall, B.Litt.; Jas. Henderson, M.A.; A. H. Hutchinson, M.A., Ph.D.; S. W. Mathews, M.A.; D. L. MacLaurin, B.A.; J. T. E. Palmer, B.A.; E. B. Paul, M.A.; L. Richardson, B.Sc.; L. F. Robertson, M.A.; D. M. Robinson, B.A.; E. H. Russell, B.A.; G. G. Sedgewick, B.A., Ph.D.; H. H. Smith, B.A.; F. H. Soward, B.A., B.Litt.; A Sullivan, B.A.; R. W. Suter, B.A., B.Sc.

The following are the names of the winners of His Excellency the Governor-General's silver medals:—

David Cunningham Warden, South Vancouver High School.
Margaret G. Keillor, King George High School, Vancouver.
Clarke Arthur Simpkins, Kitsilano High School, Vancouver.
Frederick B. Johnston, King Edward High School, Vancouver.
Helena Margaretta Underhill, South Burnaby High School.

The names of the winners of the Royal Institution Scholarships awarded by the University of British Columbia on the results of the Junior Matriculation Examination follow:—

Student.	High School.	Standing obtained at Examination.	Scholarship.
David Cunningham Warden	South Vancouver	First in Province	$150
Mary Evelyn Wheeler	Victoria	" District No. 1	100
Mary Thompson	North Vancouver	" " 2	100
Margaret G. Keillor	King George, Vancouver	" " 3	100
Elizabeth L. Scott	South Vancouver	" " 4	100
Winnifred D. Odams	Kamloops	" " 5	100
Nora M. Brander	Cranbrook	" " 6	100

The name of the winner of the Royal Institution Scholarship awarded by the University of British Columbia on the result of the Senior Matriculation follows:—

Student.	High School.	Standing obtained at Examination.	Scholarship.
Barbara G. Stirling	St. Michael's, Vernon	First in Province	$75

NUMBER OF SUCCESSFUL CANDIDATES AT EACH CENTRE.

Examination Centre.	Preliminary Course, Junior Grade.	Advanced Course, Junior Grade.	Third-year Commercial.	Third-year Technical.	Third-year Household Science.	Junior Matriculation.	Senior Matriculation.	Total.
Abbotsford	14	6	..	..	..	..	..	20
Agassiz	..	..	..	..	..	3	..	3
Armstrong:								
Armstrong High	2	..	..	..	..	6	1	9
Private Study	..	..	..	..	..	..	1	1
Bridgeport	..	..	..	..	..	9	..	9
Burnaby South	52	..	..	..	..	8	..	60
Chase	1	1	..	..	..	..	..	2
Chilliwack	..	..	..	..	..	18	..	18
Courtenay	..	..	..	..	..	6	..	6
Cranbrook	..	..	..	..	..	11	..	11
Creston:								
Creston High	2	2	..	..	..	4	..	8
Camp Lister Public	1	..	..	..	..	..	..	1
Cumberland	..	..	..	..	..	5	2	7
Duncan:								
Duncan High	..	..	..	..	..	4	..	4
Quamichan Lake (Private)	..	..	..	..	..	1	..	1
Queen Margaret's School	1	1	..	..	..	..	..	2
Shawnigan Lake Preparatory	6	6	..	..	..	2	..	14
Enderby:								
Enderby High	2	2	..	..	..	5	..	9
Private Study	..	..	..	..	..	1	..	1
Esquimalt:								
Esquimalt High	..	..	..	..	..	3	..	3
Private Study	..	..	..	..	..	1	..	1
Fernie	15	6	..	..	..	4	3	28
Golden:								
Private Study	..	..	..	..	..	1	..	1
Granby Bay	..	..	..	..	..	4	..	4
Grand Forks	20	17	..	..	..	9	..	46
Greenwood:								
Greenwood Superior	1	1	..	..	..	..	..	2
Private Study	..	..	..	..	..	1	..	1
Hedley	3	2	..	..	..	..	..	5
Howe Sound:								
Howe Sound High	1	..	..	..	..	1	..	2
Bowen Island Public	1	..	..	..	..	..	..	1
Private Study	..	1	..	..	..	..	..	1
Hudson Hope Public	1	..	..	..	..	..	..	1
Ioco	4	1	..	..	..	..	..	5
Kamloops:								
Kamloops High	..	..	..	..	..	12	..	12
Pinantan Public	1	..	..	..	..	..	..	1
St. Ann's Academy	3	..	..	..	..	..	..	3
Private Study	..	..	..	..	..	1	..	1
Kaslo	2	1	..	..	..	2	1	6
Kelowna:								
Kelowna High	4	7	..	..	..	15	..	26
Marshall's Private	..	..	..	..	..	..	1	1
Keremeos:								
Keremeos High	..	..	..	..	..	6	..	6
Private Study	..	..	..	..	..	1	..	1
Ladner	..	7	..	..	..	7	..	14
Ladysmith	14	..	..	..	..	3	1	18
Langley	..	..	..	..	..	7	..	7

Number of Successful Candidates at each Centre—*Continued.*

Examination Centre.	Preliminary Course, Junior Grade.	Advanced Course, Junior Grade.	Third-year Commercial.	Third-year Technical.	Third-year Household Science.	Junior Matriculation.	Senior Matriculation.	Total.
Maple Ridge:								
MacLean High	..	..	..	..	..	3	..	3
Matsqui:								
Dennison High	7	3	..	..	..	1	..	11
Matsqui High	..	..	..	..	..	10	..	10
Merritt	..	..	..	..	..	5	..	5
Mission	..	..	..	..	..	7	..	7
Nakusp	2	..	..	..	..	2	..	4
Nanaimo:								
Nanaimo High	..	..	..	..	..	22	..	22
Parksville Public	1	..	..	..	..	..	..	1
Private Study	..	..	..	..	..	1	..	1
Nelson:								
Nelson High	..	..	..	..	..	19	6	25
Procter Public	1	..	..	..	..	..	..	1
St. Joseph's Academy	..	2	..	..	..	..	..	2
Private Study	..	..	..	..	..	1	..	1
New Denver:								
New Denver High	2	1	..	..	..	2	..	5
Rosebery Public	2	..	..	..	..	..	..	2
Sandon Public	2	..	..	..	..	..	..	2
New Westminster:								
Duke of Connaught High	..	..	..	..	..	41	..	41
T. J. Trapp Technical High	..	..	..	2	..	3	..	5
Columbia College	3	1	..	..	..	3	..	7
Oak Bay:								
Oak Bay High	..	..	..	..	..	18	..	18
Cranleigh House	1	..	..	..	..	1	..	2
St. Aidan's	1	..	..	..	..	..	..	1
St. Michael's	5	..	..	..	..	..	..	5
Ocean Falls	..	..	..	..	..	2	..	2
Oyama:								
Oyama Superior	5	2	..	..	..	..	..	7
Winfield Public	3	..	..	..	..	..	..	3
Peachland	..	..	..	..	..	1	..	1
Penticton:								
Penticton High	..	..	..	..	..	10	..	10
Private Study	..	..	..	..	..	1	..	1
Point Grey:								
King George V. High	..	..	..	..	..	42	..	42
Prince of Wales High	..	..	..	..	..	31	..	31
Private Study	1	..	..	..	..	1	..	2
Port Alberni:								
Port Alberni High	..	..	..	..	..	3	..	3
Private Study	..	..	..	..	..	1	..	1
Port Coquitlam:								
Port Coquitlam High	..	..	..	..	..	2	..	2
Pitt Meadows Public	2	1	..	..	..	..	..	3
Powell River:								
Seaford Public	1	..	..	..	..	..	..	1
Squirrel Cove Public	..	1	..	..	..	..	..	1
Prince George	..	..	..	..	..	4	..	4
Prince Rupert:								
Prince Rupert High	..	..	1	..	..	10	5	16
Private Study	..	..	..	..	..	4	..	4

NUMBER OF SUCCESSFUL CANDIDATES AT EACH CENTRE—*Continued.*

Examination Centre.	Preliminary Course, Junior Grade.	Advanced Course, Junior Grade.	Third-year Commercial.	Third-year Technical.	Third-year Household Science.	Junior Matriculation.	Senior Matriculation.	Total.
Princeton:								
Princeton High	4	1	..	..	..	..	..	5
Coalmont Public	1	..	..	..	..	..	..	1
Quesnel	..	1	..	..	..	..	..	1
Revelstoke:								
Revelstoke High	..	..	..	..	..	12	..	12
Private Study	1	..	..	..	..	..	..	1
Robson:								
Robson Superior	2	9	..	..	..	..	..	11
Syringa Creek	1	..	..	..	..	..	..	1
Rossland	..	..	..	..	..	13	..	13
Ruskin	4	1	..	..	..	..	..	5
Rutland	5	3	..	..	..	2	..	10
Salmon Arm:								
Salmon Arm High	..	..	..	..	..	8	..	8
Private Study	..	..	..	..	..	1	..	1
Silverton	9	4	..	..	..	3	..	16
Slocan	5	6	..	..	..	3	..	14
Smithers:								
New Hazelton Public	1	..	..	..	..	..	..	1
North Bulkley Public	1	..	..	..	..	..	..	1
Sooke	6	..	..	..	..	..	..	6
Squamish	3	..	..	..	..	..	..	3
Summerland	4	..	..	..	..	6	..	10
Surrey	..	..	..	..	..	9	..	9
Trail:								
Trail High	..	..	..	..	..	12	4	16
Private Study	..	..	..	..	..	1	..	1
Vananda	2	1	..	..	..	..	..	3
Vancouver:								
Britannia High	..	..	..	..	..	43	..	43
King Edward High	..	..	..	..	12	90	..	102
High School of Commerce	..	..	22	..	..	..	..	22
King George High	..	..	..	..	..	63	..	63
Kitsilano High	..	..	..	..	..	46	..	46
Technical High	..	..	..	4	..	19	..	23
B.C. School of Pharmacy	..	..	..	..	..	4	1	5
Can. Extension University	..	..	..	..	..	2	..	2
Convent of the Sacred Heart	..	..	..	..	..	1	..	1
Crofton House	..	17	..	..	..	15	..	32
St. Ann's Academy	..	..	..	..	..	2	..	2
St. Marina School	..	3	..	..	..	3	..	6
Private Study	..	..	..	..	..	20	..	20
Vancouver, North:								
North Vancouver High	..	..	..	..	..	29	..	29
Kingsley Private School	2	..	..	..	..	..	..	2
Private Study	..	..	..	..	..	4	..	4
Vancouver, South:								
South Vancouver High	..	..	9	..	..	83	..	92
Private Study	1	..	..	..	..	1	..	2
Vanderhoof:								
Vanderhoof Superior	5	..	..	..	..	..	..	5
Nechako Public	1	..	..	..	..	..	..	1
Vernon:								
Vernon High	5	2	..	..	..	10	1	18
Okanagan Centre Public	1	..	..	..	..	..	..	1

Number of Successful Candidates at each Centre—*Continued.*

Examination Centre.	Preliminary Course, Junior Grade.	Advanced Course, Junior Grade.	Third-year Commercial.	Third-year Technical.	Third-year Household Science.	Junior Matriculation.	Senior Matriculation.	Total.
St. Michael's	5	..	..	..	..	2	1	8
Vernon Preparatory	3	2	..	..	..	2	..	7
Victoria:								
Victoria High	..	1	..	..	..	78	..	79
St. Ann's Academy	..	1	..	..	..	3	..	4
St. George's	..	6	..	..	..	6	..	12
St. Margaret's	..	7	..	..	..	3	..	10
Sprott-Shaw	..	..	..	..	..	1	..	1
University Military	..	..	..	..	..	2	..	2
Private Study	..	..	..	..	..	12	1	13
Waldo	2	1	..	..	..	..	..	3
Westbank Townsite	5	1	..	..	..	3	..	9
	269	139	32	6	12	1,029	29	1,516

HIGH SCHOOL ENTRANCE EXAMINATION, JUNE, 1923.

Following are the names of the winners of His Excellency the Governor-General's bronze medals:—

District No. 1—Douglas E. McIntosh, Monterey Avenue School, Oak Bay.
" 2—Florence C. Olson, Waterloo.
" 3—Margaret Coope, Cecil Rhodes School, Vancouver.
" 4—Katherine M. Lehrman, General Brock School, South Vancouver
" 5—Edwin A. Verner, Port Coquitlam.
" 6—Alma M. Farenhurst, Merritt.
" 7—Gladys A. Fisher, Penticton.
" 8.—Catherine McD. Urquhart, Rossland.
" 9—Maud G. Thorpe, Nelson.
" 10—Edward McLean, Prince Rupert.

NUMBER OF SUCCESSFUL CANDIDATES AT EACH CENTRE.

Abbotsford Centre.

Abbotsford 6
Poplar 3

Agassiz Centre.

Agassiz 10

Alberni Centre.

Alberni 2
Port Alberni 5
Beaver Creek 2
Private study 1

Alert Bay Centre.

Girls' Home, Alert Bay 4

Alice Arm Centre.

Alice Arm 1

Armstrong Centre.

Armstrong 15
Falkland 1
Heywood's Corner 2
Salmon Valley 2

Arrowhead Centre.

Crawford Creek 1

Ashcroft Centre.

Ashcroft 4

Athalmer Centre.

Athalmer 1
Wilmer 1

Atlin Centre.

Discovery 1

Barkerville Centre.

Barkerville 1

Black Creek Centre.

Black Creek 1

Bradner Centre.

Aberdeen 2
Bradner 1
Jubilee 1

Bridgeport Centre.

Bridgeport 12
Lord Byng 8

Britannia Beach Centre.

Britannia Beach 1

Buckley Bay Centre.

Buckley Bay 2

Bulkley Centre.

South Bulkley 1

Burnaby Centre.

Edmonds Street 63
Gilmore Avenue 22
Kingsway West 25
Nelson Avenue 9
Schou Street 4

Burns Lake Centre.

Burns Lake 6
South Bank 1

Burton Centre.

Burtondale 3
Mount Ingersoll 2

Castlegar Centre.

Blueberry Creek 1
Castlegar 1
Robson 5

Chase Centre.

Chase 2

HIGH SCHOOL ENTRANCE EXAMINATION, JUNE, 1923—*Continued.*

Number of Successful Candidates at each Centre—*Continued.*

Chemainus Centre.

Chemainus	6
Crofton	1
North Galiano	1

Chilliwack Centre.

Chilliwack	6
Atchelitz	3
Camp Slough	3
Cheam	7
East Chilliwack	4
Fairfield Island	1
Lotbiniere	4
Robertson	9
Rosedale	11
Sardis	12
Strathcona	2
Yarrow	2
Coqualeetza Institute	2

Clearwater Centre.

Little Fort	2

Clinton Centre.

Big Bar Mountain	2
Clinton	1

Clo-oose Centre.

Clo-oose	1

Cloverdale Centre.

Cloverdale	12
Colebrook	1
East Kensington	1
Elgin	1
Kensington Prairie	1
Newton	2
Springdale	1
Strawberry Hill	2

Colwood Centre.

Albert Head	1
Colwood	3
Happy Valley	1
Langford	1

Cortes Island Centre.

Whaletown	1

Courtenay Centre.

Courtenay	12
Comox	4
Grantham	2
Headquarters	1
Merville	2

Courtenay Centre—Continued.

Nob Hill	1
Puntledge	2
Royston	1
Sandwick	2

Cranbrook Centre.

Cranbrook	12
Bull River Bridge	3
Fort Steele	3
Kimberley	2
Mayook	1
Moyie	3
Sullivan Hill	1
Wardner	3
Wattsburg	3
Wycliffe	2
Yahk	1

Creston Centre.

Creston	19
Camp Lister	2
Canyon City	2
Erickson	4
Wynndel	2

Cumberland Centre.

Cumberland	10
Bevan	1

Duncan Centre.

Duncan	18
Cowichan	2
Cowichan Lake	2
Glenora	2

Edgewood Centre.

Deer Park	1
Fire Valley	2
Renata	1

Elphinstone Bay Centre.

Elphinstone Bay	1
Wilson Creek	1

Enderby Centre.

Enderby	8
Deep Creek	1
Enderby, North	4
Grindrod	2
Mara	1

Esquimalt Centre.

Esquimalt	7

HIGH SCHOOL ENTRANCE EXAMINATION, JUNE, 1923—*Continued.*

NUMBER OF SUCCESSFUL CANDIDATES AT EACH CENTRE—*Continued.*

Fernie Centre.

Fernie	15
Coal Creek	2
Corbin	1
Crowsnest	1
Hosmer	3

Ganges Harbour Centre.

Beaver Point	2
Burgoyne Bay	4
Divide	1
Ganges Harbour	3
Retreat Cove	2
Vesuvius, North	2
Formby House	1

Golden Centre.

Castledale	1
Golden	9

Granby Bay Centre.

Granby Bay	12

Grand Forks Centre.

Grand Forks	11
Cascade	1
Fife	1

Grassy Plains Centre.

Grassy Plains	1

Greenwood Centre.

Greenwood	3
Christian Valley	1
Rock Mountain	1

Haney Centre.

Alexander Robinson	2
Haney	10

Hazelton Centre.

Hazelton	1

Hedley Centre.

Hedley	2

Hope Centre.

Concord	1
St. Elmo	1

Howe Sound Centre.

Bowen Island	1
Howe Sound	4

Huntingdon Centre.

Huntingdon	4
Upper Sumas	2

Ioco Centre.

Ioco	9

Kamloops Centre.

Kamloops	38
Beresford	1
Campbell Creek	2
Campbell Range	1
Criss Creek	1
Louis Creek	1
McLure	1
Rose Hill	1
Squam Bay	2
Vinsulla	1
St. Ann's Academy	6
Zetland	3
Private study	2

Kaslo Centre.

Kaslo	9
Cooper Creek	1
Riondel	1
Sandon	3

Kelowna Centre.

Kelowna	5
Glenmore	1
Kelowna, East	5
Mission Creek	3
Okanagan	1
Okanagan Centre	1
Okanagan, South	3
Private study	1

Keremeos Centre.

Cawston	4
Keremeos	3

Kitsumgallum Centre.

Copper City	1
Kitsumgallum	4
Pacific	3
Usk	2

Ladner Centre.

Ladner	25

Ladysmith Centre.

Ladysmith	24
Diamond Crossing	3
Extension	2

Lillooet Centre.

Lillooet	4
Seton Lake Creek	1

HIGH SCHOOL ENTRANCE EXAMINATION, JUNE, 1923—*Continued.*

Number of Successful Candidates at each Centre—*Continued.*

Loos Centre.

Loos	1

Lumby Centre.

Lumby	5

Lytton Centre.

Foster's Bar	1
Lytton	2

Malcolm Island Centre.

Kaleva	1
Malcolm Island	3
Mitchell Bay	1

Maple Ridge Centre.

Hammond	6
Maple Ridge	5

Masset Centre.

Masset	1

Matsqui Centre.

Clayburn	3
Matsqui	4
Ridgedale	3

Merritt Centre.

Merritt	16
Nicola	1

Michel Centre.

Michel	2
Michel, New	1

Mission Centre.

Hatzic	5
Mission	16
Silver Hill	1
Nicomen Island	1
Nicomen North	2

Mount Lehman Centre.

Mount Lehman	3

Murrayville Centre.

County Line	1
Langley, East	1
Langley Fort	12
Langley Prairie	3
Lochiel	3
Milner	3
Murrayville	7
Otter	2
Springbrook	3

McBride Centre.

McBride	1

Mackenzie Centre.

Noosatsum	2

Nakusp Centre.

Demars, West	2
Glenbank	3
Nakusp	4

Nanaimo Centre.

Nanaimo	29
Brechin	1
Cassidy	4
Cedar, East	1
Cedar, North	2
Cedar, South	6
Chase River	7
Grant Mine	2
Harewood	2
Nanaimo Bay	6
Northfield	1
Waterloo	1
Wellington, South	3
St. Ann's Academy	3

Naramata Centre.

Naramata	2

Nelson Centre.

Nelson City:	
Central	56
Hume	20
Fruitvale	1
Koch Siding	1
Salmo	5
Willow Point	1

New Denver Centre.

New Denver	8

New Westminster Centre.

Central	68
Lister-Kelvin	62
Richard McBride	23
Herbert Spencer	21
Hamilton Road	4
Blue Mountain	4
Millside	3
Annieville	1
South Westminster	2
Mayne Island	1
Columbian College	1
St. Ann's Academy	9

HIGH SCHOOL ENTRANCE EXAMINATION, JUNE, 1923—*Continued.*

NUMBER OF SUCCESSFUL CANDIDATES AT EACH CENTRE—*Continued.*

North Bend Centre.

Chaumox	1
North Bend	4

Notch Hill Centre.

Carlin Siding	1
Shuswap, North	1
Sorrento	2
White Lake	4

Oak Bay Centre.

Monterey Avenue	25
Willows	21

Ocean Falls Centre.

Hunter Island	1
Ocean Falls	6

Oliver Centre.

Fairview	1
Oliver	1

Oyama Centre.

Fir Valley	1
Oyama	10
Winfield	3

Parksville Centre.

Errington	3
French Creek	1
Parksville	5
Qualicum Beach	2
Red Gap	1

Peachland Centre.

Peachland	7

Penticton Centre.

Penticton	30

Point Grey Centre.

Edith Cavell	6
Kerrisdale	4
Lord Kitchener	6
David Lloyd George	10
Magee	8
Prince of Wales	19
Queen Mary	9

Port Alice Centre.

Port Alice	2

Port Coquitlam Centre.

Port Coquitlam	13
East Coquitlam	1
Essondale	3

Port Coquitlam Centre—Continued.

Glen	1
Pitt Meadows	2

Port Moody Centre.

Port Moody	13

Powell River Centre.

Myrtle Point	1
Powell River	9

Prince George Centre.

Prince George	8
Fort George South	7

Prince Rupert Centre.

Prince Rupert	46
Annunciation School	2

Princeton Centre.

Coalmont	2
Killarney	1
One Mile	1
Princeton	8

Procter Centre.

Balfour	1
Boswell	2
Harrop	1

Quesnel Centre.

Alexandria	1
Quesnel	4

Revelstoke Centre.

Revelstoke	47
Albert Canyon	1

Rolla Centre.

Pouce Coupe Central	2

Rossland Centre.

Rossland	9

Ruskin Centre.

Ruskin	2

Rutland Centre.

Ellison	3
Rutland	10

Saanich Centre.

Cedar Hill	6
Cloverdale	15
Craigflower	10
Gordon Head	6
Keating	6

HIGH SCHOOL ENTRANCE EXAMINATION, JUNE, 1923—*Continued.*

NUMBER OF SUCCESSFUL CANDIDATES AT EACH CENTRE—*Continued.*

Saanich Centre—Continued.

Model	8
McKenzie Avenue	5
Prospect Lake	1
Royal Oak	4
Saanichton	2
Saanich, West	3
Strawberryvale	3
Tillicum	16
Tolmie	14
Sooke, East	1

Salmon Arm Centre.

Salmon Arm	17
Broadview	2
Canoe, North	1
Canoe, South	1
Salmon Arm, West	3
Silver Creek	3
Tappen	2
Tappen Valley	2

Sandspit Centre.

Skidegate	1

Seymour Arm Centre.

Seymour Arm	1

Sidney Centre.

Deep Cove	2
Saanich, North	4
Sidney	12

Silverton Centre.

Silverton	3

Slocan Centre.

Slocan City	10

Smithers Centre.

Glentanna	1
Smithers	5

Sooke Centre.

Jordan River	1
Sooke	3

Stewart Centre.

Stewart	5

Summerland Centre.

Summerland	6
Meadow Valley	1

Swanson Bay Centre.

Swanson Bay	1

Telkwa Centre.

Round Lake	1
Telkwa	1

Trail Centre.

Trail	45

Union Bay Centre.

Union Bay	8

Vananda Centre.

Blubber Bay	2
Vananda	1

Vancouver Centre.

Aberdeen	10
Alexandra	19
Bayview	8
Beaconsfield	6
Central	3
Dawson	17
Charles Dickens	13
Fairview	14
Franklin	4
Simon Fraser	18
General Gordon	17
Grandview	17
Hastings	5
Henry Hudson	19
Kitsilano	8
Livingstone	8
Model	17
Mount Pleasant	17
MacDonald	4
Lord Nelson	9
Florence Nightingale	16
Cecil Rhodes	33
Lord Roberts	17
Laura Secord	8
Seymour	5
Strathcona	12
Lord Tennyson	30
Junior High	2
Christian Brothers' School	8
Eudistine School	1
Holy Rosary	10
St. Augustine's	7
St. Patrick's	13

North Vancouver Centre.

Lonsdale	12
Queen Mary	17
Ridgeway	19
Capilano	8
Lynn Valley	8
North Star	7

HIGH SCHOOL ENTRANCE EXAMINATION, JUNE, 1923—*Continued.*

NUMBER OF SUCCESSFUL CANDIDATES AT EACH CENTRE—*Continued.*

South Vancouver Centre.

Brock	11
Carleton	11
Gordon	13
Moberly	4
McBride	7
Mackenzie	8
Norquay	3
Secord	11
Selkirk	22
Sexsmith	12
Tecumseh	6
Van Horne	3
Wolfe	7

West Vancouver Centre.

West Vancouver	22

Vanderhoof Centre.

Collishaw	1
Fort Fraser	2
Fort Fraser, North	1
Nechako	1
Vanderhoof	5

Vernon Centre.

Vernon	17
Coldstream	3
Lavington	1
Okanagan Landing	3
St. Michael's	4
Preparatory	1

Victoria Centre.

Boys' Central	1
Sir James Douglas	29
Girls' Central	18
George Jay	37
Margaret Jenkins	14
North Ward	23
Oaklands	8
South Park	26
West	12
Mayne Island	1
Metchosin	2
St. Ann's Academy	15
St. Louis College	11
St. Margaret's	1
Rhodes School	3

Waldo Centre.

Jaffray	2
Waldo	4

Westbank Centre.

Glenrosa	1
Westbank	5

White Rock Centre.

Hall's Prairie	3
White Rock	8

Williams Lake Centre.

Springhouse	1
Williams Lake	1

Woodfibre Centre.

Woodfibre	1

Number of candidates examined	4,939
Number of successful candidates	2,788
Number of pupils promoted on recommendation	1,791
Total number of pupils promoted to high schools	4,579

APPENDIX B.

HIGH SCHOOL ENTRANCE EXAMINATION, JUNE, 1923.

ARITHMETIC. (Time, 2½ hours.)

Value.

9 1. (*a.*) Divide one hundred ninety thousand, twenty-six by three hundred ninety-seven.

(*b.*) Add $2486\frac{2}{3}$, $974\frac{5}{6}$, and $1897\frac{7}{8}$; then subtract the sum from 10,000.

(*c.*) Simplify $2 - \frac{7\frac{1}{9}}{9\frac{1}{7}}$.

7 2. (*a.*) $\frac{13}{24}$ of a clerk's monthly salary is $55.25. Find his monthly salary.

(*b.*) A carpenter bought a keg of nails at 4.6c. a pound. Find how many pounds are in the keg if he paid $11.50 for it.

12 3. (*a.*) A man walks at the rate of 73 metres a minute. How many kilometres can he walk in 3.9 hours?

(*b.*) The diameter of a circular racecourse is 840 yards. What is its circumference? What is its area?

10 4. (*a.*) How many times can a box containing 4 bushels 1 peck 3 quarts be filled from a bin holding 165 bushels 2 quarts?

(*b.*) If a ton of hard coal occupies 35 cubic feet, how many tons will a bin 8 feet 3 inches by 6 feet 8 inches by 17 feet 6 inches hold?

12 5. Find the total cost of the lumber required to build a plank sidewalk ½ mile long, 6 feet wide, and 2 inches thick, laid on two rows of 2″ x 6″ scantling, if the plank was bought at $30 per M. and the scantling at $36 per M.

12 6. (*a.*) If brooms are bought wholesale at $7.50 a dozen, what per cent. profit will be made by selling them at 85c. each?

(*b.*) Last year my property was assessed at $5,475 in a town where the rate of taxation was 26.8 mills on the dollar. I received a discount of 5% for prompt payment. What amount of taxes did I pay?

10 7. A field is 85 rods long and contains 34 acres. Find: (*a*) The width of the field; (*b*) the cost of fencing it at $1.65 a rod.

14 8. Through his agent at New York a Vancouver merchant bought 3,600 yards of carpet at an average price of $1.08⅓ a yard, paying a commission of 1¾%, an *ad valorem* duty of 5%, and a specific duty of 6c. The freight and other charges amounted to $120.75. At what price per yard must he sell the carpet to gain 28% on the total outlay?

14 9. (*a.*) Find the compound interest on $700 for 1 year 3 months at 6%, interest being compounded half-yearly.

(*b.*) Find the proceeds of a note for $900 drawn December 1st, 1918, for 2 months and discounted December 15th at 6%.

DRAWING. (Time, 2¼ hours.)

Value.

21 (*a.*) Select three examples of work from your drawings, as follows:—

(1.) An example of shading in pencil.

(2.) An example of colour-work.

(3.) An example of geometrical design, or scale-drawing.

30 (*b.*) Freehand drawing:—

With ruler and set-square draw an oblong 5 inches by 7 inches. In this space draw a design, using any of the following as units: Oak-leaf and acorns; maple-leaf and keys; butterflies.

25 (*c.*) Freehand object-drawing:—

Draw any group of models you have studied during the year, and add shading.

24 (*d.*) Geometrical drawing:—

Work any *three* of the following:—

(1.) Divide any line into 7 equal parts.

(2.) Draw a line AB 3 inches long, and on it construct a square. (Do not use set-squares.)

(3.) Divide the circumference of a circle into 8 equal parts. Join the points and give the name of the figure.

(4.) Draw any scalene triangle, and on a line AB 3 inches long construct a similar triangle.

(5.) On a line AB 4 inches long, make an angle at A of 75 degrees.

GEOGRAPHY. (Time, 2¼ hours.)

27 1. Draw as large as your paper will permit a map of Canada. Show on it the Province of British Columbia with its boundaries. Trace the course of each of the following rivers: Fraser, St. Lawrence, Skeena, Athabaska-Mackenzie, and Saskatchewan-Nelson. Show the main line of the C.P.R. from Montreal to Vancouver. Mark with a dot or small circle the exact position of Port Arthur, Toronto, Ottawa, St. John, Halifax, Kingston, Regina, and New Westminster.

15 2. (*a.*) Name one centre or locality in British Columbia in which each of the following industries is carried on: Halibut fishery, copper-mining, fruit-growing, dairy-farming, wood-pulp production, coal-mining, lumbering, gold-mining, salmon-packing.

(*b.*) Explain why Vancouver is an ice-free port in winter while the port of Montreal (farther south) is frozen for several weeks.

14 3. (*a.*) What is meant by "irrigation"? Name a district in British Columbia which depends to some extent upon irrigation for raising its crops.

(*b.*) Name a tropical country or district with abundant rainfall and also a tropical country or district with insufficient rainfall. Give in each case the causes that produce the abundance or lack of moisture.

18 4. (*a.*) Through what waters would a steamer pass in going from London (England) to Vancouver? Of what would its cargo probably consist?

(*b.*) Locate the following places: Singapore, the Ruhr Valley, Gibraltar, Buenos Aires, Glasgow, Chicago, Yokohama, Madras, Bristol, and Bordeaux.

Value.

14 5. Write a description either of Egypt or of South Africa under the following heads: Surface and drainage, climate, products. Locate two cities of outstanding importance in the area you describe.

12 6. On the accompanying map show in their proper places:—

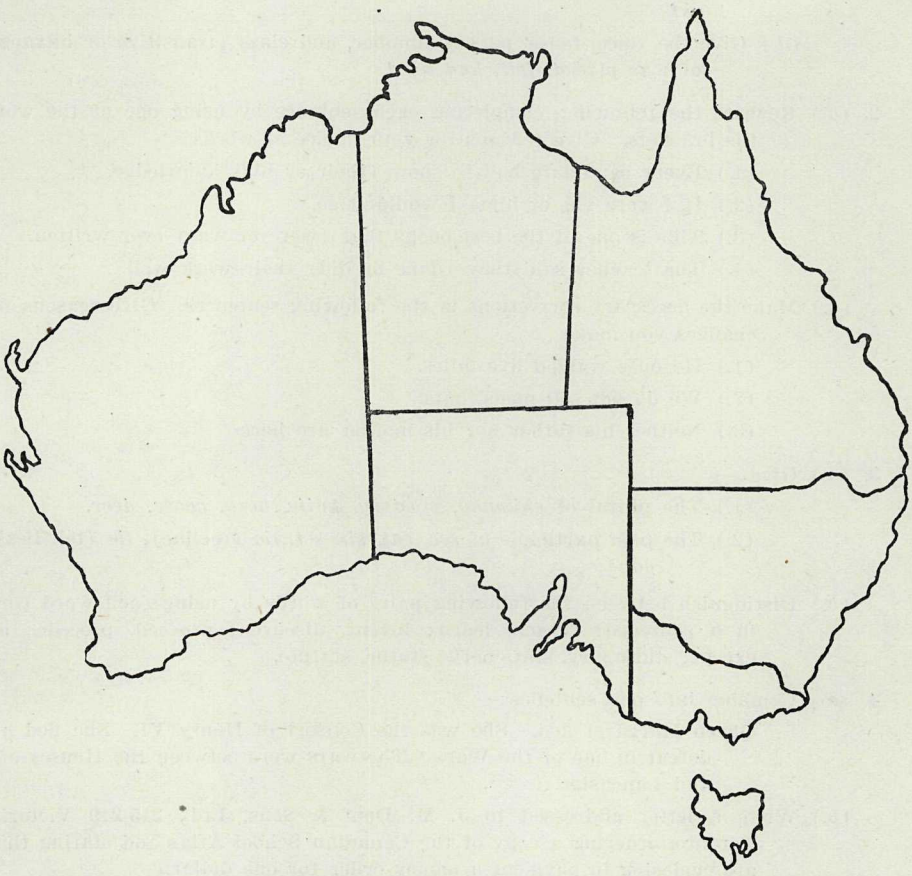
(*a.*) The six states of the Australian Commonwealth.

(*b.*) The Great Dividing Range and the Darling-Murray river system.

(*c.*) The Tropic of Capricorn.

(*d.*) Sydney, Melbourne, Hobart, Brisbane.

Candidate's No.....



NOTE.—When the candidate has finished this map he should detach it from the rest of the Geography paper and hand it in with his other answers.

GRAMMAR AND COMPOSITION. (Time, 2½ hours.)

Value.

37 1. *Because* he was *so swift* of foot he was placed five yards *behind* some of the swiftest runners *that* had been seen on *that* track.

You may imagine how I felt *when* I heard this abominable old rogue *addressing* another in the very same words of flattery as he had used to myself.

In the above sentences:—

(*a.*) What are the principal and the subordinate clauses? Give the kind and the relation of each clause.

(*b.*) What part of speech is each of the italicized words? State the relation of each word.

(*c.*) What are the cases and the relations of the words *runners, rogue, another, as?*

(*d.*) Give the voice, tense, person, number, and class (transitive or intransitive) of *was placed, felt, had used.*

14 2. (*a.*) Rewrite the following, completing each sentence by using one of the words in the brackets. Give reasons for your choice of words.

(1.) Every candidate had to show (their or his) knowledge.

(2.) If I were (he or him) I wouldn't go.

(3.) This is one of the best books that (were or was) ever written.

(4.) The teacher said they (done or did) their work well.

(*b.*) Make the necessary corrections in the following sentences. Give reasons for the changes you make.

(1.) He only walked five miles.

(2.) We do not sell mens' hats.

(3.) Neither his father nor his mother are here.

13 3. (*a.*) Give:—

(1.) The plural of *chimney, mystery, knife, hero, goose, deer.*

(2.) The past participle of *see, cat, sit, set, lie* (recline), *lie* (tell lies), *lay, go.*

(*b.*) Distinguish between the following pairs of words by using each word correctly in a sentence: Teach, learn; invent, discover; proceed, precede; accept, except; stationary, stationery; statue, statute.

16 4. (*a.*) Combine into one sentence:—

Queen Margaret fled. She was the Consort of Henry VI. She fled after a defeat in one of the Wars. The wars were between the Houses of York and Lancaster.

(*b.*) Write a letter addressed to J. M. Dent & Sons, Ltd., 215-219 Victoria St., Toronto, ordering a copy of the Canadian School Atlas and stating that you are enclosing in payment a money order for one dollar.

(*c.*) Suppose you have a musical instrument which you no longer require. Write out an advertisement offering it for sale.

20 5. Write a composition of about one page on one of the following topics:

(*a.*) The Character which you found most interesting in the Work you studied for Literature this year.

(*b.*) The Appearance, Life, and Habits of any Bird that may be found in your locality.

(*c.*) Early History of British Columbia.

PENMANSHIP AND DICTATION AND SPELLING. (Time, 1½ hours.)

(25 marks for Penmanship and 75 marks for Dictation and Spelling.)

[NOTE.—*The passages (questions A and B) are to be read slowly and distinctly to candidates three times—the first time to enable them to gather the meaning; the second time to enable them to write the words; and the third time for review. Punctuation marks should not be dictated. Candidates are not permitted to rewrite the passages.*]

Value.

24 A. Besides their freight of human beings with the necessary food and clothing, these boats carried one or two small cannon, rifles and ammunition, tools for building, blankets, knives, cloth, beads, and other merchandise for the Indian trade. Arrived at a spot suitable for the company's post—perhaps a bluff overlooking the junction of two rivers, some sheltered cove near its mouth, or a fertile plain beside a fine harbour—the men unloaded their boats and proceeded to cut down trees and erect a strong building to serve the purpose of a dwelling, storehouse, and fort. The rude furniture necessary for immediate use was made, and the piles of goods were neatly arranged.

15 B. A celebrated doctor made some interesting observations regarding the effect of tobacco on muscular exertion. He says:—

"Whenever it is desired to secure the highest possible working ability, as in athletic contests where maximum effort is demanded, all things which interfere with muscular strength are removed as far as possible. Tobacco is one of the first substances forbidden. Experiments carried out at the University of Michigan have shown that even moderate amounts of tobacco in the form of smoke lower the working power of the human muscle by a high percentage."

14 C. (1.) He gave assent to the proposal.

(2.) My cousin exclaimed, "Hear the bells peal!"

(3.) The pistil bears the seed.

(4.) The eave-trough leaks.

(5.) Does he think that the signature is genuine?

(6.) Volcanic eruptions are almost always preceded by earthquakes.

(7.) The irrigation scheme of the Canadian Pacific Railway will mean the reclamation of thousands of acres of land.

22 D. high ceiling,
forcible language,
luscious fruit,
exactly divisible,
Arctic regions,
lettuce salad,
vertical cylinder,
ninetieth avenue,
dental surgery,
porcelain saucers,
oatmeal porridge,
linen envelope,
social parasite,
bridal feast,
gorgeous plumage,
natural resources,
crippled veteran,
gross negligence,
impaired digestion,
vicious tendencies,
initial stages,
column formation.

APPENDIX C.

HIGH SCHOOL EXAMINATION, JUNE, 1923.

Preliminary Course, Junior Grade.

ENGLISH LITERATURE. (Time, 2 hours.)

Value.

5 1. (*a.*) What is a ballad? Where is the scene of the ballad *Rosabelle* laid?

5 (*b.*) What were the supernatural prodigies that preceded the death of a member of the house of St. Clair? Quote or express in your own words.

6 (*c.*) Give the meaning of the words in italics:—
(i.) To *inch* and rock the *sea-mews* fly.
(ii.) Each baron, for a sable shroud,
Sheathed in his iron *panoply.*
(iii.) Shone every pillar *foliage-bound.*
(iv.) Blazed battlement and *pinnet* high.
(v.) And seen from *caverned Hawthornden.*

11 2. Contrast the Parson in *The Deserted Village* with the Parson in *The Birds of Killingworth.*

N.B.—You may answer this question by quoting from each poem, or you may give your answer in your own words.

5 3. (*a.*) "The poem *The Ancient Mariner* has an atmosphere of great mystery." Support the above statement by giving *five* instances of the supernatural recorded in the poem.

3 (*b.*) What merits apart from its uncanny atmosphere does the poem possess?

3 (*c.*) Quote a few lines to show Coleridge's power of painting a picture in a few words.

3 (*d.*) What was the life-long penance that the Ancient Mariner had to perform in atonement for his crime?

10 4. (*a.*) Quote from *one* of the following:—
Ulysses (Tennyson), about 12 consecutive lines.
The Skylark (Shelley), 4 consecutive stanzas.
Ode to a Nightingale (Keats), 1 stanza.
The Vision of Sir Launfal (Lowell), about 12 consecutive lines.

5 (*b.*) Write a paragraph giving your reasons why we should commit poetry to memory.

10 5. "The poem *Ulysses* has helped many people to brave the struggle of life."
Do you think that this statement is true? Give reasons for your answer.

6. Tell from what poems the following selections are taken, and express the meaning of each selection in your own words:—

4 (*a.*) My dazzled sight he oft deceives,
A brother of the dancing leaves.

4 (*b.*) The voice I heard this passing night was heard
In ancient days by emperor and clown.

4 (*c.*) Low lies that house where nut-brown draughts inspired,
Where grey-beard mirth and smiling toil retired.

4 (*d.*) Not once or twice in our rough island story
The path of duty was the way to glory.

10 7. (*a.*) Describe the siege of the Round House in *Kidnapped*, paying particular attention to the character of Alan Breck as portrayed therein.

8 (*b.*) Give Alan Breck's reasons for entertaining such a deep hatred for "Red Fox."

Latin. (Time, 2 hours.)

Value.

8 1. Decline together throughout: *grave vulnus, longior dies.*

7 2. Write the ablative singular and the genitive plural of: *pons, princeps, exercitus, agmen, frater, locus, dux.*

5 3. Give the other degrees of comparison of: *malus, similis, utilis, magnus, potens.*

5 4. Give the principal parts of: *relinquo, do, gero, jubeo, video.*

18 5. Write the second person singular and the third person plural of all the tenses you have taken of the verb "*video.*" Give the English for each word in the third person plural.

5 6. Give an English word derived from each of the following Latin words: *novus, malus, summus, mille, nihil.*

20 7. Translate into English:—

(*a.*) Sed non aequum est multos amicos necare propter injurias paucorum.

(*b.*) Summa cum virtute impetum sustinuit et plurimos in fugam dedit.

(*c.*) Propter paucitatem civium videbatur facillimum esse pontem occupare et in mediam urbem exercitum ducere.

(*d.*) Animi omnium spe victoriae confirmati sunt.

(*e.*) Amicitiae causa agros finitimis concedere non dubitabis.

32 8. Translate into Latin:—

(*a.*) They had marched 23 days with 2,000 soldiers.

(*b.*) We were informed by several scouts of the king's arrival.

(*c.*) At the third hour they left the camp without a guide.

(*d.*) When all the army is posted, the signal will be given.

(*e.*) We do not fight after the withdrawal of our allies.

(*f.*) We shall demand a very large number of reinforcements from the Romans.

(*g.*) Lieutenant, you are being sent to treat for peace.

(*h.*) The middle of the island was useless to the inhabitants.

French. (Time, 2 hours.)

[N.B.—*All candidates must write Section A. Section B is for those who have studied Siepmann and Section C is for those who have studied Fraser and Squair.*]

Section A.

12 1. (*a.*) Write in the plural:—

(1.) C'est mon cheval.

(2.) Il ne porte pas son chapeau.

(3.) La chèvre mange le gros chou.

(4.) Voilà un oiseau curieux; est-il noir ou bleu?

12 (*b.*) Write in the singular:—

(1.) Commencent-ils les travaux?

(2.) Les fils de vos amis aiment ces jeux.

(3.) Regardez ces autres arbres.

(4.) Nous finissons tous nos exercices.

Value.

6 2. J'ai un livre.
Rewrite this sentence six times, using the following expressions: beaucoup, bons, assez, verts, quelques, ne . . . pas.

8 3. Substitute the noun in brackets for the italicized noun and make the necessary changes:—
(1.) Son *cheval* est vieux (vache).
(2.) Ces *gants* sont blancs (feuilles de papier).
(3.) Tous les *fruits* ne sont pas pareils (cerises).
(4.) Quels *soldats* cruels (femme).

12 4. Form sentences with the following groups of words, beginning with the present indicative of the verb, putting *à* and the definite article where necessary before the first noun and *de* and the definite article where necessary before the second:—
Model sentence—Je parle à l'enfant de M. Dubois.
répondre (first sing.) . . . lettre . . . Georges.
parler (second sing.) . . . frère . . . professeur.
donner de l'argent (third sing.) . . enfants . . . pauvre femme.
vendre du beurre (first plur.) . . . ami . . . marchand.
raconter une histoire (second plur.) . . . fille . . . homme.
arriver (third plur.) . . . portes . . . jardins.

SECTION B. (Siepmann.)

16 1. (*a.*) Write the present indicative in full of *choisir sa plume*, using the possessive adjective corresponding to the subject.
(*b.*) Write the present indicative in full of *vendre cette ferme*, replacing the noun *ferme* by the following nouns: bicyclette, arithmétique, chien, animal, poisson, gâteaux.
(*c.*) Write the imperative in full of: avoir, répondre.

24 2. Put into French:—
(1.) What is that book? It is a dictionary.
(2.) What time is it? It is a quarter to one.
(3.) The farmer has forty-one lambs and sixty-three calves.
(4.) She speaks in a low voice when her mother is ill.
(5.) They do not prevent the boys from playing in the park.
(6.) How tired I am! Let us stay here a few minutes.

10 3. Answer these questions in French:—
(1.) Combien de centimes y a-t-il dans un franc?
(2.) En quoi est un franc?
(3.) Quelle est la mauvaise habitude d'Alfred?
(4.) Que porte Victor quand il fait le docteur?
(5.) Pourquoi Lucie désobéit-elle à sa mère?

SECTION C. (Fraser and Squair.)

12 1. (*a.*) Rewrite each of the following sentences, using (1) the imperfect, (2) the past indefinite, (3) the future:—
(1.) Il me donne des leçons.
(2.) Nous sommes bien fatigués.
(3.) Vous avez là une belle fleur.
(4.) Ils perdent du temps.

Value.

8 (*b.*) Rewrite the following sentences in the imperative (second plur.) :—

(1.) Il a du courage. (2.) Je choisis mon cadeau. (3.) Je vais chez moi. (4.) Il me répond.

6 2. Substitute pronouns for the italicized words :—

(1.) Expliquez *la leçon.*

(2.) Nous parlons *à la dame.*

(3.) Il est plus grand que *Georges.*

(4.) Il ramasse *son cahier.*

(5.) Parlez-vous *aux enfants?*

(6.) Elle ne regarde pas *les fleurs.*

24 3. Translate into French :—

(1.) The dining-room is longer than your bedroom.

(2.) He is a friend whom I like very much.

(3.) Do these pens belong to your sister?

(4.) Have you found the books which you were looking for?

(5.) Are there any pretty houses in the country?

(6.) These apples which I have bought are not very sweet.

ENGLISH COMPOSITION. (Time, 2 hours.)

10 1. A classmate of yours is going to visit a relative in another city in which you have a friend. Write a letter introducing this classmate to your friend.

9 2. Explain *unity* and *coherence* as applied to the paragraph.

10 3. Correct the following sentences :—

(*a.*) I saw quite a lot of my friends at the meeting.

(*b.*) Do not answer less than four questions.

(*c.*) The house was furnished as good as you could wish.

(*d.*) Don't buy those sort of books.

(*e.*) Isn't Henry just wonderful?

11 4. Punctuate the following :—

(*a.*) Captain asked a sailor can anything be lost if you know where it is no replied the captain then said the sailor your silver teapot which has just fallen out of my hand is not lost for I know that it is at the bottom of the ocean.

(*b.*) Ribbons buttons buckles pieces of gold-lace any trifles he had worn were stored as priceless treasures.

60 5. Write an essay on *one* of the following subjects :—

(*a.*) Life in Cluny's Cage. *(Kidnapped.)*

(*b.*) Protection of Bird Life. *(The Birds of Killingworth.)*

(*c.*) Country Life: Its Advantages and Disadvantages.

ALGEBRA. (Time, 2 hours.)

Value.

10 1. (*a.*) Add together $a(a-b+c+d)$, $b(a+b-c+d)$, $c(a+b+c-d)$, $d(-a+b+c+d)$.

(*b.*) From $\frac{a+b}{2}$ take $\frac{a-b}{2}$.

16 2. (*a.*) Multiply $4x^3-11x+2-3x^2$ by $2x^2-5x+9$.

(*b.*) Divide $6a^5-14a^2-25+10a^3-a^4$ by $3a^2+5+4a$.

24 3. Solve the following equations :—

(*a.*) $\frac{1}{5}(2x+11)-\frac{1}{2}(5-6x)=7x+1\frac{1}{2}$.

(*b.*) $\frac{2}{x}-\frac{3}{y}=3$; $\frac{5}{x}+\frac{6}{y}=48$.

(*c.*) $x+y+z=18$; $x-y+z=12$; $x+y-z=6$.

10 4. Simplify by removal of brackets :—

$$84-7\left[-11x-4\left\{-17x+3(5x-1)\right\}\right].$$

10 5. Find Square Root of $4x^2-12x+5+\frac{6}{x}+\frac{1}{x^2}$.

18 6. (*a.*) If a man walks *4* miles *an hour*, how many miles will he go in x minutes? How many minutes will it take him to go x yards?

(*b.*) One flock of sheep consists of 10 sheep more than the half of another flock. The two flocks together contain 91 sheep. How many in each flock?

12 7. If $v=u+ft$ and $v^2=u^2+2fs$:—

(*a.*) Find t in terms of v, u, and f.

(*b.*) Find s in terms of v, u, and f.

(*c.*) Find numerical value of v and s when $u=20$, $t=4$, $f=-2$.

PHYSICS AND CHEMISTRY. (Time, 2 hours.)

[*All questions are of equal value.*]

1. Describe the chemical hygrometer and show how it is used to measure the water vapor in the air. When does air feel dry? When does it feel damp?

2. What are convection currents? Show how convection currents in water are used for the heating of buildings. Of what use are convection currents in ventilation? Use diagrams.

3. Describe an experiment to illustrate the principle of the balance and give a sketch of the things you use.

4. How would you proceed to prepare oxygen gas? What are its properties?

5. In what proportions, by mass, do hydrogen and oxygen exist in water? How would you go to work to find this out for yourself? Give a sketch of any apparatus you would use.

6. Give an account of the balance of nature and of the uses of plants in this connection.

7. What is the cause of hardness in water? How may it be removed?

GENERAL SCIENCE. (Time, 2 hours.)

[*All questions are of equal value. Answer* seven *only.*]

1. (*a.*) Name three modern mechanical devices in common use which utilize compressed air.
   (*b.*) What properties of compressed air make it useful in these appliances?

2. (*a.*) Give approximately the length of a metre in inches and tell what is meant by cubic centimetre, gram, and litre.
   (*b.*) Show by diagram the construction of an "air thermometer," and explain its action.

3. (*a.*) How would you determine the direction of air-currents in a room?
   (*b.*) What movement in air-currents is set up when you open an outside door leading into a warm room? Give the reason for this movement.

4. Explain the heating of the water in a hot-water tank which is connected with the fire-box of a kitchen range or burner.

   Make a drawing of *one* of the following to illustrate your answer:—
   (1.) The above mentioned hot-water tank and connections.
   (2.) A piece of apparatus which you would use in the laboratory to illustrate this system of heating.

   Use arrows to indicate the movement of the water.

5. (*a.*) Describe an experiment to show that the sense of feeling is not reliable as a means of estimating temperature.
   (*b.*) Change the following Centigrade readings to Fahrenheit:—
   -40° C.; -6° C.; 12° C.; 50° C.

6. Tell what you know of carbon dioxide under the following headings:—
   (*a.*) Its composition. (*b.*) Its production, naturally and artificially. (*c.*) Its injurious qualities. (*d.*) Its main uses. (*e.*) Method of identifying it.

7. "All plants which have chlorophyll are able to manufacture their own food."
   (*a.*) Elaborate and explain just what is meant by this statement.
   (*b.*) Name a plant that has no chlorophyll and mention a characteristic by which any one might recognize it. How does it get its food?

8. (*a.*) How do bacteria multiply and at what rate?
   (*b.*) How can this process of multiplication be retarded without destroying the bacteria?
   (*c.*) Relate your answer to (*b*) to the best method you can recommend for the keeping of uncooked food, such as milk, fruit, or meat.

9. (*a.*) Tell how to get distilled water. Illustrate your answer by means of a drawing. How does distilled water differ from clean water taken from a well?
   (*b.*) What is the difference between organic and inorganic impurities in water? Which do you consider the more dangerous? What would you do with impure water to render it safe for drinking purposes?

10. Discuss the formation of soil under the following heads:—
    (*a.*) Substances from which soil is formed. (*b.*) Agencies that operate in its formation. (*c.*) Meaning of the following terms: clay loam, sandy loam, peaty soil, silt, humus.

11. (*a.*) What food materials do plants get (1) from the soil, (2) from the air?
    (*b.*) Name and explain the process by which plants take their food from the soil.

GEOMETRY. (Time, 2½ hours.)

Value.

15 1. (*a.*) If a straight line cuts two other straight lines so as to make the alternate angles equal, then these two straight lines are parallel.

(*b.*) Under what other conditions would these two straight lines be parallel?

14 2. Prove that the three angles of a triangle are together equal to two right angles.

12 3. From which of the conditions given below may we conclude that the triangles ABC, A′B′C′ are identically equal? Give the reason for your decision in each case.

(i.) $A=A'=80°$
$B=B'=40°$
$a=a'=4$ cm.

(ii.) $a=a'=4$ cm.
$b=b'=2$ cm.
$C=C'=80°$

(iii.) $A=A'=35°$
$B=B'=120°$
$C=C'=25°$

(iv.) $a=a'=3$ cm.
$b=b'=4$ cm.
$c=c'=5$ cm.

(v.) $B=B'=55°$
$b=b'=5$ cm.
$c=c'=6$ cm.

(vi.) $C=C'=90°$
$c=c'=13$ cm.
$a=a'=5$ cm.

14 4. Any two sides of a triangle are together greater than the third side.

15 5. A is the vertex of an isosceles triangle ABC and BA is produced to D so that AD is equal to BA; if DC is drawn, show that BCD is a right angle.

15 6. In a straight line XY find a point which is equidistant from two given points A and B on the same side of XY. (State your construction and give a theoretical proof.)

15 7. If in a quadrilateral the greatest and least sides are opposite to one another, then each of the angles adjacent to the least side is greater than its opposite angle.

CIVICS. (Time, 1½ hours.)

[*Questions are of equal value. Answer* four *only.*]

1. (*a.*) What authority has the Provincial Government over public and high schools?
   (*b.*) Name the chief duties of a school board.
   (*c.*) Why is education essential in a democratic country?

2. (*a.*) Explain the difference between *direct* and *indirect* taxation and give two examples of each.
   (*b.*) Name *five* ways in which the money that is raised by the Federal Government in taxes is spent.

3. (*a.*) Give the qualifications of a voter in a British Columbia provincial election.
   (*b.*) Draw a diagram of a ballot-paper and show how it should be marked.
   (*c.*) Explain how the ballot-paper may be spoiled.

4. (*a.*) Tell under which of the three governments—federal, provincial, municipal—you would place the following items:—

   Lighthouses; Customs duties; immigration; public parks; administering criminal law; constructing roads; post-offices; bridges; supervision of Fruit-growers' Association; banks; forest preservation; dog-tax.

   (*b.*) Name four departments of the British Columbia provincial government.

5. (*a.*) Give the name of each of the following:—
   (1.) The Premier of British Columbia.
   (2.) The Prime Minister of Canada.
   (3.) The Lieutenant-Governor of British Columbia.
   (4.) The Governor-General of Canada.
   (5.) The Prime Minister of Great Britain.

   (*b.*) Write a paragraph on *one* of the following topics:—
   (1.) The present situation in the Ruhr Valley.
   (2.) Recent explorations in Egypt.
   (3.) The Lausanne Conference.

ARITHMETIC. (Time, 2 hours.)

[*All questions are of equal value. Answer* eight *only.*]

1. (*a.*) Add: 3.75; 375; .375; 37.5
   (*b.*) From 37.5 take 3.75.
   (*c.*) Multiply .2 by .05.
   (*d.*) Divide .075 by 25.

2. Express 3.4 metres as centimetres; as kilometres. Give the English equivalent of metre, kilometre, litre, gram.

3. The longitude of Halifax is 63° west and that of Victoria is 123° west. When it is 9.30 a.m. (standard time) in Victoria, what is the time in Halifax?

4. A man drew 65% of his money from a bank and with 40% of this bought a house and lot for $5,200. How much money had he remaining in the bank?

5. A clothier is offered 400 suits of ready-made clothing at $18 a suit, less 20% and 5% by A, and at $16 a suit, less 10%, by B. If he buys from A, the clothier pays the freight, $4.50. B offers to pay the freight. Which is the better offer and by how much?

6. A sewing-machine catalogued at $40 is sold to a merchant subject to a discount of 25% and 20%. The merchant marks it at a certain price, but before selling it he gives discounts of 25% and 20%. He gains 25%. Find his marked price.

7. A person invests $750 at simple interest and at the end of 3 years and 8 months he finds that he possesses $956.25. What rate per cent. per annum did his money yield?

8. A young man had $1,600 saved. He purchased a house and lot for $4,000, borrowing $2,400 at a bank, giving as security a mortgage on the house and lot. The house rented for $37.50 a month. He paid 5½% interest on the mortgage; ⅛% premium on an insurance policy of $3,000; 18 mills tax on a valuation of $3,500; $14 per year for water; $50 for repairs. What rate of interest did he receive on his investment?

9. What will a banker retain on discounting a note of $1,275 drawn on the 4th of March, at 10 months and discounted on August 14th at 5%?

10. A merchant began business with a certain capital. He gained 5% each year he was in business and at the end of 3 years he was worth $18,522. With what capital did he begin business provided he added his gain to his capital each year?

DRAWING. (Time, 2 hours.)

(a.) Selections from Drawings.

[*Time taken to collect these drawings is not to be deducted from the two hours allowed for this paper.*]

Select the following from your drawing-books and write your distinguishing number at the top right-hand corner of each. Before beginning your drawing give these to the Examiner.

Value.

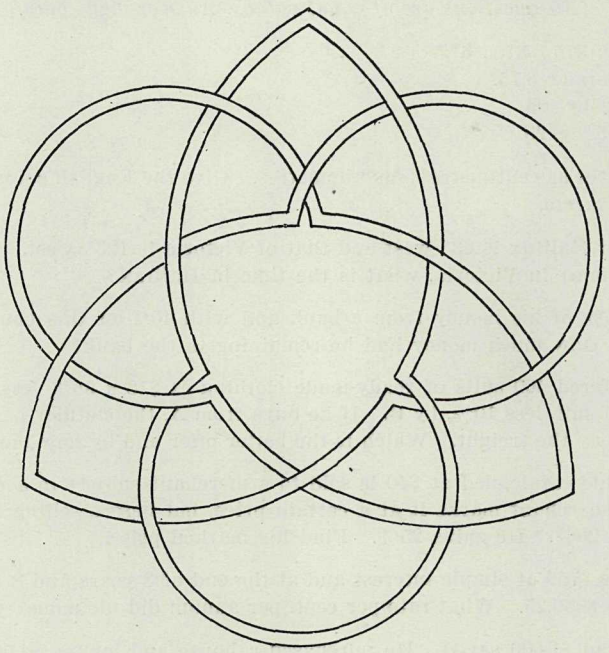
7 1. An example of freehand design.

7 2. An example of brush-drawing in colour from nature.

6 3. An example of shaded object-drawing.

(b.) Geometrical.

15 Copy the given geometrical pattern, making your copy about 6 inches wide.



(c.) Freehand Drawing and Design.

33 Using the accompanying cut, representing a sprig of wild-rose bush, as your motif or source from which to derive ornamental forms, design *one* of the following projects:—

(1.) A book-cover 5¾ by 8¼ inches for a new edition of The Arabian Nights.

(2.) An inlaid wooden panel to decorate the top of a box 8¼ inches square.

(3.) An embroidered handbag 8¼ inches wide.

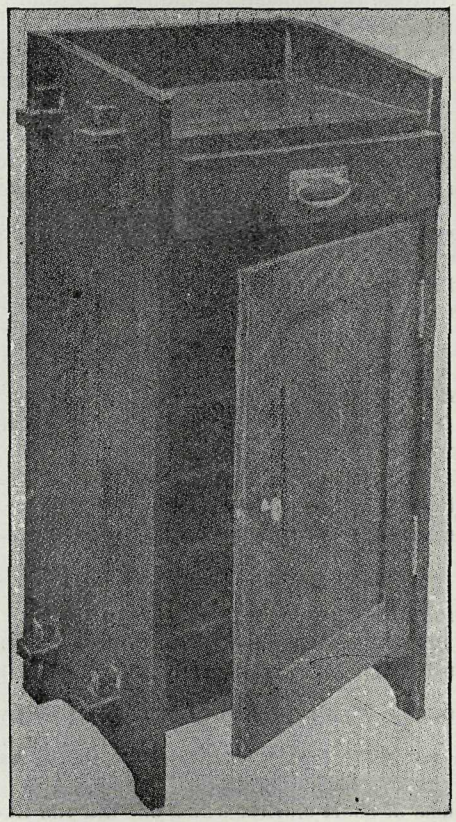
Choose your ornamental forms from the accompanying illustration. You are at liberty to use the geometrical figure given in (*b*) as the basis of your design.

It should be remembered that natural forms are generally unsuitable for the purpose of design.

Value.

(d.) Object Drawing.

32 Reproduce, by means of a freehand, shaded, pencil drawing, the accompanying cut. Your drawing should be at least 6 inches high.



Advanced Course, Junior Grade.

ENGLISH LITERATURE. (Time, 2 hours.)

[*Candidates will answer Section A and any* two *of Sections B, C, D.*]

SECTION A. LONGER NARRATIVE POEMS.

Value.

4 1. (*a.*) What is the theme or subject of the poem *Christabel?*

5 (*b.*) In the following selection mark the words or syllables on which the accent falls:—

"'Tis the middle of the night by the castle clock,
And the owls have awakened the crowing cock,
Tu-whit! Tu-whoo!
And hark, again! the crowing cock,
How drowsily it crew."

6 (*c.*) Select *two* short passages from the poem, that, because of beauty of description or musical flow, have made a strong appeal to your emotions.

10 2. (*a.*) In the poem *Sohrab and Rustum* we are presented with a number of highly picturesque scenes glowing with light and colour.
Write a short description of *one* of these scenes.

5 (*b.*) What reasons had Rustum for not desiring a combat with Sohrab?

5 (*c.*) What was the direct cause of Sohrab's defeat?

3. Answer any *three* of the following:—

5 (*a.*) Give the main arguments which Goldsmith advances in defence of the rights of Britain's peasantry.

5 (*b.*) What virtues, in Goldsmith's opinion, live and thrive among a simple and happy peasant people?

5 (*c.*) Give the substance of Goldsmith's address to poetry beginning:—
"And thou, sweet Poetry, thou loveliest maid—"
What figure of speech does the poet use throughout this address?

5 (*d.*) Give a short character sketch of the Schoolmaster in *The Deserted Village.*

5 (*e.*) How does Goldsmith's treatment of this character differ from Whittier's treatment of a similar character in *Snow-Bound?*

10 4. Quote twelve consecutive lines from *one* of the following:—
(*a.*) *The Deserted Village.*
(*b.*) *Snow-Bound.*
(*c.*) *Sohrab and Rustum.*

SECTION B. JULIUS CAESAR.

Answer any *two* of the following:—

10 (*a.*) Write a paragraph on the difference in character between Calpurnia and Portia.

10 (*b.*) Give in your own words the substance of Marc Antony's speech to the citizens on the occasion of Caesar's death.

10 (*c.*) What qualities did Brutus lack as a public speaker?

SECTION C. QUENTIN DURWARD.

Give a brief account of:—

10 (*a.*) The first meeting of Quentin Durward and King Louis.

10 (*b.*) The Boar Hunt.

SECTION D. SPECIMENS OF THE SHORT STORY.

10 (*a.*) Set forth, in not more than a page, the train of reasoning that led Dupin to discover the Purloined Letter.

10 (*b.*) Of the specimens of short stories, which *one* did you like best, and why?

Latin. (Time, 2 hours.)

Value.

8 1. Decline: *tu, idem* (neuter only), *grave vulnus.*

7 2. Compare: *malus, bene, facilis, celer, utilis, acriter, prope.*

10 3. Give the following verb forms:—

(*a.*) Second singular present indicative passive of *fero.*

(*b.*) Second plural imperfect subjunctive of *fio.*

(*c.*) Third plural perfect indicative of *absum.*

(*d.*) First plural future indicative passive of *vulnero.*

(*e.*) First plural imperfect subjunctive of *ineo.*

(*f.*) Second singular present subjunctive passive of *gero.*

(*g.*) Second plural perfect subjunctive active of *redeo.*

(*h.*) First plural pluperfect subjunctive of *desum.*

(*i.*) Second singular present subjunctive of *nolo.*

(*j.*) Third plural future indicative of *possum.*

10 4. Write the principal parts of: *dejicio, persuadeo, volo, praesto, confero, occurro, coorior, sentio, progredior, vereor.*

10 5. Give the Latin for: according to custom; on guard; to wheel about; to suffer loss; on one side; by common consent; to be very strong; at the beginning of summer; to be of service; just before dawn.

32 6. Translate into Latin:—

(*a.*) When he left the town, he said he would return as quickly as possible.

(*b.*) He does not say why he wishes to do this.

(*c.*) They will urge us to follow them.

(*d.*) He thinks that the men whom he is sending will soon arrive there.

(*e.*) He left two thousand men to guard the camp.

(*f.*) Learning their plan, he sets out to lay waste the fields.

(*g.*) Outposts should be stationed lest a sally be suddenly made.

(*h.*) He learned that this island, Britain by name, was smaller than Gaul, but that the Britons were equal to the Gauls in number.

12 7. Translate into English:—

Dum haec in colloquiō geruntur, Caesarī nūntiātum est equitēs Ariovistī propius accēdere, et lapidēs tēlaque in nostrōs conjicere. Caesar loquendī fīnem fēcit, sēque ad suōs recēpit, suīsque imperāvit, nē quod omnīnō tēlum in hostēs *rejicerent,* nē pulsī hostēs dīcere *possent* sē in colloquiō per īnsidiās circumventōs. Quibus rēbus cōgnitīs, multō mājus studium pūgnandī exercituī injectum est.

(*a.*) Explain the subjunctives *rejicerent, possent.*

11 8. Translate into English:—

Ille respondit sē graviter vulnerātum esse; cum tamen cēterī *quaesīvissent* quis eī vulnus *intulisset,* respondit ille Nēminem id fēcisse. Quibus rēbus audītis, ūnus ē Cyclōpibus dīxit: "Sī nēmō tē vulnerāvit, appāret cōnsiliō deōrum, quibus resistere nec possumus nec volumus, hōc suppliciō tē afficī." Hīs rēbus dictīs, discessērunt Cyclōpēs, eum in insāniam incidisse arbitratī.

(*a.*) Explain the subjunctives *quaesīvissent, intulisset.*

FRENCH. (Time, 2 hours.)

[N.B.—*All candidates must write Sections A and D. Section B is for those who have studied Siepmann and Section C is for those who have studied Fraser and Squair.*]

Value.

SECTION A.

10 1. Rewrite in the plural:—

(1.) C'est un nouvel ami.
(2.) Un autre bateau s'approcha.
(3.) Ce journal français.
(4.) Mon vieux pardessus.
(5.) Leur château curieux.

10 2. Rewrite, substituting pronouns for the italicized words:—

(1.) Pourquoi n'a-t-il pas donné de l'argent *aux pauvres?*
(2.) Êtes-vous *à l'école?*
(3.) Avez-vous visité *les églises?*
(4.) Qui est chez *Marie?*
(5.) Donnez cette pomme *à votre soeur.*
(6.) Ne ramassez pas *le crayon.*
(7.) Il vend *du beurre* au marché.
(8.) Vous et *Georges* êtes de mon avis.
(9.) J'arrive toujours avant *mes frères.*

4 3. (*a.*) Supply suitable relative pronouns:—

(1.) Voici l'homme . . . je vous ai parlé.
(2.) Où est la ferme . . . il vous a vendue?
(3.) Quels sont les enfants avec . . . vous jouez?
(4.) J'ai oublié le livre dans . . . j'avais caché la lettre.

8 (*b.*) Translate into French:—

Their book and ours. Her houses and his. Your bicycle and mine. Our garden is near theirs.

12 4. Rewrite each of the following sentences (*a*) in the imperative (second plur.), (*b*) in the past indefinite (third plur.), (*c*) in the future interrogative (third sing.):—

(1.) Vous êtes agréables.
(2.) Je ne les remplis pas.
(3.) Il la vend.
(4.) Vous avez toujours de l'argent.

SECTION B. (Siepmann.)

12 1. Translate into French:—

(1.) Is this book yours?
(2.) How slow she is!
(3.) What an ugly animal!
(4.) What are you looking at?
(5.) To whom is he speaking?
(6.) They have not enough paper.

Value.

24 2. Translate into French:—

(1.) At what time will he be here? At half-past four.

(2.) I often used to think of the old farm.

(3.) His presents are as beautiful as last year but they are not so numerous.

(4.) He will leave for France as soon as his father arrives.

(5.) If the captain noticed the boys he would speak to them.

(6.) Selfish people are the most unhappy of all.

Section C. (Fraser and Squair.)

12 1. Translate into French:—

(1.) It is fine to-day.

(2.) No one has come.

(3.) What is on the table?

(4.) Is this book yours?

(5.) It is half-past six.

(6.) I am glad to see you.

24 2. Translate into French:—

(1.) I arrived at New York on the sixteenth of July.

(2.) The gloves which I have bought are smaller than these.

(3.) Is it in this house that you used to live?

(4.) They have no more bread; let us give them some.

(5.) When the house is ready, we shall live in it.

(6.) We intend to go to Europe next summer.

Section D.

20 Translate:—

(1.) Nous avons perdu de vue Monmouth au moment où précipité du haut du pont Notre Dame, il se débattait dans les flots. Par bonheur pour lui, les piles de l'arche principale avaient un rebord assez large, auquel il put s'accrocher. De là il promena ses regards autour de lui. La Seine lui parut un océan sans bornes; il crut au-dessus de ses forces de la traverser. Il préfera donc demeurer à sa place au risque d'y périr de faim ou de froid, et attendit les événements avec résignation.

(2.) L'aventure des sieurs Croquemouche et Guignolet s'était répandue parmi les mariniers; Faribole l'apprit de l'un d'eux et découvrit un témoin qui avait vu Lustucru jeter le chat du haut du pont Notre Dame. Le maître d'hôtel, confondu, n'attendit pas qu' on le congédiât; il s'enfuit, et pour éviter la vengeance de Madame de la Grenouillère, il s'embarqua en qualité de cuisinier sur un navire marchand qui partait pour l'Océanie.

English Composition. (Time, 2 hours.)

8 1. Correct the following sentences; give your reason for correction in each case:—

(*a.*) It is best to truly say what one thinks.

(*b.*) I shall try and learn the lesson.

(*c.*) This dress is equally as pretty.

(*d.*) Each of the boys had gone quietly to their own homes.

8 2. What do you understand by the terms *coherence* and *transition* as applied to the paragraph?

Value.

9 3. Combine into longer sentences the thoughts that are closely related in the following:—

A piece of money was lying in the road. A young man picked it up. He hoped to find another. He kept his eyes fixed steadily on the ground. He did this always afterwards in walking along the street. He did pick up a good amount of gold and silver. This was in the course of a long life. He was looking for money all the time. The heavens were bright above him. Nature was beautiful around him. He did not see them. He never looked up from the mud and filth. He sought treasure in them. He died a rich old man. He knew this fair earth, even up to his death, only as a dirty road. He thought it was to pick up money from.

75 4. Write an essay on *one* of the following subjects:—

(*a.*) My Favourite Hobby.

(*b.*) The Combat between Sohrab and Rustum.

(*c.*) Ernest (*The Great Stone Face*).

ALGEBRA. (Time, 2 hours).

13 1. Solve:—

(1.) $\cdot 3x + \cdot 7x = 1.$

(2.) $\dfrac{3x-1}{5} - \dfrac{2x-7}{3} = 9 - \dfrac{11x-67}{15}.$

(3.) $\begin{cases} \dfrac{x+y}{5} = \dfrac{x-y}{3}. \\ \dfrac{x}{2} = y + 2. \end{cases}$

15 2. Give the factors of:—

(*a.*) $x^3 + xy - x^2 - y.$

(*b.*) $a^2 + 2bc - b^2 - c^2.$

(*c.*) $x^6 - 27y^3.$

(*d.*) $p^2q^2 + s^2r^2 - p^2r^2 - q^2s^2.$

(*e.*) $x^4 + 4y^4.$

14 3. (*a.*) Express, in factors, the square root of:—

$$(2x^2 + xy - 3y^2)(2x^2 - 5xy + 3y^2)(4x^2 - 9y^2).$$

(*b.*) Express, in factors, the L.C.M. of $2x^2 + xy - 3y^2$; $2x^2 - 5xy + 3y^2$; $4x^2 - 9y^2$.

12 4. Find the value of:—

$$\frac{\dfrac{x}{y} + 5 + \dfrac{6y}{x}}{\dfrac{x}{y} - 4 - \dfrac{21y}{x}} + \frac{1}{1 + \dfrac{9y}{x - 16y}}.$$

12 5. Find the H.C.F. of $2x^3 + 4x^2 - 7x - 14$ and $6x^3 - 10x^2 - 21x + 35$.

12 6. Find the square root of $9x^6 - 12x^5 + 10x^4 - 28x^3 + 17x^2 - 8x + 16$.

10 7. The area of a certain square field is k square rods. What is the area of a second field 10 rods longer and 10 rods narrower than the square field?

12 8. (*a.*) By what quantity does $x + 42$ exceed $2x - 7$?

(*b.*) If m bushels of wheat cost d dollars, what will n bushels cost?

(*c.*) How long will it take x men to pick y boxes of strawberries if each man can pick z boxes per day?

(*d.*) The sum of two numbers is k, and their difference is 7. What are the numbers?

Botany. (Time, 2 hours.)

[All questions are of equal value.]

1. Give two examples of each of the following and describe the special structures in each case, showing how these structures are useful:—
   (*a.*) Wind-pollinated flowers.
   (*b.*) Insect-pollinated flowers.
   (*c.*) Flowers which insure cross-pollination.
   (*d.*) Fruits carried by the wind.
   (*e.*) Seeds carried by the wind.
   (*f.*) Bulbs.
   (*g.*) Tubers.

2. Make a diagrammatic drawing in longitudinal section of the flower of a plant belonging to each of the following families: (*a*) Ranunculaceæ; (*b*) Rosaceæ; (*c*) Compositæ. Label the parts and describe briefly.

3. Describe simple experiments to illustrate osmosis and transpiration.

4. Name at least four plants belonging either to bogs *or* to dry hillsides. How are these plants related to their habitat?

Geometry. (Time, 2½ hours.)

Value.

15 1. If two triangles have two angles of the one equal two angles of the other, each to each, and any side of the first equal to the corresponding side of the other, the triangles are equal in all respects.

14 2. Prove that parallelograms on the same base and between the same parallels are equal in area.

14 3. Bisect a parallelogram by a straight line drawn through a given point outside the parallelogram. State your construction and give a theoretical proof.

15 4. If the square described on one side of a triangle is equal to the sum of the squares described on the other two sides, then the angle contained by these two sides is a right angle.

12 5. What do you understand by the term "Locus"?
   What are the following Loci?—
   (*a.*) The Locus of a point which moves so that it is always equidistant from two fixed points.
   (*b.*) The Locus of a point which moves so that its distance from a fixed point is constant.
   (*c.*) The Locus of a point which moves so that its distance from a given straight line is constant.
   (*d.*) The Locus of a point which moves so that it is always equidistant from two given intersecting straight lines.
   (*e.*) The Locus of vertices of triangles on the same base and having a constant area.

15 6. If the middle points of adjacent sides of any quadrilateral are joined, the figure thus formed is a parallelogram.

15 7. ABC is a given triangle and X a given point outside the triangle. Draw a triangle equal in area to ABC having its vertex at X, and its base in the same straight line as BC. State your construction and give a theoretical proof.

CHEMISTRY. (Time, 2 hours.)

Value.

14 1. Describe clearly one method for the preparation of nitrogen. Tell what you know of its properties and uses.

14 2. Give an experiment to show the proportions by weight in which hydrogen and oxygen combine to form water.

14 3. State the law of multiple proportions. Give examples and show clearly how the examples illustrate the law.

15 4. Write equations representing the chemical action when the following substances are heated in air or in oxygen:—

(*a.*) Iron.

(*b.*) Zinc.

(*c.*) Tin.

(*d.*) Mercury.

(*e.*) Phosphorus.

14 5. Describe one method for the preparation of hydrogen chloride. What are the properties of this substance?

14 6. Compare the properties of carbon dioxide with those of carbon monoxide.

15 7. What do you understand by the following terms: Methane series, allotropes, saturated solution, metals, chemical elements?

PHYSICS. (Time, 2 hours.)

16 1. State Pascal's Law. Sketch and describe any appliance in which direct use is made of this principle.

20 2. (*a.*) Describe two methods of finding the density of a liquid.

(*b.*) A specific-gravity bottle, filled with water, weighed 39.74 grams. Some iron nails weighing 8.5 grams were introduced, and the bottle filled with water. The bottle and contents now weighed 47.12 grams. Find the density of the iron.

18 3. Explain the action of the force-pump. How high can sulphuric acid be raised by a common lift-pump when the mercury barometer stands at 27 inches, the specific gravity of sulphuric acid being 1.8 and that of mercury 13.6?

18 4. How would you determine the temperature of the maximum density of water?

10 5. Explain each of the following terms: Dew-point, relative humidity, specific heat, coefficient of linear expansion, fundamental unit.

18 6. (*a.*) Explain the expression *heat of fusion of ice.*

(*b.*) A mass of iron weighing 5,000 grams is taken from a furnace and placed on a block of ice at 0° C. It is found that 5,650 grams of ice are melted. What was the temperature of the furnace? (The specific heat of iron is .113.)

18 7. What is heat of vaporization? Tell how it is found in the case of water.

[*Answer* either *6* or *7*.]

AGRICULTURE. (Time, 2 hours.)

[*All questions are of equal value. Answer* six *only.*]

1. Give briefly the chief requisites of a fertile soil under the following headings:—
   (*a.*) Physical properties.
   (*b.*) Chemical properties.
   (*c.*) Biological properties.

2. (*a.*) Name three forms of soil water and briefly describe each.
   (*b.*) How might need of drainage be indicated?
   (*c.*) What are the chief values of drainage?

3. (*a.*) You have just purchased a sod field or lot in which you hope to have a good garden next summer. Outline your procedure by months in regard to preparation for planting May 1st, 1924.
   (*b.*) Name the crops and the special variety of each that you purpose growing. Where possible give reasons for choosing those crops and special varieties.

4. (*a.*) Describe how you would get new plants for setting out from mature plants of any *three* of the following: Strawberries, currants, raspberries, loganberries.
   (*b.*) Name two varieties of each of the first three above-mentioned fruits.

5. (*a.*) Name and give the life-history of three insect pests commonly found in the gardens of your district.
   (*b.*) Give in detail a method of destroying or controlling each of these pests.

6. Give full instructions for the selection and growing of potatoes under the following heads:—
   (*a.*) Choice of soil, and its preparation for an early crop.
   (*b.*) Variety to choose and how to prepare the seed.
   (*c.*) Planting.
   (*d.*) Subsequent care and cultivation.

7. You are given a broody hen and a setting of eggs. Outline, in detail, your procedure until the chicks are a week old.

8. Write the life-history of a honey-bee as if told by itself. Make the story interesting as well as instructive.

University Matriculation, Junior.

HISTORY. (Time, 2 hours.)

[*Four questions to be answered.*]

Value.

25 1. Write a brief account of the chief contributions Egypt has made to world civilization.

25 2. Sketch the character and achievements of Pericles.

3. Discuss the influence upon medieval civilization of:—
   15 (*a.*) The Roman Empire after the triumph of Christianity.
   10 (*b.*) The Barbarians.

25 4. In what respects did the Protestant Reformation in Germany differ from that in England?

25 5. Compare Oliver Cromwell and Louis XIV. as rulers of their respective countries.

ENGLISH LITERATURE. (Time, 2 hours.)

[*Candidates will write on Part A and* either *Part B* or *Part C.*]

PART A.

Value.

16 1. Explain, as fully as you can in a page or a page and a half, what is meant by the term "Romantic Revival."
Discuss Shelley's claim to be called a "poet of the Romantic Revival."

20 2. Quote, from Tennyson, about 15 consecutive lines that you consider good.
Show the metre of these lines.
Tell, as fully and precisely as you can, your reasons for pronouncing them good.
Point out, in these lines, some qualities that are characteristic of Tennyson's style and subject-matter.

14 3. Write on *two* of the following topics:—
(*a.*) The education of Wordsworth's Lucy.
(*b.*) The medieval atmosphere of *The Eve of St. Agnes.*
(*c.*) The mixture of good and evil in Andrea del Sarto.

PART B.

15 1. Discuss Shylock from three points of view:—
(*a.*) As a comic character.
(*b.*) As the "villain" of the play.
(*c.*) As a character who claims our sympathy.

15 2. What character is referred to in each of the following excerpts? Do you think that the characterizations are just and correct? Support your answer with evidence.
(*a.*) "—— speaks an infinite deal of nothing, more than any man in Venice."
(*b.*) "The patch is kind enough, but . . . snail-slow in profit.."
(*c.*) "The dearest friend to me, the kindest man,
The best-condition'd and unweari'd spirit
In doing courtesies."

20 3. Under what circumstances was the following speech uttered? Show its fitness to the character who uttered it. Explain, or comment on, the words and phrases italicized.

You see me, Lord Bassanio, where I stand,
Such as I am: though for myself alone
I would not be ambitious in my wish,
To wish myself much better; yet, for you
I would be trebled twenty times myself;
A thousand times more fair, ten thousand times more rich;
That only to stand high in your account,
I might in virtues, beauties, *livings*, friends,
Exceed account: but the full sum of me
Is *sum of—something*, which, *to term in gross.*
Is an unlesson'd girl, unschool'd, *unpractis'd:*
Happy in this, she is not yet so old
But she may learn; happier than this,
She is not bred so dull but she can learn;
Happiest of all is, that her gentle spirit
Commits itself to yours to be directed,
As from her lord, her governor, her king.
Myself, and what is mine, to you and yours
Is now converted: but now I was the lord

Value.

Of this fair mansion, master of my servants,
Queen o'er myself; and *even now, but now,*
This house, these servants, and this same myself
Are yours, my lord.

Part C.

15 1. Set forth at least *three* views of warfare and fighting that may be gathered from a reading of *Henry V.*

15 2. What character is referred to in each of the following excerpts? Do you think that the characterizations are just and correct? Support your answer with evidence.

(*a.*) "A good old commander, and a most kind gentleman."

(*b.*) "I did never know so full a voice with so empty a heart."

(*c.*) "valiant,
And, touched with choler, hot as gunpowder,
And quickly will return an injury."

20 3. Under what circumstances was the following speech uttered? Show its fitness to the character who uttered it. Explain, or comment on, the words and phrases italicized.

O! be sick, great greatness,
And bid thy *ceremony* give thee cure.
Think'st thou, the fiery fever will go out
With titles blown from adulation?
Will it give place to flexure and low bending?
Canst thou, when thou command'st the beggar's knee,
Command the health of it? No, thou proud dream,
That play'st so subtly with a king's repose:
I am a king, that find thee; and I know,
'Tis not the *balm,* the sceptre, and the ball,
The sword, the mace, the crown imperial,
The *inter-tissued* robe of gold and pearl,
The *farced title* running 'fore the king,
The throne he sits on, nor the tide of pomp
That beats upon the high shore of this world;
No, not all these, thrice gorgeous ceremony,
Not all these, laid in bed majestical,
Can sleep so soundly as the wretched slave,
Who, with a body filled, and vacant mind,
Gets him to rest, cramm'd with *distressful bread.*

Agriculture. (Time, 2 hours.)

[*All questions are of equal value. Answer* six *only.*]

1. Why do we use different kinds of spraying material in our orchards? Discuss fully.

2 Give directions for the preparation of the soil and for the planting of four different kinds of garden crops.

3. What are the most important points to be remembered in the planting of trees and shrubs? Give reasons for your statement.

4. Suggest conditions under which commercial fertilizers (artificial) might be used to greater advantage than stable manure.

5. Describe the different stages in seed production and seed selection of any one of our common farm crops.

6. Compare the advantages and the disadvantages of natural and of artificial incubation of chickens.

7. Discuss briefly feeding, care and management of the dairy herd.

8. Describe the most approved method of hand-milking and subsequent treatment of the milk from the standpoint of its keeping qualities.

FRENCH TRANSLATION. (Time, 2 hours.)

[*Candidates should revise carefully: serious loss of marks is entailed by neglecting to correct obvious errors.*]

Value.

40 1. Translate into good English:—

Que cette rivière est donc flâneuse! Combien (de temps) faudrait-il à cette feuille, qui vient de tomber dans le courant, pour franchir les quelques kilomètres qui séparent Loches de Courçay? Là elle ne pourrait se décider à poursuivre sa route et irait s'échouer dans quelque crique. Nous serions tenté de l'imiter, tant la vallée est pittoresque. Les existences les plus calmes ont, dit-on, un moment de folie et de romanesque. La vallée de Courçay est la minute romanesque de cette paisible rivière. Promptement elle se ressaisit, redevient sage et reprend sa discrète simplicité. C'est à peine si elle se laisse remarquer quand elle arrive à Cormery.

N.B.—*flâneuse:* Flâner means *to loiter, to stroll. ressaisir* means *to regain control. s'échouer* means *to go aground, to stop.*

30 2. Translate into French:—

On the first of June, in bright sunshine, we arrived at Boulogne. At noon we assembled for lunch. In the evening John saw that nothing was lacking and I slept well. Next day we did not go to the opera because the seats were too dear. As we had no time to lose we went to see the Grands Boulevards in the very heart of Paris. There we saw a house on fire and firemen leaning ladders against the walls and climbing the rungs without troubling about the flames that swept all before them. I awoke at half-past eight next morning and set off for Versailles. We visited the favourite residence of the unfortunate queen Marie Antoinette. Later I went to the Jardin des Plantes and admired the great cedar tree. When Jussieu died he did not think that the tree would live: it was to survive however many successive generations and it will live a long time yet while we die around it. A week later we visited the Eiffel Tower. From the top of this tower we saw people walking and they looked like little ants. That evening the dinner was very gay because Jean had passed his examination and carried off a prize.

30 3. (*a.*) Give in French a conversation in a Restaurant—not more than twelve lines.

(*b.*) Write in French questions to which the following are answers:—

(1.) Non, M. Durand n'est pas chez lui.

(2.) Je crois qu'elle est dans la charmille.

(3.) Une épicerie vient après le magasin de modes.

(4.) Oui, elle fond au printemps.

(5.) Je l'ai laissée chez moi.

French Grammar. (Time, 2 hours.)

Value.

10 1. Reply in French in one or two complete sentences to each of the following questions:—

(*a.*) Qu'est ce qu'on mangeait à huit heures, à midi et à quatre heures chez M. Dubois?

(*b.*) Pourquoi Henri ne comprenait-il pas le français des marchandes des Halles?

(*c.*) Pourquoi les Français aiment-ils les Boulevards?

(*d.*) Qu'est-il arrivé à l'incendie?

(*e.*) Qu'y a-t-il à voir à Versailles?

20 2. Describe in French "une soirée au théâtre français."

Or

Write in French to a friend to describe a walk in Paris.

Do not attempt *both* of the above. Use the past definite tense where it is possible to do so.

10 3. Use the adjectives of column B with the nouns of column A, and put *un* or *une* before each:—

A.	B.
famille,	parisien,
foule,	bruyant,
pré,	vert,
phoque,	vilain,
femme,	vieux,
exercice,	vieux,
lionne,	beau,
semaine,	dernier,
rue,	long,
ingratitude.	noir.

10 4. Put into French:—

I asked my father for money.
As we approached Paris the country changed.
You must realize their beauty.
Will he not remember it? (se souvenir).
He has just arrived.

30 5. Give the present indicative, future, and present subjunctive of: *voir, dire, essayer, savoir, pouvoir, faire, vouloir, devenir, aller, punir.*

10 6. Substitute personal pronouns for the words printed in italics:—

On a donné *la lettre à ma soeur.*
Il m'a rendu *l'argent.*
Rendez-moi *mon enfant.*
Apportez *des fleurs à cette femme.*
Attendez *vos amis à la gare.*

10 7. Put into French:—

I am fond of flowers. Give me two or three. This man gave me this flower. That man gave me your book. My book is better than the other. I must see you to-morrow.

GEOMETRY. (Time, 2½ hours.)

[N.B.—*Draw neat diagrams, use printed capitals, and give authorities.*]

Value.

14 1. Prove that the bisectors of the angles of a triangle are concurrent.

14 2. Prove that the area of a triangle is half the area of a rectangle on the same base and having the same altitude.

14 3. Construct a triangle ABC having its vertical angle B equal to a given angle X, the angle at A equal to a given angle Y, and the perpendicular from the vertex to the base 1½ inches in length.

14 4. Prove that the angles made by a tangent to a circle with a chord drawn from the point of contact are respectively equal to the angles in the alternate segments of the circle.

14 5. Two given circles have external contact at A, and a direct common tangent is drawn to touch them at P and Q. Show that PQ subtends a right angle at A.

15 6. Prove that if two chords of a circle cut at a point within it, the rectangles contained by their segments are equal.

15 7. P, Q, R are the middle points of the sides of a triangle, and X is the foot of the perpendicular let fall from one vertex on the opposite side. Show that the four points, P, Q, R, X are concyclic.

CHEMISTRY. (Time, 2 hours.)

[*All questions are of equal value.*]

1. What are the chief characteristic properties of (*a*) acids, (*b*) bases, (*c*) salts? Compose a definition in your own words for each of these three classes of substances.

2. Explain clearly what is meant by the following terms: Allotropes, molar weight, deliquescent, endothermic reaction.

3. Write an account of the physical and chemical properties and uses of (*a*) sulphur dioxide, (*b*) nitric acid.

4. Give one method of preparation for each of the following substances, writing the equation for the chemical reactions involved: Hydrogen peroxide, nitrous oxide, ammonia, sodium carbonate.

5. Write a short account of any one contribution made to the Science of Chemistry by (1) Sir William Ramsay, (2) Dalton.

6. A gas-stove burns 10 cubic feet of gas each hour. Supposing the gas is pure methane, what volume of oxygen is withdrawn each hour from the air? What volume of carbon dioxide is given off?

7 What weight of oxygen can be obtained from 100 grams of potassium chlorate? What volume will this occupy when dry at 745 mm. pressure and at 17° C.?

Atomic weights: K = 39, Cl = 35.5, O = 16.

ALGEBRA. (Time, $2\frac{1}{2}$ hours.)

Value.

10 1. Simplify $\dfrac{6x - 11 - \dfrac{7}{x}}{2 + \dfrac{11}{x} + \dfrac{5}{x^2}} \div \dfrac{\dfrac{5-x}{3x}}{x^2 - 25}$.

10 2. Solve $\dfrac{x-2}{\cdot 05} - \dfrac{x-4}{\cdot 0625} = 56$.

10 3. The denominator of a fraction exceeds the numerator by 4; and if 5 be taken from each, the sum of the reciprocal of the new fraction and 4 times the original fraction is 5. Find the original fraction.

10 4. Solve :—

(*a.*) $22x^2 = 3ax + 7a^2$.

(*b.*) $5x^2 = 17x - 10$.

10 5. Solve $7xy - 8x^2 = 10$; $8y^2 - 9xy = 18$.

10 6. Around a rectangular flower-bed, which is 3 yards by 4 yards, there extends a border of turf which is everywhere of equal breadth and wh e area is 10 times the area of the bed. How wide is it?

10 7. Factor :—

(*a.*) $2ax^2 - 2bx^2 - 6ax + 6bx - 8a + 8b$.

(*b.*) $a^2 + b^2 - c^2 - 9 - 2ab + 6c$.

(*c.*) $ab(x^2 + 1) + x(a^2 + b^2)$.

10 8. Simplify :—

(*a.*) $\left(x^{\frac{n}{n+1}}\right)^{n^2-1} + \dfrac{\sqrt{x^{2n}}}{x}$.

(*b.*) $\dfrac{\sqrt{3} + \sqrt{2}}{2 - \sqrt{3}} \div \dfrac{7 + 4\sqrt{3}}{\sqrt{3} - \sqrt{2}}$.

10 9. Solve $\dfrac{6\sqrt{x} - 7}{\sqrt{x} - 1} - 5 = \dfrac{7\sqrt{x} - 26}{7\sqrt{x} - 21}$.

10 10. (*a.*) What do you know about the graph of the following equations: $y = 5x$, $y = 5x - 4$, and $y = 5x + 6$?

(*b*). Solve graphically $2x + y = 0$; $y = \frac{4}{3}(x + 5)$.

ENGLISH COMPOSITION. (Time, 2 hours.)

[*Candidates are reminded that they are expected to spell and to punctuate correctly. They are therefore urged to leave some few minutes free for a revision of their papers. They are also reminded that they cannot expect marks for paragraphs and essays that are not well organized and well worked out. They are therefore urged to plan their compositions before they begin to write. The plan of the essay in question 3 should be written in the examination book as part of their answer.*]

Value.

16 1. Point out what is faulty in the following sentences, and rewrite them in correct form:—

(*a.*) His sister helped him very much in his work, this was due to her great learning.

(*b.*) Like his father, John's temper frequently got beyond his control.

(*c.*) After he became well enough to talk with her, and finding no reason to restrain herself, she told him that she loved him.

(*d.*) He wore glasses, and even if he was not a well-made man, he was very intelligent.

34 2. Write *one* fully developed paragraph on a topic chosen from each of the groups (*a*) and (*b*):—

(*a.*) Dame van Winkle's view of her husband. The virtues of Varney.

(*b.*) Camelot as seen by Gareth and his men. Life in Arden.

50 3. Write a short essay (do not exceed three pages) on *one* of the following subjects:—

My Idea of Patriotism.
Nelson as a Leader of Men.
The Part Played by Gold in *Silas Marner*.

PHYSICS. (Time, 2 hours.)

[*All questions are of equal value. Answer* six *only.*]

1. (*a.*) Distinguish between density and specific gravity.

(*b.*) A platinum ball weighs 330 grams in air, 315 grams in water, and 303 grams in sulphuric acid. Find the volume of the ball and the specific gravity of the platinum and of the acid.

2. (*a.*) Describe transverse and longitudinal wave motions, naming and defining the parts of each type of wave. Give examples of each type.

(*b.*) A musical note has a frequency of 300 vibrations per second. Calculate the wave-length when the velocity of sound in air is 1,100 feet per second. Find also the wave-length of a note two octaves above this.

3. (*a.*) Describe briefly three modes of transference of heat. Give one example in each case.

(*b.*) 10 grams of ice at —10° C. are put into 100 grams of water at 80° C. Calculate the resulting temperature. (Specific heat of ice .5.)

4. (*a.*) State Charles' Law.

(*b.*) If the volume of a given mass of gas is 120 c.c. at N.T.P., what will be its volume at —13° C. and 640 mm. pressure?

5. (*a.*) State the laws of refraction of light, giving in two ways the meaning of the term "index of refraction."

(*b.*) Construct a diagram to determine the position of the image of an object which is placed farther from a concave mirror than the centre of curvature.

6. (*a.*) What is the evidence that there are two kinds of electrification?
   (*b.*) What experimental facts lead us to suppose that each molecule of iron may be a magnet?

7. (*a.*) Make a diagram of the essential parts and electrical connections of an induction coil and explain how it works.
   (*b.*) What is meant by *polarization of a voltaic cell?* Why should it be avoided? How is it prevented in two different types of cell?

Botany. (Time, 2 hours.)

[*All questions are of equal value. Answer* five *only. Answers should be illustrated with diagrams.*]

1. (*a.*) Describe vegetative reproduction by roots and by leaves, giving examples.
   (*b.*) Describe, with diagrams, the structure of a monocotyledon seed and of a dicotyledon seed. What is the use of each part?

2. Give an account of the structure and life-history of:—
   (*a.*) An alga *or* a fungus.
   (*b.*) A moss *or* a fern.

3. Describe the leaves, cones, and general habit of two conifers of British Columbia.

4. Make drawings to illustrate the structure of a grass flower (or another Gramineæ) and of the flowers of the willow (or another Salicaceæ).

5. Show how the leaves of plants are related to the conditions under which a plant lives and how they vary with change of conditions. Give examples and illustrate structures by the use of diagrams.

6. Write an account of the manufacture of food by plants under the headings: the raw materials, the energy used, how manufactured, the products.

German Grammar. (Time, 2 hours.)

Value.

8 1. Rewrite the following sentence in all persons and genders, making the adjective and pronoun agree with the subject:—
Ich nehme meinen Hund mit mir.

8 2. Insert suitable prepositions and articles or possessive adjectives:—
Er kommt — — Zimmer.
Er stellte den Stuhl — — Tür und — Fenster.
Er ist — — Woche hier.
Ich kann — — Feder nicht schreiben.
Ich stehe — — Pult.
Er wohnt — — Onkel.
Er arbeitet — — Vater.
Es regnete — — Nacht.

12 3. Put into German:—
(1.) The younger brother is as tall as the older one.
(2.) Her book is better than mine.
(3.) The highest buildings are in the largest cities.
(4.) He likes to study, he prefers to read, but he likes best to play.
(5.) The most diligent pupils write best.

Value.

20 4. (*a.*) Change the following infinitive to the correct forms of the present, imperfect, and perfect :—

(1.) Ich bleiben in Hause.

(2.) Du sprechen Deutch.

(3.) Er halten das Buch.

(4.) Er beantworten die Frage.

(5.) Er ankommen Sonntag.

(*b.*) Write (1) and (5) in the future.

(*c.*) Give the imperative (3 forms) of: sich setzen; den Ball werfen.

20 5. Complete the following sentences by inserting appropriate articles or possessive adjectives, giving correct endings to the adjectives and making the verbs agree—the verb of the first sentence to be present tense; second, imperfect; third, perfect; fourth, pluperfect; fifth future. Then rewrite the sentences in the plural throughout:—

(1.) — schön — Laden (stehen) an — recht — Seite — breit — Strasse.

(2.) Dies — stattlich — Gebäude mit — rot — Dach (gehören) mein — gut — Tante.

(3.) — groß — Wagen (fahren) in — Mitte — gepflasters — Fahrweges.

(4.) — jung — Schülerin (schreiben) — lang — Satz an — schwarz — Tafel.

(5.) — klein — Mädchen (sitzen) auf — grün — , hölzern — Bank in —schön — Garten.

32 6. Put into German :—

(1.) I know him well and I know that he must go home.

(2.) He saw that Mr. Braun's new house was burning.

(3.) The letter, which you wrote me last week, has just arrived.

(4.) The lady, to whom I sent the flowers, is a friend of mine.

(5.) He was born on the 27th June, 1759, in the little town of Marbach in Germany.

(6.) There was a large table in the room with many books on it.

(7.) My pencil is longer than hers, but yours is the longest.

(8.) What he liked best in Germany was the arrangement of the trains.

GERMAN TRANSLATION AND COMPOSITION. (Time, 2 hours.)

[*Candidates may choose* either *question 1* or *question 2.*]

1. Translate :—

40 (*a.*) So stieg er denn zur Erde empor, durchstreifte auf seinem Gebiete Wald und Au und lugte nach Menschen aus. Es dauerte nicht lange, so sah er drei muntre Burschen des Weges daherziehen. Handwerksgesellen waren es, die auf der Wanderschaft begriffen waren. Das Ränzel auf dem Rücken, einen derben Stock in der Hand und einen grünen Strauß am Hute, so zogen sie wacker fürbaß und sangen mit hellen Kehlen in die Frühlingsluft hinaus.

(*b.*) Bald brauste denn auch ein gewaltiger Wind vor der Wolke her, und dann prasselten in unendlicher Menge dicke Hagelkörner hernieder. Jedoch auch dies schien dem kühnen Herzog noch kein Hindernis, und mutig setzte er seine Fahrt fort, obwohl die Mähnen der Rosse im Sturme hoch aufflatterten und sie Mühe hatten, vorwärts zu kommen. Er trieb die Tiere immer mehr und mehr an; nur noch eine kurze Strecke, und das Wagnis war gelungen.

Value.

(*c.*) Kaum hatte sie aber eine Strecke zurückgelegt, so fing dieselbe Geschichte wieder an, so daß ihr die Schwere des Korbes fast den Atem benahm. Da sie sich aber nicht lange mehr aufhalten durfte, überwand sie sich, bis sie endlich halbtot vor Müdigkeit in ihrem Hause ankam. Dort schüttete sie den Tragkorb auf dem Söller aus, einen Teil der Blätter aber gab sie ihren beiden Ziegen im Stalle.

(*d.*) Rübezahl zog nun einen Schüssel aus der Tasche, öffnete das Tor und schritt hinein. Geblendet schlug Beit die Augen nieder; denn von den Wänden, vom Boden und der Decke, von allen Seiten blitzte und funkelte das reinste Gold. Im Hintergrunde aber stand eine schwere, eiserne Kiste. Mit einem kunstvoll gearbeiteten goldnen Schlüssel öffnete Rübezahl dieselbe und sprach zu Beit: „Hier ist Geld, soviel du nur haben willst".

2. Translate :—

40 (*a.*) Mutter und Tochter arbeiteten den ganzen Nachmittag im Garten. Als der Abend kam, gingen sie ins Haus zurück. Jetzt holte die Mutter wieder einen Teller voll Suppe. Gertrud kostete die Suppe und sprach: „Das ist eine andere Suppe, die schmeckt besser als die von heute mittag". Und sie aß den ganzen Teller leer. Die Mutter aber lächelte und sprach: „Das ist keine andere Suppe, das ist die Suppe von heute mittag. Sie schmeckt dir ietzt besser, weil du hungrig bist. Heute mittag hattest du keinen Hunger, mein Kind".

(*b.*)
Ich weiß nicht, was soll es bedeuten,
Daß ich so traurig bin;
Ein Märchen aus alten Zeiten,
Das kommt mir nicht aus dem Sinn.
Die Luft ist kühl und es dunkelt,
Und ruhig fließt der Rhein;
Der Gipfel des Berges funkelt
Im Abendsonnenschein.

(*c.*) Der Rattenfänger zog nun ein Pfeifchen aus der Tasche und pfiff. Da kamen die Ratten und Mäuse aus allen Häusern hervorgekrochen und sammelten sich um ihn herum. Nun schritt er die Straße hinab, und der ganze Haufe folgte ihm. So führte er sie bis zum Fluß hinab. Dort trat er in das Wasser, worauf ihm alle Tiere folgten und im Wasser ertranken.

Da die Bürger ihm jetzt nur einen Teil des versprochenen Lohnes geben wollten, ging er zornig weg.

(*d.*) Wie die Vereinigten Staaten von Amerika, so ist auch das Deutsche Reich ein Bundesstaat und wird auf Grund der Reichsverfassung verwaltet. Jeder der 26 Einzelstaaten hat aber zugleich seine eigene Staatsverfassung, und nur Fragen, die das ganze Reich betreffen werden von der Bundesregierung, d. h. von dem Bundesrat und dem Reichstag entschieden.

Der Bundesrat besteht aus 58 Mitgliedern, Vertretern der einzelnen Staaten, die von den Staaten ernannt und nach der Hauptstadt Berlin gesandt werden.

3. Translate (at sight) :—

10 In alten zeiten war die Welt viel schöner als in unseren Tagen. Da war sie voll von Wesen die jetzt nur in der Fabelwelt existieren. Ein wichtiges Völkchen unter diesen Naturgeistern waren die elfen, wovon es Lichtelfen und Schwarzelfen gab. Besonders die Lichtelfen wurden den Menschen oft gefährlich. Sie waren sehr lustig und liebten Gesang, Spiel und nächtliche Tänze im Mondenschein. Sie sahen aus wie Menschen aber sie hatten keine Seele. Eine menschliche Seele zu bekommen war ihr größter wunsch.

Value.

4. Put into German :—

15 Karl : Good morning Wilhelm. I'm glad to see you at school again. How are you to-day ?
Wilhelm : I'm better, thank you, but not yet quite well.
Karl : I'm sorry. I hope you will soon be well.
Wilhelm : Thank you very much. Will you please show me what we have to-day in our German lesson ?

5. Put into German :—

15 Once there was a lazy boy who did not like to go to school. But he had to go, because his father wished it. He could never do his lessons well in class, because he would not study at home, and so he often had to stay in and work when the others played.

20 6. Write in German a composition of about 20 lines on Die Jahreszeiten *or* Deutschland.

GREEK. (Time, 2 hours.)

8 1. Decline in agreement εὐδαίμων στρατιώτης ; οὗτος ὁ ἀνήρ.

6 2. Decline in all genders ἀληθής, ὅδε.

8 3. Decline in full νύξ, ῥήτωρ, θάλαττα, ἐγώ.

14 4. Write the aorist indicative passive of λύω ; the imperfect indicative of εἰμί ; the aorist optative active of ἁρπάζω ; the perfect indicative passive of λείπω ; the present indicative passive of τιμάω ; the imperfect indicative active of ἔχω ; the aorist subjunctive passive of σῴζω.

16 5. Give the principal parts of γράφω, κόπτω, τάττω, φιλέω, ἀκούω, φεύγω, λαμβάνω, δοκέω.

20 Translate into Greek :—

(*a.*) Let us not march into the territory of the enemy.
(*b.*) This man was afraid that you would attempt to injure us.
(*c.*) After this we proceeded ten parasangs through the plain.
(*d.*) This we did that the Greeks might not withdraw.
(*e.*) If he does not do this, he will do wrong.

18 7. Translate into English :—

(*a.*) ἔδεισε μὴ οἱ ἐχθροὶ τιμηθεῖεν.
(*b.*) καὶ ἐκέλευε Κλέαρχον τοῦ δεξιοῦ κέρως ἡγεῖσθαι.
(*c.*) μὴ δίδασκε τὸν παῖδα ἀδικεῖν.
(*d.*) εἰ δόξειε τοῖς πεζοῖς ἐπισιτίζεσθαι, τί ἂν ποιήσαιτε ;
(*e.*) λέγουσι δέ τινες ὅτι Κῦρος ἥσθη.
(*f.*) ἢν δὲ τούς ἄλλους στρατιώτας παρακαλῆτε, πειράσονται πάντες ἀγαθοὶ εἶναι.

10 8. Translate into English :—

ὁ δὲ οἶνος ἐκ τῆς βαλάνου ἐπεποίητο τῆς ἀπὸ τοῦ φοίνικος, καὶ ὁ σῖτος μελίνης ἦν· ταύτης γὰρ ἦν ἡ χώρα πλήρης· ἀμφιλέγουσι δέ τι ἐνταῦθα οἵ τε τοῦ Μένωνος στρατιῶται καὶ οἱ Κλεάρχου· καὶ ὁ Κλέαρχος κρίνει ἀδικεῖν τὸν τοῦ Μένωνος καὶ παίει. ὁ δὲ ταῦτα τοῖς φίλοις ἔλεγεν. οἱ δὲ στρατιῶται ἐπεὶ ἤκουσαν ἐχαλέπαινον καὶ ὠργίζοντο ἰσχυρῶς τῷ Κλεάρχῳ.

Latin Grammar and Composition. (Time, 2 hours.)

Value.

11 1. Write the genitive plural of *fluctus, ignis, dies, vis, iter;* the ablative singular of *mare, uterque, lex;* the dative singular of *res, unus, quidam.*

4 2. Decline together *alius ager, breve tempus.*

3 3. Compare *facilis, magnus, bene.*

8 4. Write the principal parts of *progredior, parco, vinco, cognosco, reperio, consisto, suadeo, conficio.*

10 5. Write the second singular and the third plural of the following tenses:—

(*a.*) Present indicative of *malo, fio.*

(*b.*) Imperfect subjunctive of *morior, venio.*

(*c.*) Future perfect indicative active of *video, reddo.*

(*d.*) Future indicative of *sum, eo.*

(*e.*) Present subjunctive passive of *audio, deleo.*

4 6. Write the perfect infinitive active and present infinitive passive of *fero, vinco.*

60 7. Translate into Latin:—

(*a.*) Do not promise to help the enemies of your fatherland.

(*b.*) I was unwilling to think that you would betray me.

(*c.*) Caesar sent scouts on ahead to find out the character of the island.

(*d.*) We all know why you did not send help to us.

(*e.*) We hope to go to Italy in the summer.

(*f.*) The Aedui were afraid that Caesar would destroy their towns.

(*g.*) Caesar urged the Britons to send as many hostages as possible.

(*h.*) At daybreak we learned that the enemy were beginning to cross the river.

(*i.*) So great a storm arose that the ships were unable to hold their course.

(*j.*) He seems to have been unwilling to become king.

Latin Authors and Sight Translation. (Time, 2½ hours.)

A. Caesar, De Bello Gallico, Books IV. and V.

16 1. Translate:—

His constitutis *rebus*, nactus idoneam ad navigandum tempestatem, tertia fere *vigilia* solvit equitesque in ulteriorem portum progredi et naves conscendere et se sequi *jussit.* A quibus cum id paulo tardius esset administratum, ipse hora diei circiter quarta cum primis navibus Britanniam attigit atque ibi in omnibus collibus expositas hostium copias armatas conspexit. Cujus loci haec erat natura, atque ita montibus anguste mare continebatur, uti ex locis superioribus in litus telum adigi *posset.* Hunc ad egrediendum nequaquam idoneum locum arbitratus, dum reliquae naves eo convenirent, ad horam nonam in ancoris exspectavit.

(*a.*) Account for the case of *rebus, vigilia;* the mood of *posset.*

(*b.*) *equitesque . . . jussit;* rewrite, using *impero* instead of *jubeo.*

13 2. Translate:—

His rebus gestis, Labieno in continente cum tribus legionibus et equitum milibus duobus relicto, ut portus tueretur et rem frumentariam provideret, quaeque in Gallia *gererentur cognosceret,* consiliumque pro tempore et pro re caperet, ipse cum quinque legionibus et pari numero equitum, quem in continenti

Value.

reliquerat, ad solis occasum naves solvit, et leni Africo provectus, media circiter nocte vento intermisso, cursum non tenuit, et longius delatus *aestu*, orta *luce* sub sinistra Britanniam relictam conspexit.

(*a.*) Account for the case of *aestu, luce;* the mood of *gererentur, cognosceret.*

11 3. Translate:—

Interim Trinobantes, legatos ad Caesarem mittunt pollicenturque sese ei dedituros atque imperata facturos; petunt, ut Mandubracium ab injuria Cassivellauni *defendat*, atque in civitatem mittat qui *praesit* imperiumque obtineat. *His* Caesar imperat obsides quadraginta frumentumque *exercitui*, Mandubraciumque ad eos mittit. Illi imperata celeriter fecerunt, obsides ad numerum frumentumque miserunt.

(*a.*) Account for the case of *his, exercitui;* the mood of *defendat, praesit.*

B. VIRGIL, AENEID II., LINES 1–505.

12 4. Translate:—

'o miseri, quae tanta insania, cives?
creditis *avectos* hostes? aut ulla putatis
dona carere *dolis* Danaum? sic notus Ulixes?
aut hoc inclusi ligno occultantur Achivi,
aut haec in nostros fabricata est machina muros,
inspectura domos venturaque desuper urbi,
aut aliquis latet error; *equo ne credite*, Teucri.
quidquid id est, timeo Danaos et dona ferentes.'

(*a.*) Account for the case of *avectos, dolis.*

(*b.*) *inspectura, equo ne credite.* What would be the usual prose constructions?

16 5. Translate:—

ille nihil; nec me quaerentem *vana* moratur;
sed graviter gemitus imo de pectore ducens;
'heu fuge, nate *dea*, teque his' ait 'eripe flammis.
hostis habet muros; ruit alto a culmine Troja.
sat patriae Priamoque datum: si Pergama dextra
defendi possent, etiam *hac* defensa *fuissent.*
sacra suosque tibi commendat Troja Penates;
hos cape fatorum comites, *his* moenia quaere,
magna pererrato statues quae denique ponto.'

(*a.*) Account for the case of *vana, dea, hac, his;* the mood of *fuissent.*

(*b.*) Scan the last two lines.

12 6. Translate:—

Iliaci cineres et flamma extrema meorum,
testor, in occasu vestro nec tela nec ullas
vitavisse vices Danaum, et, si fata *fuissent*
ut caderem, meruisse manu. divellimur inde,
protinus ad sedes Priami clamore vocati.
hic vero ingentem *pugnam*, ceu cetera nusquam
bella forent, nulli tota *morerentur* in urbe,
sic Martem indomitum Danaosque ad tecta ruentes
cernimus, obsessumque acta testudine limen.

(*a.*) Account for the case of *pugnam;* the mood of *fuissent, morerentur.*

C.

20 7. Translate (at sight):—

Flumen est Arar, quod per fines Aeduorum et Sequanorum in Rhodanum influit, incredibili lenitate, ita ut oculis in utram partem fluat judicari non possit. Id Helvetii ratibus ac lintribus junctis transibant. Ubi per exploratores

Caesar certior factus est tres jam partes copiarum Helvetios id flumen traduxisse, quartam fere partem citra flumen Ararim reliquam esse, de tertia vigilia cum legionibus tribus e castris profectus ad eam partem pervenit, quae nondum flumen transierat. Eos impeditos aggressus magnam partem eorum concidit: reliqui sese fugae mandarunt atque in proximas silvas abdiderunt.

Ratis = raft; *linter* = skiff.

University Matriculation, Senior.

ENGLISH LITERATURE. (Time, 3 hours.)

Value.

20 1. (*a.*) Set forth the chief characteristics of the poem *Beowulf*.

(*b.*) Write notes on the following and show in what ways they are related to their age: Wyatt and Surrey, Francis Bacon, Christopher Marlowe, and John Bunyan.

30 2. (*a.*) Quote, or reproduce to the best of your ability, the description of any *two* figures in *The Prologue*. By careful analysis, show the poetic qualities of Chaucer illustrated therein.

(*b.*) Write a brief note on the metre of the lines quoted or reproduced above.

30 3. "The detractors of *The Faerie Queene* demand that it should interest them, while its lovers are satisfied with being charmed and ennobled by it."

Discuss at some length the elements of this poem that contribute to its interest, charm, and ennobling effect.

20 4. (*a.*) To what extent does *Comus* illustrate the Puritan spirit in literature?

(*b.*) What feature of this mask appeals most strongly to you?

PHYSICS. (Time, 3 hours.)

1. A body of mass 100 pounds is acted upon for 10 seconds by an accelerating force equal to the weight of 5 pounds. Find:—

4 (*a.*) The velocity attained.

2 (*b.*) The acceleration.

2 (*c.*) The distance travelled.

4 (*d.*) The power being exerted at the end of the 10 seconds, expressed in foot-pounds per second and in horse-power.

4 2. (*a.*) Find the weight of a cubic yard of rock of specific gravity 2.5. (Make a guess at an answer if you do not remember the necessary data.)

5 (*b.*) Find the mechanical advantage of a jack-screw if the bar or handle is 3½ feet long and the pitch of the screw is ¼ inch.

3 3. (*a.*) How is a stationary wave formed? Give examples of stationary waves.

3 (*b.*) What is the principle of resonance? Give examples in sound, light, and electricity.

3 (*c.*) Show why it is considered necessary to use the equally tempered scale rather than the natural or diatonic scale in such an instrument as the piano.

4 4. (*a.*) Given that the coefficient of linear expansion for 1 degree Centigrade in the case of steel is .000013, find the expansion of a steel bridge span 200 feet long when heated from 30 degrees below zero to 100 degrees above zero on the Fahrenheit scale. (Answer in inches.)

Value.

5 (*b.*) Given that the weight of a cubic metre of air at standard temperature and pressure is 1.293 kg., find the weight of a cubic centimetre of air at 20° C. and 80 cm. pressure.

3 5. (*a.*) Define *critical temperature* and *pressure, dew-point* and *mechanical equivalent of heat.*

3 (*b.*) Neglecting the water equivalent of the calorimeter, find the resulting temperature when 5 grams of steam at 100° C. is passed into 200 grams of water at 20° C.

3 (*c.*) Explain briefly the method of lowering temperature used in a liquid-air machine *or* in an artificial-ice plant.

5 6. (*a.*) An object is placed 30 cm. in front of a spherical mirror and the image is found to be 20 cm. behind the mirror. Find by formula the focal length of the mirror and draw a diagram showing mirror, focus, object, and image.

4 (*b.*) What are the three main classes of visible spectra? Indicate very briefly how each is formed.

5 7. (*a.*) State in a general way the nature, medium of propagation, and possible wave length of sound waves, electric waves, radiant heat waves, light waves, and X-rays.

4 (*b.*) Write a note on colours of natural objects.

5 8. (*a.*) Describe the principle of an electrical condenser, using the terms capacity, dielectric, potential and specific inductive capacity.

4 (*b.*) State some of the properties of lines of magnetic force and indicate in a sentence or two the use made of these lines in describing the production of a current of electricity by induction.

3 9. (*a.*) What is meant by the polarization of an electric battery? How is it prevented in a Daniell cell?

4 (*b.*) What is the current in a 40-watt lamp on a 110-volt circuit and what is the resistance of the filament?

3 (*c.*) What current will be sent through an external resistance of 1 ohm by three Daniell cells, each cell having an E.M.F. of 1.08 volts and internal resistance of 1 ohm, if the cells are arranged in parallel?

15 (A maximum of 15 marks will be allowed for a properly certified laboratory note-book.)

TRIGONOMETRY. (Time, 3 hours.)

10 1. Prove :—

(*a.*) $\sec^2 A = 1 + \tan^2 A$.

(*b.*) $\sin(A + B) = \sin A \cos B + \cos A \sin B$.

10 2. (*a.*) If $25 \sin A = 7$, find $\sin 2A$.

(*b.*) Find the numerical value of $\frac{1}{3}\sin^2 60° - \frac{1}{2}\sec 60° \tan^2 30° + \frac{4}{3}\sin^2 45° \tan^2 60°$.

10 3. Prove :—

(*a.*) $(\tan A - \cot A)\sin A \cos A = 1 - 2\cos^2 A$.

(*b.*) $\tan^2 A \sec^2(90° - A) - \sin^2 A \operatorname{cosec}^2(90° - A) = 1$.

10 4. Solve for all positive angles less than four right angles :—

(*a.*) $\cos^2 A - \sin^2 A = 2 - 5\cos A$.

(*b.*) $\cot^2 A + \operatorname{cosec}^2 A = 3$.

Value.

18 5. In any triangle prove :—

(*a.*) $\sin \frac{A}{2} = \sqrt{\frac{(s-b)(s-c)}{bc}}$.

(*b.*) $\frac{\sin A + \sin B}{\sin C} = \frac{a+b}{c}$.

(*c.*) $a \sin (B - C) + b \sin (C - A) + c \sin (A - B) = 0$.

20 6. If $b = 253$, $c = 189$, $A = 72° \ 14'$, solve the triangle.

Given log 64 = 1.8062	log cot 36° 7′ = 0.1368
log 442 = 2.6454	log tan 11°13′ = $\bar{1}$.2976
log 265.7 = 2.4243	log sin 72°14′ = $\bar{1}$.9788
log 253 = 2.4031	log sin 42°40′ = $\bar{1}$.8311
	log sin 65° 6′ = $\bar{1}$.9576

8 7. Find the area of a triangle whose sides are 171, 204, 195.

14 8. If $a = 243.4$, $b = 147.6$, $c = 185.2$, find A. (Use formula for $\tan \frac{A}{2}$.)

Given log 140.5 = 2.1476
log 102.9 = 2.0123
log 288.1 = 2.4596
log 44.7 = 1.6503
log tan 46°.39′ = .0250

ALGEBRA. (Time, 3 hours.)

12 1. (*a.*) For what value of x will $5 + x$, $7 + x$, and $11 + x$ be in continued proportion?

(*b.*) Solve $\frac{\sqrt{x+7} + \sqrt{x}}{\sqrt{x+7} - \sqrt{x}} = \frac{4 + \sqrt{x}}{4 - \sqrt{x}}$.

12 2. The pressure of wind on a plane surface varies jointly as the area of the surface and the square of the wind's velocity. The pressure on 1 square foot is ·9 pound when the rate of the wind is 15 miles per hour. Find the velocity of the wind when the pressure on 1 square yard is 18 pounds.

14 3. (*a.*) The difference between the third and the sixth term of an A.P. is 12. The sum of the first 10 terms is 45. Find the elements of the series.

(*b.*) How many terms of the series 2, − 6, 18 . . . . must be taken to make − 40?

16 4. (*a.*) What value of K will make the roots of the equation $4Kx^2 - 60x + 25 = 0$ equal?

(*b.*) If m and n are the roots of the equation $2x^2 - 7x + 3 = 0$, construct the equation whose roots are m^2n and mn^2.

14 5. A railway carriage can seat five on each side. In how many ways may a party of four ladies and six gentlemen seat themselves so that the ladies always have the corner seats?

18 6. (*a.*) Find the middle term in the expansion of $\left(x - \frac{1}{x}\right)^{2n}$.

Value.

(*b.*) Find the coefficient of x^{12} in the expansion of $(x^2 + 2x)^{10}$.

(*c.*) Expand to four terms $(1 - 3x)^{-4}$.

14 7. Evaluate, using logarithms, $\sqrt{\dfrac{\sqrt[3]{\cdot 0125} \times \sqrt{31\cdot 15}}{.00081}}$.

The following tables may be used :—

Number.	Mantissa.
125	.09691
3115	.49345
81	.90848
399	.60097
400	.60206

GEOMETRY. (Time, 3 hours.)

12 1. A straight line AB is divided internally at C and externally, in the same ratio, at D, so that AC : CB = AD : BD.

(i.) Prove that CD is divided internally and externally in the same ratio at B and A.

(ii.) If O is the midpoint of AB, prove $OB^2 = OC.OD$.

9 2. If two triangles are equiangular, their corresponding sides are proportional.

9 3. P is any point on a circle whose centre is C and S is a fixed point. If SP is divided internally or externally at P′ in a constant ratio, the locus of P′ is a circle.

9 4. If two similar polygons are similarly placed, the straight lines joining corresponding vertices meet in a point.

9 5. If R is the radius of the circumcircle of the triangle ABC and BD, CD are perpendicular to AB, AC respectively, prove that AC. BD+AB. CD=2 R. BC.

12 6. In both parts of this question omit proofs, but give *all* constructions.

(*a.*) Show how to draw a triangle similar to two given similar triangles and having an area equal to the difference of the areas of the given triangles.

(*b.*) Draw a regular pentagon whose area shall be ⅔ that of a given regular pentagon.

9 7. If two straight lines cut three parallel planes, the lines are divided proportionally.

9 8. It is required to set up a post vertically at a point in a horizontal plane. If the post is 8 feet long and you have three pieces of string each 10 feet long, explain how to use the string to set up the post.

9 9. Show that the sum of any two face angles of a trihedral is greater than the third face angle.

13 10. Three given straight lines, l, m, n, represent the distances from a point within an equilateral triangle to its vertices. Show how to construct the triangle.

French Language. (Time, 3 hours.)

Value.

40 1. Put into French:—

As a statesman, a soldier, a navigator, and a writer of original and varied genius, Raleigh is connected with (a pris part à) all that is interesting in the historical period of Elizabeth. The first possession acquired by England in the New World was discovered by him, and in compliment to that princess, named Virginia. It is a remarkable fact, that, wherever this extraordinary man settled, he left some traces of his usefulness and activity. At Youghal, of which town he was mayor, and where his house and garden are still to be seen, the first potatoes were sowed by Raleigh.

20 2. Translate into French:—

(*a.*) The dog was not thirsty, therefore we could not make him drink.

(*b.*) Do you know that lady? No, but I know her name.

(*c.*) We should like you to come and see us.

(*d.*) We often think of it, don't we?

(*e.*) How long have you been here?

(*f.*) She must have waited for them.

(*g.*) I intend to speak to her, although I am afraid of her.

(*h.*) They are the only actors I wish to see.

(*i.*) You ought not to have done it.

(*j.*) The greatest benefactor of humanity that ever lived is perhaps Pasteur.

10 3. (*a.*) Give the feminine of: secret, faux, mou, pêcheur, compagnon.

(*b.*) Give rules for position of adjectives with regard to nouns they qualify; examples.

(*c.*) Give examples showing by translation the differences of meaning when the following adjectives precede or follow the noun: bon, grand, brave.

6 4. Express the same idea with a different construction, making the necessary changes in each sentence:—

(*a.*) J'ai blessé mon pied hier soir.

(*b.*) Il nous faut savoir ceci avant demain.

(*c.*) La leçon durait depuis une demi-heure.

4 5. Put the italicized verbs in the correct tenses:—

(*a.*) Respectez mes décisions, quelles qu'elles *être*.

(*b.*) Si nous *faire* ainsi nous serions punis.

(*c.*) Il est possible qu'ils *venir* ici, mais rien n'est sûr.

(*d.*) Nous pensons voyager aussitôt que nous *pouvoir*.

10 6. Give the third person singular present indicative of: s'asseoir, croître, lire, résoudre.
Third person singular preterite of: suivre, naître, vêtir, pouvoir.
First person singular future of: acquérir, cueillir, mourir, envoyer.
First person singular present subjunctive of: avoir, vouloir, prendre, courir.
Past participle of: dire, savoir, rire, valoir.

10 7. Substitute the correct French words for those printed in italics:—

J'ai lu le livre sur *which* vous avez appelé mon attention.
Je connais le monsieur *to whom* vous voulez me présenter.
What est écrit est *what* j'ai dit.
L'homme *whom* je connais est *the one who* parle si bien.
Nous passerons six mois *in* France et j'espère rester longtemps *in* Paris avant de m'installer pour de bon *in* Canada.

HISTORY. (Time, 3 hours.)

[Five *questions to be answered.*]

Value.

20 1. Describe the general conditions of 18th Century Europe before the French Revolution.

20 2. Account for the rise and fall of Napoleon.

20 3. Outline the economic and political results of the Industrial Revolution in Great Britain.

20 4. Sketch carefully the part played by Bismarck in creating the German Empire.

20 5. Describe the policy of Britain in *either* India *or* Africa during the 19th Century.

8 6. (*a.*) Describe the conditions which led to the passing of the Great Reform Bill of 1832.

12 (*b.*) Compare it with the Reform Bills of 1867, 1884, 1918.

20 7. "A republic divides us the least." Discuss this phrase with reference to the formation and growth of the Third French Republic.

20 8. Discuss the origins of the World War with special reference to the Expansion of Europe.

ENGLISH COMPOSITION. (Time, 3 hours.)

10 1. Improve each of the following sentences, and state clearly your reasons for making the changes:—

(*a.*) A great crime against human liberty will be consummated, for these people are being lured from their homes by wilful deceit, and their own childishness and ignorance is hastening them to their doom.

(*b.*) "There is no difference," said the elm, "between the sap in our trunks and the other trees in the forest."

(*c.*) The early Roman occupation of Britain lasted from about 40 B.C. to 410 A.D., but they left behind them in all that time only six words.

(*d.*) Passing along the avenues of the old town, our thoughts drifted from music to poetry.

(*e.*) With the assistance of this man his trunk was soon found, inspected, checked, and put on top of a cab which waited outside, and as Paul was driven through the crowded streets, there burst upon his astonished sight for the first time a full view of American city life.

15 2. Another aspect presents itself. One is tempted to say that the most human plants, after all, are the weeds. How they cling to man and follow him around the world, and spring up wherever he sets his foot! How they crowd around his barns and dwellings, and throng his garden and jostle and override each other in their strife to be near him! Some of them are so domestic and familiar, and so harmless withal, that one comes to regard them with positive affection. Motherwort, catnip, plantain, tansy, wild mustard—what a homely human look they have! They are an integral part of every old homestead. Your smart new place will wait long before they draw near it. Our knot-grass, that carpets every old door-yard, and fringes every walk, and softens every path that knows the feet of children, or that leads to the spring, or to the garden, or to the barn, how kindly one comes to look upon it! Examine it with a pocket glass and see how wonderfully beautiful and exquisite are its tiny blossoms. It loves the human foot, and when the path or the place is long disused other plants usurp the ground.

(*a.*) Discuss carefully the unity, coherence, and emphasis of the above paragraph. Write notes on the method of paragraph development employed and the choice of diction.

Value.

15 3. Rewrite the following paragraph so as to improve its coherence and emphasis:—

Charlotte Cushman loved fame, worshipped money, and was devoted to her art. That she was a great artist has never been questioned. In private life she was a charming woman. The moment she entered the theatre, either at rehearsal or at a performance, her whole soul was wrapped up in her art. If she was somewhat miserly with money in general, she was extravagant in her assistance and encouragement to those in whom she saw genius and talent. Of Charlotte Cushman's greatness in some parts there is no question. Meg Merrilies, Lady Macbeth, and Queen Catherine were her best parts. At rehearsals she was ever kind and tender, never tiring in teaching those who were lacking in experience or were suffering from stage fright.

60 4. Write an essay about two pages in length on *one* of the following subjects:—

(*a.*) Characteristics of Dress in the Days of Chaucer.

(*b.*) Edmund Spenser, "the poets' poet."

(*c.*) The value of a High School Course.

CHEMISTRY. (Time, 3 hours.)

[*All questions are of equal Value. Answer* ten *only.*]

[*Atomic weights are given at the end of the paper.*]

1. What is meant by valency? Can we deduce the valency of an element from a knowledge of the number of atoms in its molecule? The chloride of an imaginary element contains 38.11% chlorine and 61.89% of the element. The vapor density of the compound referred to air is 12.85. What is the atomic weight of the element, so far as this investigation of this one compound can give it? What is its valency?

2. State the following laws in your own words: Dalton's, LeChatelier's, Dulong and Petit's, multiple proportions.

3. Explain clearly what is meant by the following terms: Hydrolysis, atomic weight, osmotic pressure, chemical equilibrium, complex ion.

4. Write an account of the chemistry of antimony and its compounds.

5. What is meant by a normal solution? What weight of the following chemicals would you take to make a litre of a normal solution: Sulphuric acid, silver nitrate, arsenious acid, iodine, and potassium dichromate for oxidizing in an acid solution?

6. Given a solution of a single salt, how would you test for the following: Copper, silver, aluminium, calcium, zinc, nitric acid, phosphoric acid?

7. How does aluminium occur in nature? How is the metal extracted? What are its chief physical and chemical properties? Write a short note on the chemistry of its most important compounds.

8. How are the following chemicals prepared: Primary calcium ortho-phosphate, sodium bicarbonate, lead acetate, stannous chloride, copper sulphate?

9. Determine the purity of a sample of anhydrous sodium carbonate 6 grams of which gave, when acted upon by an excess of acid, 1310 c.c. of CO_2 at 10 degrees Centigrade and 750 mm. pressure.

10. 8.2 grams of crystallized barium chloride ($BaCl_2$, $2H_2O$) and 7 grams of sulphuric acid (70% H_2SO_4) were brought together in aqueous solution. What weight of barium sulphate was precipitated?

11. A specimen of a mineral gave by analysis the following percentage composition: 34.40% Cu, 30.47% Fe, and 35.1% S. What is its probable formula?

Atomic weights: Cl = 35.5, S = 32, Ag = 108, N = 14, As = 75, I = 127, Na = 23, C = 12, K = 39, Cr = 52, Ba = 137, Cu = 63, Fe = 56.

NOTE.—A maximum of 15 marks will be allowed for laboratory note-books.

Value.

FRENCH LITERATURE. (Time, 3 hours.)

10 1. Was Corneille "un génie tout instinctif"?

10 2. What are the essential differences between Racine and Corneille?

10 3. Write a short appreciation of any Romantic poet and name some of his works.

10 4. Compare Voltaire and J. J. Rousseau.

5. Translate the following passages and comment on the words or expressions in italics:—

15 (*a.*) Père, maîtresse, honneur, amour,
Noble et dure contrainte, aimable tyrannie,
Tous mes plaisirs sont morts, ou ma gloire ternie.
L'un me rend malheureux, l'autre indigne du jour.
Cher et cruel espoir d'une âme généreuse,
Mais *ensemble* amoureuse,
Digne ennemi de mon plus grand bonheur,
Fer qui causes ma peine,
M'es-tu donné pour venger mon honneur?
M'es-tu donné pour perdre ma Chimène?

15 (*b.*) *Andromaque*—Ah! de quel souvenir viens-tu frapper mon âme!
Quoi? Céphise, j'irai voir expirer encor
Ce fils, ma seule joie, et l'image d'Hector:
Ce fils, que de sa flamme il me laissa pour gage!
Hélas! je m'en souviens, le jour que son courage
Lui fit chercher Achille, ou plutôt le trépas,
Il demanda son fils, et le prit dans ses bras:
"Chère épouse, dit-il en essuyant mes larmes,
J'ignore quel *succès* le sort garde à mes armes;
Je te laisse mon fils pour gage de ma foi:
S'il me perd, *je prétends* qu'il me retrouve en toi.
Si d'un heureux hymen la mémoire t'est chère,
Montre au fils à quel point tu chérissois le père."

10 (*c.*) Sa gloire littéraire repose sur ses *Fables*. Il a créé le genre. Nul ne soupçonnait le parti qu'on en pouvait tirer. Quoiqu'il n'ait pas inventé ses sujets, il a déployé dans ses fables toute l'originalité de son espirit. Il a puisé sa matière chex Esope, chez Phèdre, chez d'autres encore, mais il en a fait de petits tableaux dramatiques incomparables.

Mon imitation n'est point un esclavage.
Je ne prends que l'idée, et les tours et les lois
Que nos maîtres suivaient eux-mêmes autrefois.

Dans la fable I du livre V, il indique avec modestie ce qu'il a voulu faire: instruire, plaire, attaquer les vices ou les travers par le ridicule, agrandir la fable antique et la transformer en

Une ample comédie, à cent actes divers,
Et dont la scène est l'univers.

Value.

20 (*d.*) *Electeurs de drap d'or, cardinaux d'écarlate,*
Double sénat sacré dont la terre s'émeut,
Ne sont là qu'en parade, et Dieu veut ce qu'il veut.
Qu'une idée, au besoin des temps, un jour éclose,
Elle grandit, va, court, se mêle à toute chose,
Se fait homme, saisit les coeurs, creuse *un sillon;*
Maint roi la foule aux pieds ou lui met un bâillon;
Mais qu'elle entre un matin *à la diète, au conclave,*
Et tous les rois soudain verront l'idée esclave
Sur leurs têtes de roi que ses pieds courberont,
Surgir, le globe en main ou la tiare au front.
Le pape et *l'empereur* sont tout. Rien n'est sur terre
Que pour eux et par eux.

LATIN COMPOSITION, SIGHT TRANSLATION, AND HISTORY. (Time, 3 hours.)

A.

Value.

40 1. Translate into Latin:—

(*a.*) On receiving the news Caesar sent forward scouts and centurions to choose a suitable place for a camp.

(*b.*) Would that Caesar had not been killed.

(*c.*) Nothing is so characteristic of a narrow mind as to love riches.

(*d.*) It is not allowable to remain more than a year in one place.

(*e.*) The Gauls immediately sent ambassadors to Caesar to say that they had not entered into a league against Rome, and that they had not united with the Germans.

(*f.*) The Gauls promised to send hostages to Caesar on the condition that their wives and children were spared.

(*g.*) We all know that the enemy are afraid that Pompey will be sent out to Asia as commander in chief.

(*h.*) Cicero urged the Roman people not to think that he had said this to win Pompey's favour.

B.

30 2. Translate into English:—

FLIGHT OF MEDEA AND DEATH OF JASON.

Vix vestem induerat Glauce, cum dolorem gravem per omnia membra sensit, et post paulum diro cruciatu affecta e vita excessit. His rebus gestis, Medea, furore atque amentia impulsa, filios suos necavit: tum magnum sibi fore periculum arbitrata, si in Thessalia maneret, ex ea regione fugere constituit. Hoc constituto, Solem oravit, ut in tanto periculo auxilium sibi praeberet. Sol autem, his precibus commotus, currum quendam misit, cui dracones, alis instructi, iuncti erant. Medea non omittendam tantam occasionem arbitrata, currum conscendit, itaque per aera vecta, incolumis ad urbem Athenas pervenit. Iason autem post breve tempus miro modo occisus est. Ille enim (sive casu sive consilio deorum) sub umbra navis suae, quae in litus subducta erat, olim dormiebat. At navis, quae adhuc erecta steterat, in eam partem, ubi Iason iacebat, subito delapsa virum infelicem oppressit.

C.

Value.

30 3. (*a.*) State the provisions and effect of the Hortensian Law.

(*b.*) Write the causes which led to the First Punic War.

(*c.*) Give a short account of the career of Regulus.

(*d.*) Give an outline of the progress of the Roman conquest in the lands to the east of the Adriatic.

LATIN AUTHORS. (Time, 3 hours.)

15 1. Translate:—

Utinam, Quirites, virorum fortium atque innocentium copiam tantam haberetis, ut haec vobis deliberatio difficilis esset, quemnam potissimum tantis rebus ac tanto bello praeficiendum putaretis! nunc vero cum sit unus Cn. Pompeius, qui non modo eorum hominum, qui nunc sunt, gloriam, sed etiam antiquitatis memoriam virtute superarit, quae res est quae cuiusquam animum in hac causa dubium facere possit?

(*a.*) What is the force of the imperfect subjunctive with *utinam?*

(*b.*) *quemnam praeficiendum putaretis.* What would be the usual construction?

15 2. Translate:—

Etenim talis est vir, ut nulla res tanta sit ac tam difficilis, quam ille non et consilio regere et integritate tueri et virtute conficere possit. Sed in hoc ipso ab eo vehementissime dissentio, quod, quo minus certa est hominum ac minus diuturna vita, hoc magis res publica, dum per deos immortales licet, frui debet summi viri vita atque virtute. At enim 'ne quid novi fiat contra exempla atque instituta maiorum.' Non dicam hoc loco, maiores nostros semper in pace consuetudini, in bello utilitati paruisse, semper ad novos casus temporum novorum consiliorum rationes accommodasse.

(*a.*) *possit*—account for mood.

(*b.*) *hoc magis, etc.*—account for case of *hoc.*

(*c.*) *novi*—parse

(*d.*) Mention the characteristics and achievements of Pompey brought forward by Cicero as arguments for his fitness for sole command in the Mithridatic War.

20 3. Translate:—

Sunt quibus ad portas cecidit custodia sorti,
inque vicem speculantur aquas et nubila caeli,
aut onera accipiunt venientum, aut agmine facto
ignavum fucos pecus a praesepibus arcent.
Fervet opus, redolentque thymo fragrantia mella.
Ac veluti lentis Cyclopes fulmina massis
cum properant, alii taurinis follibus auras
accipiunt redduntque, alii stridentia tingunt
aera lacu; gemit impositis incudibus Aetna;
illi inter sese magna vi brachia tollunt
in numerum, versantque tenaci forcipe ferrum:
non aliter, si parva licet componere magnis,
Cecropias innatus apes amor urget habendi
munere quamque suo. Grandaevis oppida curae
et munire favos et daedala fingere tecta.
At fessae multa referunt se nocte minores,
crura thymo plenae; pascuntur et arbuta passim
et glaucas salices casiamque crocumque rubentem

Value.

et pinguem tiliam et ferrugineos hyacinthos.
Omnibus una quies operum, labor omnibus unus:
mane ruunt portis; nusquam mora; rursus easdem
vesper ubi e pastu tandem decedere campis
admonuit, tum tecta petunt, tum corpora curant;
fit sonitus mussantque oras et limina circum.

(*a.*) Principal parts of *cecidit.*

(*b.*) Parse *sorti.*

(*c.*) Write notes on *Cyclopes, Cecropias.*

25 4. Translate:—

Extemplo Libyae magnas it Fama per urbes,
Fama, malum qua non aliud velocius ullum:
mobilitate viget, viresque acquirit eundo,
parva metu primo, mox sese attollit in auras
ingrediturque solo et caput inter nubila condit.
Illam Terra parens, ira irritata deorum,
extremam, ut perhibent, Coeo Enceladoque sororem
progenuit pedibus celerem et pernicibus alis,
monstrum horrendum ingens, cui, quot sunt corpore plumae,
tot vigiles oculi subter (mirabile dictu),
tot linguae, totidem ora sonant, tot surrigit aures.
Nocte volat caeli medio terraeque per umbram
stridens, nec dulci declinat lumina somno;
luce sedet custos aut summi culmine tecti
turribus aut altis, et magnas territat urbes,
tam ficti pravique tenax quam nuntia veri.
Haec tum multiplici populos sermone replebat
gaudens et pariter facta atque infecta canebat.

(*a.*) Scan the four lines beginning *Illam terra* and ending *corpore plumae.*

(*b.*) *qua*—account for case.

(*c.*) Give principal parts of *progenuit, surrigit, sedet, replebat, canebat.*

25 5. Translate:—

Nusquam tuta fides. Eiectum litore, egentem
excepi et regni demens in parte locavi;
amissam classem, socios a morte reduxi:
heu furiis incensa feror! nunc augur Apollo,
nunc Lyciae sortes, nunc et Iove missus ab ipso
interpres divum fert horrida iussa per auras.
Scilicet is superis labor est, ea cura quietos
sollicitat. Neque te teneo neque dicta refello:
i, sequere Italiam ventis, pete regna per undas.
Spero equidem mediis, si quid pia numina possunt,
supplicia hausurum scopulis et nomine Dido
saepe vocaturum. Sequar atris ignibus absens,
et, cum frigida mors anima seduxerit artus,
omnibus umbra locis adero. Dabis, improbe poenas.
Audiam, et haec manes veniet mihi fama sub imos.'

(*a.*) *Eiectum litore . . . a morte reduxi.* Explain the ingratitude of Aeneas referred to by Dido in those words.

(*b.*) How was the prophecy of Dido, contained in the last four lines of this extract, fulfilled?

(*c.*) Explain references to *Augur Apollo, Lyciae sortes, interpres divum.*

(*d.*) Parse and give principal parts of *sequere, hausurum, seduxerit, adero.*

Third-year Course, Commercial.

ECONOMICS AND CIVICS. (Time, 2 hours.)

[NOTE.—*Answers should be brief and to the point, but "Yes" or "No" will not be accepted unless a reason is stated.*]

Value.

10 1. What do you understand by "economic good," "production," "distribution," and "consumption"?

15 2. Write notes on each of the following and give illustrations:—

(*a.*) Marginal utility.

(*b.*) Diminishing returns.

(*c.*) Law of Supply and Demand.

10 3. What are the chief uses of money? What money is turned out by the Canadian mint? Distinguish between "wealth" and "money."

If all Germany's paper money should become worthless, would the wealth of the nation at large be impaired? Explain.

10 4. What political party is in power in British Columbia? Who are the members of the B.C. executive and what are their departments?

10 5. How are custom and excise duties collected? Illustrate by reference to specific commodities.

15 6. Write notes on:—

(*a.*) The speech from the throne.

(*b.*) The budget speech.

(*c.*) Speaker of House of Commons.

(*d.*) Parliamentary procedure.

(*e.*) Preferential tariff.

10 7. By what routes would you ship the following: Apples, Vancouver Island to Winnipeg; fish, Prince Rupert to Edmonton; lumber, Genoa Bay, Vancouver Island, to Liverpool, Eng.; canned salmon, Vancouver to Montreal?

What is meant by "classification of freight"?

Explain "mountain rates" and state arguments for and against from view-points of B.C. and C.P.R.

10 8. What are the chief commodities that Canada ships abroad? Who are the consumers of these commodities?

Show how production and trade in Canada is subject to Government interference.

10 9. Select two of British Columbia's most important industries and state the natural facilities that B.C. possesses for these industries. Outline what you think the future development may be.

ARITHMETIC. (Time, 30 minutes.)

A. Rapid Calculation.

[NOTE.—*The time allowance for Arithmetic, Third-year Course, Commercial, is 2½ hours; after the expiration of 30 minutes, answers to Section A (Rapid Calculation) will be collected, and Section B (General) will then be distributed to candidates. Candidates will complete their work on this sheet and hand it in; no other work is necessary, but candidates may use their examination booklets for solving problems.*]

Value.

30 1. Departmental Store Sales for the Week Ending April 28, 1923:—

Day.	Clothing.	Dry Goods.	Furniture.	Hardware.	Groceries.	Total.
Monday	$547 25	$ 836 40	$624 30	$934 75	$1,216 80	
Tuesday	612 50	875 20	610 25	876 90	1,140 40	
Wednesday ...	710 20	604 30	930 20	750 40	1,190 10	
Thursday	675 00	787 50	730 80	910 00	1,250 60	
Friday	730 10	820 60	790 80	873 60	1,360 10	
Saturday	940 60	1,020 40	810 60	950 20	1,560 50	

Add vertically and horizontally and prove your work.

8 2. Find the sum of the products:—

64 x 66 =
348 x 25 =
124 x 102 =
75 x 36 =

12 3. What is the value of the following bill of lumber at $42 per thousand?—

75 pcs. 2″ x 4″—14′
48 pcs. 3″ x 8″—16′
150 pcs. 1″ x 8″—12′
60 pcs. 2″ x 12″—16′

8 4. If a city tax rate is 41 mills on the dollar, what does a man pay on an assessment of $3,470?

10 5. Find the net cost of an invoice of $750 less discounts of 37½%, 15%, and 2½%.

11 6. A collector obtained 60% of a debt and after deducting 10% commission, remitted $421.20 to his principal. What was the whole amount of the debt.

10 7. Simplify $(\frac{7}{8}$ of $\frac{16}{21} + \frac{1}{3}$ of $2\frac{1}{2} \div \frac{3}{4}$ of $\frac{5}{9}) \times 2.1\dot{6}$.

11 8. A merchant had during the year $12,000 worth of merchandise. His sales were $9,500 and he had $4,250 worth of goods on hand at the end of the year. What was his rate of gain?

ARITHMETIC. (Time, 2 hours.)

B. General.

[NOTE.—*The time allowance for Arithmetic, Third-year Course, Commercial, is 2½ hours; after the expiration of 30 minutes, answers to Section A (Rapid Calculation) will be collected, and Section B (General) will then be distributed.*]

Value.

1. A cylindrical tank is 12 feet deep and 6 feet in diameter.

7 (*a.*) How many square feet are there in its entire surface?

7 (*b.*) If a cubic foot contains 25 quarts, find how many gallons of water the tank will hold.

14 2. It costs a manufacturer $1,500 to build an automobile. What must be the list price so that he can sell it to a retailer at a discount of 25% and yet make a profit of 25% after allowing his salesman a commission of 16⅔% for selling it to the retailer?

14 3. A man invests $2,500 for the benefit of his son, who is now just 14 years of age. What amount will there be to his credit when he is 21 years of age, interest compounded semi-annually at 5% per annum? ($1.025^{14} = 1.41297$.)

14 4. The records of a certain railway for its fiscal year ending September 30, 1921, show the following: Gross earnings from passengers, $7,864,241; from freight, $22,314,598; from all other sources, $5,472,694; expenses, $20,479,475; taxes, rentals, etc., $6,125,689. What was the surplus for the year after the declaration of a dividend of 8% on a capital stock of $91,347,500? What per cent. of the total earnings were the expenses?

14 5. A merchant imported a lot of steel knives from England as follows: 75 dozen at 12s. 6d. per dozen; 20 dozen at £1 8s. 6d. per dozen; 12 dozen at £2 9s. 6d. per dozen; 10 dozen at £2 10s. 6d. per dozen; 30 dozen at £1 5s. 6d. per dozen. The charges in England amounted to £7 12s. 6d. The Consul's fee was 12s. 6d. Marine insurance was 20 cents per hundred on the invoice. The cartage amounted to $2.50. The duty was 30% ad valorem and 30 cents per dozen. Find the cost of the invoice if £1=$4.20.

14 6. On June 5, J. R. Simpson deposited with his broker $1,200 as a 10 per cent. margin for the purchase of 120 shares of Bell Telephone stock at 135. The stock was sold on June 25 at 137½. What were the profits of the transaction if money is worth 6%, and there was brokerage each way of ⅛%?

16 7. At a storage warehouse flour was received and delivered as follows:—

Received.		Delivered.	
April	5, 200 bbls.	April	15, 150 bbls.
„	30, 300 „	May	2, 160 „
May	10, 280 „	„	15, 300 „
„	25, 350 „	„	28, 400 „
June	1, 200 „	June	4, 180 „
		„	10, 140 „

How much must be paid for storage if 5 cents per barrel be charged for the first 10 days or part of 10 days, and 3 cents per barrel for each subsequent 10 days or part of 10 days?

Business Correspondence. (Time, 2 hours.)

[Note to Presiding Examiner.—*Please provide the candidates with plain white letter paper and envelopes.*]

[*The use of pen and ink or typewriter is optional.*]

A. W. Rombler, 146 16th Ave. West, Vancouver, B.C., writes a letter (15/4/23) (No. 1) to Sharps and Shaver, Barristers and Solicitors, 402 Rogers Bldg., Vancouver, stating that, while his Ford Car, Licence No. 22246, was halted by the Traffic Policeman on Granville St. bridge on Friday, April 13, 1923, at 5.15 p.m., it was struck by Street Car No. 41, Motorman No. 411, and the rear fender and wheel were severed from the chassis, and rear axle housings cracked. He asks the firm to file a claim for stated damages against the B.C. Electric Company, Limited. The firm does so and notifies the B.C. Electric Company by letter (17/4/23) (No. 2) to that effect. The B.C. Electric Company replies by letter (20/4/23) (No. 3) stating that as the motor-car in question was standing on its "right-of-way" when damaged, they are not liable for the loss sustained, and are determined to contest the claim.

Value.

20 1. Write letter No. 1. Address the envelope.

20 2. Write letter No. 2. Address the envelope.

20 3. Write letter No. 3. Address the envelope.

8 4. (*a.*) Explain clearly what is meant by Indexing and Précis writing in correspondence.

8 (*b.*) Show an Index and Précis Card properly written up to cover the three letters above.

8 5. (*a.*) Describe fully and give the advantages and disadvantages of the "Numerical System" of Filing. To what kinds of business is it especially adapted?

8 (*b.*) Explain fully the method of operating the "Direct Name System" of Filing. Illustrate by drawings the arrangement of Guides and Folders. Show how you would file the three letters above.

8 (*c.*) Tell briefly how you would handle the "Miscellaneous Correspondence" by either system.

Typewriting.

[Note to Presiding Examiner.—*Please provide each candidate with plain white letter paper and one sheet of carbon paper.*]

[Note.—*Candidates are allowed 5 minutes to read over this paper. Time allowed for Section A, 15 minutes. Section B is to be written in full, and the time taken by each candidate to be recorded by the Presiding Examiner. Write Section A double spacing, without carbon copy. Write each part of Section B, in proper form, on a separate sheet of paper, and hand in carbon copies with originals.*]

Value.

50 *Section A.*

Sitting at breakfast in the morning, a man seldom reflects that for his personal satisfaction the good and useful fruits of the earth and products of labour have been gathered from every quarter of the globe. Beside his plate, which has been made in Staffordshire, is a spoon from the Oneida Community works in New York State and a knife and fork from Sheffield, with handles of wood from Africa or horn from South America. He sits on a chair made of wood from Northern Canada, varnished with the resin of a tree in Burmah or Japan, dissolved in

turpentine from the sea-pines of the Landes Department of France or the swamp-pines of the Alabama. The seat is of cane from the Malay peninsula. His table-cloth and napkin are from Belfast. He has tea from China or Japan, coffee from Java or Brazil, bread from wheat grown in the Canadian North-west, leavened with yeast from Germany. He has canned salmon from British Columbia or canned rabbit from Australia, sealed in tin from Wales. His breakfast is cooked with coal from Pennsylvania, on a stove made of Indiana iron, and surmounted with pipes of sheet iron from the penal colony of Siberia. His salt is from Goderich, his pepper from Ceylon or South America, and his sauce from Worcestershire. He has butter from a neighbouring farm, perhaps coloured with annatto from Cayenne. His buns are made more palatable by a few currants from Greece.

The commerce which enables a man to obtain for his own use the products of all parts of the world must be complicated and wonderful. He may be a carpenter or bricklayer, a physician, a lawyer, or a teacher; he may work in a great factory feeding material to a machine which does but one of many operations necessary to the making of some article in common use. Yet for this single useful service, useful only as a help to many others, he is able to secure the many and varied products of the world's industries.

When it is remembered that the production of any one of the things gathered at the breakfast table requires the aid of many hands, trained in various lines of industry, and working in different climes and continents, the truly complex nature of the world's commerce becomes apparent. Through this intricate commerce we live by satisfying each other's wants. By following one line of industry and becoming specially proficient, each is able to secure a share of the products of all the others. To accomplish that end in a community in which each is careful of his own property and jealous lest others may obtain that which is his, is the aim of our trade and industry.

Every useful service rendered for reward, whether the building of a wall, the cooking of a meal, the making of a shoe, the teaching of a lesson in school, the navigation of a ship, or the digging of ore in the mine, is a part of this complicated mechanism, having a relation to all the other parts. Here is something marvellous with which we are surrounded, which we must touch at every turn, which has an influence in settling all the practical questions of daily life, and which we should study and seek to comprehend. The easiest road to an understanding of our complicated industrial and commercial mechanism may be found in the analysis of a single transaction, and for that purpose let us select the purchase of a pair of boots in a city store.

INJECTING PERSONALITY INTO AN ORGANIZATION.

Industrial organization has outgrown the one-man stage. Business is too big, interests are too varied, one man cannot do or give enough to contain a whole business in himself. The corporation—which signifies the resources, the brains, the work of many men merged for one pur-

Value.

pose—is now the business unit. When many men combine, their individual personalities disappear. The result is an impersonal body.

But just as personality is the vital spark in the man, so it is the active force in a business—impersonality implies weakness. Therefore the problem of the business man of to-day is to give a personality to the great impersonal corporation of which he is chief.

Personality implies something human. The only source from which a business can draw a personality is the human element in it, the men who are carrying on its activities. The men in an industrial organization must make the business a part of themselves and themselves an organic part of the business; they must put into their work their own personalities.

Then the business will acquire a personality. This, then, is the problem of the corporation chief: to make men feel that they are not simply cogs of a great machine, their acts geared to the ponderous activity of the whole; to make men realize that they have responsibilities, not only as business getters and money makers but toward the public good and toward their business associates—that their every act is adjudged; to bring men to respect their profession not alone as a means for acquiring wealth but as a life work and the work itself as its own reward.

If men with these commercial ideals could be put behind the guns of a business, that business would become a human active force, a personality.

50 *Section B.*

Vancouver, B.C., June 10, 1923. The Hilton Hardware Co., 239 Main St., City. Dear Sirs: In answer to your inquiry No. 856, we take pleasure in quoting you the following prices:—

3″	Stove Pipe,	$4.55	per 100	points.	
4″	„	„	5.00	„	„	„
5″	„	„	6.23	„	„	„
6″	„	„	7.52	„	„	
5½″	„	„	6.78	„	„	„
7″	„	„	8.33	„	„	„

Thanking you for your letter, and assuring you that we can ship the goods promptly upon receipt of order, we are Yours very truly,

Annual Earnings and Dividends.

Year.	Net Revenue.	Dividends Paid.	Added to Reserves.	Added to Surplus.
1919.....	$ 5,486,058	$4,078,601	$ 937,258	$ 470,198
1920.....	7,398,286	5,050,024	1,377,651	970,611
1921.....	7,835,272	6,584,404	522,247	728,622
1922.....	10,564,665	8,619,151	728,140	1,217,374

Vancouver, B.C., June, 1923. Miss Olga Abelson, Nelson, B.C., Dear Madam: When a woman is suddenly called upon to face the perplexities of financial matters with which she is, perhaps, unfamiliar, a conservative banker is her safest counsellor.

There are many unscrupulous promoters, who, with enticing words or attractive advertisements, are offering bonds, stock, mortgages, and investment ventures which are of questionable value and which should not be considered without advice.

Your first consideration should be to place your money where the safety of the principal is assured. You should also be able to exercise control over the principal; that is, to convert it, or at least a part of it, into cash with readiness, should occasion arise. Therefore, great care should be exercised in choosing investments.

If you should want any information or advice regarding financial matters, we would gladly give you the benefit of our knowledge and experience whenever you care to consult us. Yours very truly.

Vancouver, B.C., June, 1923. Messrs. Langdon and Greenman, 407 Pandora Avenue, Victoria, B.C. Gentlemen: We have received your remittance of $367.74 to apply on your July account. We have credited your account for the above amount, together with discount due of $39.39, making a total of $407.13. This leaves a balance of $214.31, according to the figures shown on our July statement.

However, credit for the discrepancies brought to our attention some time ago has been passed for $253.70. This credit, which will be shown on your August statement, will more than take care of the balance due on your July account.

We trust that there will be no further confusion in your account. Yours truly.

PENMANSHIP. (Time, 1 hour.)

1. Write one page of General Movement Exercises, including the left oval, right oval, and drive-and-return (push-and-pull). One-space and two-space exercises should be shown. Use your own judgment as to selection and arrangement.

2. Write one set of capital letters, one set of small letters, and two sets of figures.

3. Write a brief business letter ordering goods from a local firm.

4. Write the following addresses as you would write them on business envelopes:—

   C. J. Brown and Company, Prince Rupert, B.C.
   Messrs. Evans and Manning, 458 Broad Street, Victoria, B.C.
   Miss D. K. Mitchell, Fernie, B.C.
   Rev. O. S. Paul, 156 Ninth Street, New Westminster, B.C.

5. Make one copy of the following:—

WHY TRY TO BECOME A GOOD PENMAN?

The first reason we shall give is this: We use our pens to express our thoughts in a social or in a business way, and we owe it to the people who read our letters that our writing should be legible and pleasing in appearance. This is surely just as important as it is to "say" it nicely if we were talking instead of writing to them. We should feel very much humbled indeed if we made mistakes in Grammar or in Spelling, and surely it is just as important that our writing should be good.

Again, it is a great satisfaction to be able to write rapidly and well, and not feel that we have to apologize for our writing. To be a poor penman is no evidence at all of greatness, but is one of the greatest handicaps a young person can have.

Perhaps the most important of all reasons, and the one that may appeal to you the most, is the fact that, other things being equal, the young man or young woman who makes the most rapid advancement in the business world of to-day is the good penman. Heads of business firms, department stores, banks, telegraph companies, etc., all tell us over and over again that they reject many applicants merely on account of their poor handwriting and that good writers receive rapid promotion.

I think we shall agree then that it is worth while to make an effort to bring our penmanship up to a high standard, for no matter what our vocation in life, it will be one of our strongest assets.

SHORTHAND DICTATION.

[NOTE TO PRESIDING EXAMINER.—*Please provide candidates with plain white letter paper.*]

[NOTE.—*The Examiner will read each section twice; first, rapidly, and secondly, at the rate assigned. Candidates will write at the second reading only. When all the dictation has been given, the candidates will make, in proper form, either a typewritten or a pen and ink transcription of their notes. The time taken by each candidate for making the transcription will be noted by the Presiding Examiner. Both shorthand notes and transcription are to be handed in.*]

Rate, 80 per minute.

Value.

12 1. Dear Madam: In the mail this morning we received your letter of December 20 enclosing a cheque for $200, (20) payable at the Century Trust Company, to retire your note due December 28.

The note will be returned to (40) you as soon as we receive it from the bank. This will be on December 28 or the following (60) day.

We thank you for taking care of this item so promptly and hope to receive another large order soon (80). Yours very truly.

Rate, 90 per minute.

14 2. To Patrons: At the close of my third year in business I am glad to announce that its success has warranted the (22) enlarging of my office. This will give my patrons more private as well as more spacious accommodation.

I have added a very good (45) selection of old English Silver, which has just been received from London.

Personal attention will be given to the matching of pearls (67) for necklaces.

Folders describing combination of precious stones and the newest effects in jewellery will be submitted gladly upon request. Very truly yours (90).

Rate, 100 per minute.

16 3. Dear Madam: We have received the waist you returned to us for credit and regret exceedingly that we are compelled to send it back to (25) you. Our records show that this waist was purchased September 25. As it has been out of our establishment for six weeks, it cannot (50) be accepted, for it is one of our rules that merchandise must be returned for either credit or exchange within ten days from the date (75) of purchase. We are sure that you will see the necessity for a rule of this kind.

Your further orders will be received with pleasure (100). Very truly yours.

Rate, 110 per minute.

18 4. Dear Sir: Referring to claim No. 6615L and the attachments, I call your attention to the fact that the shipments in question were covered (27) by one bill of lading, and that the weight shown on this claim was an overflow on the remaining shipment and should therefore be forwarded at carload rate (55) and actual weight.

Value.

I think that if you will review the facts in this case you will agree that your company should assume its proportion on the (82) actual weight of 16,880 pounds. The amount due from your company on that basis is $4.07, as shown. Will you please approve a (110) claim for that amount? Yours truly.

Rate, 120 per minute.

20 5. Dear Sir: Our shipping department will remain closed from December 31 to January 5 for our annual stock-taking. We will, however, be able to fill a few rush orders (30) on January 4.

Please do not overlook the fact that January is one of the best music-roll months of the year. Many people stay at home and use their player (60) pianos during the winter. Moreover, the Christmas season always introduces a large number of these instruments into homes, and people who have recently acquired player pianos are very likely (90) to be good customers for music rolls.

Your stock is probably very low. Between Christmas and New Year's is a good time to prepare a stock order for shipment early (120) in January. Very truly yours.

Rate, 130 per minute.

20 6. Dear Mr. Coleman: Recently I had the pleasure of inspecting the fine trees on your estate at Brentwood.

I was particularly interested in the Oak directly west of the Mansion. This tree (32) is in a very serious condition, so serious in fact that there is grave doubt whether it can be saved at all. I made a very careful study of its condition and believe (65) I can make some suggestions that may save it for you. I expect to be at Brentwood again within a week or so, and if it is your pleasure will explain in (97) detail just what should be done.

There will be no charge for any service I may render, nor will it place you under any obligation to the Tree Surgery Company. Very truly yours (130).

LAWS OF BUSINESS. (Time, 2 hours.)

6 1. (*a.*) X sells a piano to Y for $350, but doubting his ability to pay asks Z to become his surety. Z replies, "Certainly! He's able to pay. If he does not pay you I will see that you are paid." Y fails to pay. Can X collect from Z? Discuss, and quote the clause of the Act as authority for your answer.

6 (*b.*) A signs a note at 60 days for $140 favour of B. C signs the note as surety. Write the note. When the note becomes due A asks B to extend the time three days. B consents. A then fails to pay. Can B collect from C? Discuss fully and give other changes which will have the same result.

2. J. Adams sells W. Brown one Underwood Typewriter, Number 226495, for $250, payable in ten monthly instalments with interest at 8% per annum, the first of such payments to be made on July 1st, 1923. Adams asks you to draw a note which will enforce these terms and also give him the right to get possession of the machine if Brown fails to meet his payments.

7 (*a.*) Write the note, so wording it that it will be negotiable.

6 (*b.*) If Brown fails to pay, what legal steps must Adams take to secure payment?

3. W. Brock draws a draft on J. Condon for $240 at 60 days' sight favour of M. Dunn. It is accepted qualified as to time and has been negotiated and endorsed as follows:—

(1) In "blank" to W. Elliott, (2) "Qualified" to J. Ford, (3) In "full" to H. Gunn, (4) "Waiving protest" to W. Hill, and (5) "Restricted" to you.

7 (*a.*) Show the draft, face and back.

Value.

5 (*b.*) Name the parties in the order of their liability.

6 (*c.*) If the draft becomes overdue in your hands state in order the steps you would take to protect your title.

9 4. (*a.*) Describe clearly the nature of the title to the property of the mortgagor and the mortgagee in (1) A chattel mortgage, (2) A mortgage on real property, and (3) The vendor and vendee in a Lien Note.

8 (*b.*) A holds a mortgage for $2,000 on Lots 121-122, Block 526, Subdivision D, District Lot 54, Map S, of the City of Vancouver. He offers to sell it to you. State in order the steps you would take to assure yourself that his title is good.

6 (*c.*) Explain the *legal* effect of the "Personal Covenant" in a mortgage.

5. A rents a house from the Permanent Realty Co., agreeing to pay $50 a month. He pays a month's rent on Jan. 1, 1923, and occupies the house.

5 (*a.*) On Jan. 23rd his furniture is damaged from frozen water-pipes. Can he collect damages from the company? Discuss.

5 (*b.*) On March 1st he pays the taxes, $65. Can he withhold this from the rent? Why?

5 (*c.*) Having paid the rent on May 1st can he move out on May 31st? Discuss fully.

6. Anderson, Brooks, Carver and Davis form a copartnership and sign a partnership agreement in which Anderson becomes a "general partner," Brooks a "nominal partner," Carver a "limited partner," and Davis a "dormant partner."

8 (*a.*) Explain fully the powers and limitations of each partner.

5 (*b.*) Carver and Davis while on a pleasure trip take advantage of a bargain and buy a stock of goods for the firm. What legal effect would this action have on the partners?

6 (*c.*) Anderson wishes to retire from the partnership. How may this be accomplished? Can the other partners carry on the partnership without him? Explain.

Statute Law. (Time, 2 hours.)

12 1. To whom would you write for a copy of the Bills of Exchange Act?
Tell exactly what you mean by the "Statutes."
Are all our laws in the statutes?
What, in addition to "making laws," does a government do? How does the Bills of Exchange Act define the following: (*a*) A bill of exchange; (*b*) an inland bill of exchange; (*c*) a cheque; (*d*) a promissory note?

10 2. "*One* draft pays *two* debts."
Draw a draft payable 60 days after date and accepted 6 days after date. Explain what two payments are made by it.

10 3. To what extent is each of the following liable for the full payment of the instrument: (*a*) The maker of a note; (*b*) the drawer of a draft; (*c*) the acceptor of a draft; (*d*) an endorser of a note; (*e*) an endorser of a draft?

12 4. Explain clearly the difference between *negotiability* and *assignability* as applied to bills and notes.
What restrictions are placed on the negotiation of *overdue* notes?
How does the Bills of Exchange Act define a *holder in due course?*
If a note or acceptance is not paid on maturity, what steps must the holder take?
How does the Statute of Limitations apply to bills and notes?

Value.

20 5. What is the purpose of Joint Stock Company organization?
Explain, briefly but clearly, how a company must be organized in British Columbia.
What information must be given to the government at the time of organization?
What business records must be kept by the company?
What information must be submitted to the government annually?
What provision is made whereby shareholders can "keep in touch" with the affairs of the business in which they hold stock?
What class of companies must obtain Dominion charters?
What are the advantages of Joint Stock Company incorporation?
Why should a government legislate in reference to company organization and management?

12 6. What are the directors of a Joint Stock Company?
What qualifications must they have?
How are they appointed?
What are their duties and powers?
How may they become *personally liable?*
How can this personal liability be avoided?

12 7. Give, preferably in tabular form, the position of each of the following in respect to (*a*) sharing of profits and losses, (*b*) liability to creditors, (*c*) authority and management: General partners, limited partners, holders of common stock, holders of preference shares, bondholders.

12 8. What is meant by the following terms as used in the Companies Acts: *Prospectus, promoter, registered office,* company *limited, call, statutory meeting, proxy, extra-provincial company, watered stock, cumulative stock, liquidator?*

ACCOUNTANCY PRACTICE. (Time, 3 hours.)

[NOTE TO PRESIDING EXAMINER.—*Please provide candidates with Journal, Cash leaves with Five Columns, and Ledger paper.*]

Value.

10 1. On May 30 you sold J. O'Connor goods invoiced at $180, terms 2½% off in 10 days, net in 20 days, and on June 1 you sold J. A. Hyslop goods invoiced at $220, terms 2½% off in 10 days, net in 30 days. On June 10 you drew on J. A. Hyslop at 10 days and on J. O'Connor at 20 days. You left J. A. Hyslop's draft at the bank for collection; and you discounted J. O'Connor's draft at 7% and deposited the proceeds. Draw the drafts as they appeared when left at the bank and give complete journal entries.

10 2. The following is a summary of Brown and Jones' Balance Sheet:—

Cash	$ 200	Acc. Pay.	$1,200
Bank	1,600	Bills Pay.	800
Acc. Rec.	2,400	Brown—Cap.	2,000
Bills Rec.	1,800	Jones—Cap.	3,220
Mdse.	1,000		
Off. Furn.	220		
	$7,220		$7,220

They form a Joint Stock Co. with authorized capital of $10,000. Brown is to receive $2,200 fully paid capital stock and Jones $3,400 fully paid capital stock. Ames, Lacy and Burton subscribe for $1,000 of stock each and pay 50% of subscription in cash. Show the Balance Sheet of the new Joint Stock Co.

Value.

20 3. Enter the following items in a cash journal which has special columns for Bank, Acc. Rec., Acc. Pay., and Cash Discounts:—

(1.) Cash in hand $50.60 and in Bank $1,240.

(2.) J. White pays $60 on account by cheque.

(3.) T. Moore pays invoice of $260 less 2% by cheque.

(4.) We deposit Moore's cheque less ¼% exchange and cash White's cheque, no exchange.

(5.) We pay Mason & Co.'s invoice $120 less 2½% by cheque.

(6.) We pay sundry items of expense $12 cash.

(7.) We pay O. Jones on account cash $50.

(8.) M. Knox pays his note due to-day by cheque $75.

(9.) Discount J. McKay's note at Bank and deposit proceeds, face of note $80, discount 60c.

(10.) We pay freight on desk for the office $3 cash.

(11.) M. Scott pays invoice of $60 less 1½% by cheque.

(12.) We deposit cheques on hand, exchange on each ¼%, and also all cash except $25.

Close Cash Journal. Post and take off Trial Balance.

4. Journalize:—

2 (1.) Book debts are $2,400. Provide a 2¼% reserve for Bad Debts.

3 (2.) Draw on J. C. Carr for invoice $180 less 2% and discount draft at Bank, discount 75c., exchange ¼ of 1%. Deposit proceeds.

3 (3.) Draft on J. C. Carr above is dishonoured. Protest charges $5 have been charged your account.

3 (4.) You have paid invoice of $600 less 2% to W. McDonald & Co., but on receipt of the goods you find there is a shortage of goods invoiced at $50.

4 (5.) Authorized Capital is $100,000, Subscribed Capital is $75,000, and Paid-up Capital is $50,000. A further subscription of $15,000 capital is received and later a call of 10% on all subscribed capital is paid in cash.

5 (6.) You render Account Sales to A. Producer showing total proceeds of $260 and charges as follows: Cartage, $4.50; freight, $12.60; repairs, $2.60; storage, $5; and commission, 5% on sales. You forward cheque $150, balance on account.

40 5. From the following prepare Trading, Profit and Loss, and Assets and Liabilities statements:—

Cash in hand	$ 220	
Cash in Bank	8,600	
Acc. Rec.	4,200	
Acc. Pay.		$ 2,600
Bills Rec.	1,600	
Bills Pay.		2,100
Mdse. Inv. Jan. 1	16,200	
Purchases	50,800	
Sales		60,400
Purch. Returns		150
Sales Returns	80	
Profit and Loss		190
Gen. Expense	820	
Off. Salaries	3,400	
Off. Furniture	400	
Wages	1,200	

Advertising	$ 1,000	
Freight in	250	
Duty	120	
Delivery	300	
Int. & Disct.	60	$ 80
Purch. Disct.		550
Sales Disct.	120	
Rent	1,080	
Light & Heat	620	
Capital (Paid up)		25,000
	$91,070	$91,070

Inventories Dec. 31—Goods on hand $16,600. Interest accrued on Bills Rec. $32 and on Bills Pay. $40; Rent due but not paid $20.

Write off 5% of Off. Furniture and provide a 2% Reserve for Bad Debts on Acc. Rec. and Bills Rec. Appropriate for a 4% Dividend and set aside $500 for Reserve Acc. leaving balance to Cr. of Profit and Loss.

ACCOUNTANCY THEORY. (Time, 2 hours.)

[NOTE TO PRESIDING EXAMINER.—*Please provide candidates with plain white paper.*]

Value.

15 1. In making a Statement of Assets and Liabilities, what information would you obtain from a Single Entry Ledger? How would you obtain other requisite information? Show a Balance Sheet as made from books of Single Entry, and give journal entry to change to Double Entry.

10 2. At the end of a financial year a firm has met with no bad debts. It is decided, however, to write off a certain percentage of Accounts Receivable as Reserve for Bad Debts. How would a fairly accurate estimate be made as to what this percentage should be? Illustrate by figures.

10 3. You are to audit the books of your High School Athletic Association. What books and vouchers would you expect to have handed over to you? If some vouchers should be lacking or should not be satisfactory to you, what would you do to assure yourself of the truth in the matter?

15 4. Make an Interest and Discount Account showing a debit of $60 and a credit of $80. Enter an asset inventory of $4.20 and a liability inventory of $8.75; then close the account and leave it ready for entries of the ensuing period.

Explain fully the debit and credit of these inventories (1) for the period just passed and (2) for the period to come.

10 5. What is the purpose of a Sinking Fund? How is a Sinking Fund Account opened and how is it closed? During the continuance of the account on the books where would it appear in the Balance Sheet?

10 6. Tell in a general way what you understand by Cost Accounting? What are the items of cost that enter into Manufacturing Account? Rule an account and show cost of manufacturing.

10 7. Rule a Share Ledger suitable for a Joint Stock concern where the shares are not fully paid as yet and where transfers of stock occur from time to time. Make a few entries to illustrate.

10 8. Rule a three-column ledger as on a card form. Enter the heading of the account and make three entries. What are the advantages of this form and to what lines of business does it specially lend itself?

10 9. Give reasons for dividing the Ledger. Show how the Sales Ledger may be made self-balancing.

Third-year Course, Technical.

TRIGONOMETRY. (Time, 2 hours.)

[*N.B.—Tables and squared paper are provided.*]

Value.

16 1. (*a.*) Define the cosine of an angle.

(*b.*) Find the secant of the angle whose tangent is $-\frac{1}{2}$.

(*c.*) Draw the angle whose sine is $\frac{1}{\sqrt{3}}$.

(*d.*) If $\sin A = \frac{2}{3}$, find $\sin 2A$ and $\cos 2A$.

16 2. On the same axes sketch the graphs of the following : $y = \cos x$; $y = 2 \sin x$. Indicate BRIEFLY how you would draw $y = 2 \sin x - \cos x$.

14 3. In every triangle ABC show that :—

(*a.*) $\cos A = \dfrac{b^2 + c^2 - a^2}{2bc}$.

(*b.*) $\dfrac{a-b}{a+b} = \tan\frac{1}{2}(A - B) \tan\frac{1}{2} C$.

14 4. By using a formula adapted for logarithmic calculation solve the triangle whose sides are 521, 381, 418 units respectively.

12 5. A rectangle ABCD turns in its own plane round B through an angle θ. Prove that the distance of D from its original position is $2\sqrt{a^2+b^2} \sin \frac{1}{2}\theta$ when $AD = a$, $AB = b$.

14 6. Two straight roads diverge at an angle of 35°. An automobile starts from the fork in the road and runs 2.1 miles along one road when a cross-road is reached. It turns into the cross-road and after running 1.4 miles comes to the other road. How far is the automobile from the starting-point?

14 7. Three forces of 5, 6, 7 lb. weight respectively are acting at a point and are in equilibrium. Find the angle between the smallest and the largest force.

ELECTRICITY. (Time, 2 hours.)

[*Questions are of equal value. Answer* eight *only.*]

1. Write a brief account of the modern theory of electricity.

2. Explain, with sketches, the winding of *series, shunt,* and *compound-wound dynamos,* specifying for what purpose each is most suited.

3. How would you determine the *magnetic declination* and the *magnetic inclination* of your city?

4. Describe a Daniell cell and show how local action and polarization are overcome.

5. State Faraday's laws of electrolysis. Describe an experiment to determine the electrochemical equivalent of copper.

6. Describe, with sketch, an *induction-coil.*

7. A circuit consists of .5 ohms, 10 ohms, and 3 ohms connected in parallel. What is the combined resistance? A potential of 110 volts is applied to the terminals of such a circuit. What current will flow? How will this current be divided among the various branches?

8. Define carefully: Permeability, induction, saturation, hysteresis, Lenz's law.

9. Write, with sketch, a short account of the method of measuring the candle-power of electric lamps.

10. Show by examples that you understand the use of vector diagrams and sine curves in the study of alternating currents.

MECHANICS. (Time, 2 hours.)

[*Questions are of equal value. Answer* eight *only.*]

1. Define the term "elasticity." Use the following data in your answer:—

Load.	Reading.	Stretch.
0	.010	0
10	.090	.08
20	.165	.155
30	.250	.240
0	.010	.000

2. Write a short account of "bending" as applied to beams.

3. Describe in detail any form of "micrometer" you have used. Give clear sketches.

4. In an hydraulic press an effort of 35 lb. is exerted on the end of a lever whose leverage is 14. Plunger diameter, 1⅛ inches; ram, 10 inches; efficiency of press, 90%. What pressure will be exerted on the ram?

5. A cast-iron body of weight 56 lb. is suspended by a string and wholly immersed in water. Find the upward force on the weight and the tension of the supporting string. (Specific gravity of iron=7.2.)

6. A traction engine weighs 8 tons and is capable of drawing 30 tons along a level road. What will it pull up a road which is inclined at 1 in 100? (Coefficient of traction, .02.)

7. The diameter of the piston of an engine is 20 inches; mean steam-pressure is 60 lb. per square inch; length of stroke is 30 inches; revolutions per minute, 20. It is found to raise 100 cubic feet of water per minute to a height of 80 feet. What is the efficiency of the engine?

8. (*a.*) Give the theory of the differential wheel and axle.
(*b.*) A wheel 4 feet in diameter revolves 100 times per minute. Find its angular velocity.

9. Give the theory of the screw-jack by principle of work. If P is 30 lb., W is 2 tons, leverage of P is 20 inches, find pitch of screw. (Efficiency of jack is 35%.)

10. Describe, with sketches, the suction-pump, force-pump, double-action force-pump.

WOOD AND METAL WORK—THEORY.

WOODWORK. (Time, 1½ hours.)

[*Answer the three questions.*]

Value.

10 1. Draw the plan of a hipped roof, making the drawing about 6″ by 4″. Letter and name the following members: Purlins, jack rafters, common rafters, ridge.

25 2. Describe fully how you would obtain the lengths and bevels of the rafters by the steel square. Refer to the arms of the square as the blade and tongue.

15 3. Make a front elevation drawing of a small window 2′ 6″ high. Decide on a suitable width and design the casings for same. Scale $^1/_{10}''=1'$.

METALWORK. (Time, 1½ hours.)

[*Answer the four questions.*]

Value.

20 1. Explain carefully how you would proceed to cut 10 threads per inch on work between centres, if the lead-screw of the lathe had 4 threads per inch.

5 2. Name the following parts of the lathe from the accompanying blue-print: A, B, C, D, E, F, G, and H.

(Blue-print attached.)

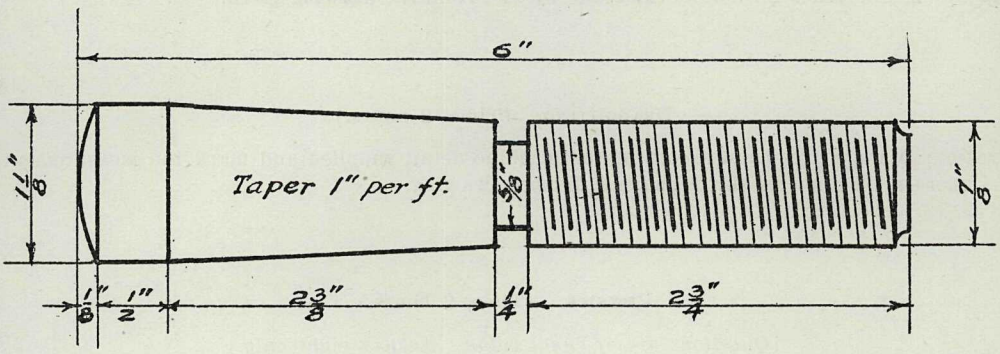
10 3. Explain how you would proceed to solder (*a*) tin plate, (*b*) galvanized iron. Describe tools and materials used and explain why they are used.

15 4. Tell what you know about annealing carbon steel.

PRACTICAL MACHINE-WORK. (Time, 2 hours.)

50 1. The working drawings for the year should be placed in a folder and laid on your bench. These will be collected and marks awarded.

50 2. From stock supplied make problem to specified measurements.



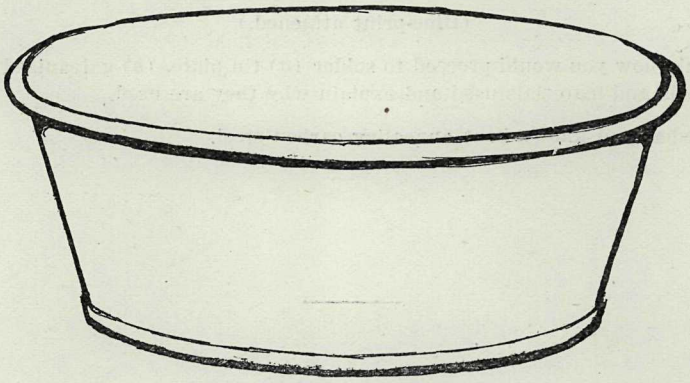
8 Threads U.S.S. R.H.
Measurements for width + .002

PRACTICAL SHEET-METAL WORK. (Time, 2 hours.)

Value.

50 1. The working drawings for the year should be placed in a folder and laid on your bench. These will be collected and marks awarded.

50 2. Develop the pattern and construct a flaring pan as illustrated. Diameter of top, 6¼"; diameter of bottom, 4¾" height, 2⅝". A No. 12 wire to be enclosed in the top edge. Bottom to be double-seamed to the body.



PRACTICAL WOODWORK. (Time, 3 hours.)

50 1. The working drawings for the year should be placed in a folder and laid on your bench. These will be collected and marks awarded.

50 2. Construct a window-frame, 20" by 14", from the drawing given.

DRAUGHTING. (Time, 2 hours.)

Project: Make a free-hand sketch of the machine detail supplied and mark the measurements thereon. From this sketch make a finished drawing.

PHYSICS. (Time, 2 hours.)

[*Questions are of equal value. Answer* eight *only.*]

1. Describe very carefully and give sketches of the way in which sound is transmitted through air.

2. The velocity of sound through wood is much greater than through air. Why? How has the velocity of sound through wood been determined?

3. What is meant by refraction? How would you proceed to measure the refraction ratio of air and glass? What is this ratio called?

4. Prove the principal focus of a very small segment of a spherical concave mirror of very small curvature to be sensibly midway between the surface of the mirror and its centre.

5. Explain what is meant by the *mechanical equivalent of heat*, and describe one method by which it has been determined.

6. (*a.*) State Newton's three laws of motion.
   (*b.*) From the second law derive the force equation.
   (*c.*) Define "*Poundal*," "*Dyne*."

7. Describe the construction and theory of a mercury barometer. Find height of barometer when liquid used has a density of .8.

8. If 98 gm. of metal are heated to 100° C. and then dropped into 120 gm. of water at 10° C. the resulting temperature is 16° C. Find the specific heat of the metal.

9. (*a.*) How would you determine in the laboratory the refractive index of a block of glass?
   (*b.*) Define *refractive index* of a medium.
   (*c.*) Define *critical angle.*

10. Write a short essay on the changes in volume and quantity of heat involved in each step as a gram of steam at 100° C. and 760 mm. pressure is cooled to —10° C.

Geometry. (Time, 2½ hours.)

Value.

10 1. If all the sides of a convex rectilineal figure are produced in order, the sum of the exterior angles is four right angles.

11 2. Equilateral triangles ABH, ACK are described on AB, AC sides of a triangle ABC, externally to the triangle. Show that CH = BK.

11 3. Show that if two circles touch one another the point of contact lies on the line joining their centres, or on that line produced.

11 4. Given a map 3 inches to the mile, explain how to construct a corresponding map 2 inches to the mile. Make a neat diagram to illustrate your method.

13 5. From the following extract from a surveyor's field-book draw a plan to the scale 2 inches to 1 chain and find the area in acres:—

	Links.	
	To D.	
	260	
	115	28 to C.
	90	72 to B.
To E 112.	40	
	From A.	

12 6. Four circular coins of different sizes lie on a table, and each touches two and only two of the others. Show that the four points of contact lie on a circle.

11 7. A circular arch over a stream rises 3 feet at its highest point above the level of the top of the vertical piers. If the distance between the piers is 20 feet, find the radius of the circle of which the arch forms a part, and draw a diagram to scale.

10 8. Draw a figure showing how a piece of paper must be cut and folded in order to make a pyramid whose base is a rectangle of length 3 inches and breadth 2 inches, each lateral edge being 2½ inches.

11 9. AB, a side of a triangle ABC, is fixed in magnitude and position. The vertex C moves on a fixed line AX. Find the locus of the orthocentre of the triangle ABC. (The orthocentre is the point of intersection of the three perpendiculars drawn from the vertices of a triangle to the opposite sides.)

CHEMISTRY. (Time, 2 hours.)

[*Questions are of equal value. Answer* eight *only.*]

1. Describe the manufacture of sulphuric acid.
2. If 2,000 kilograms of limestone are placed in a lime-kiln and heated, how much quicklime is produced? What volume of carbon dioxide at N.T.P. is produced?
3. How many litres of hydrogen at N.T.P. can be got by acting on 12 gm. of iron with sulphuric acid?
4. Give the Le Blanc and Solvay's processes for the manufacture of sodium carbonate.
5. How would you test for the following:—
   (*a.*) *Chlorine,* carbon dioxide, a sulphate, a chloride, a nitrate?
   (*b.*) Give equations.
6. If 0.53 grams of magnesium when burned in air produce 0.88 grams of magnesium oxide, calculate a combining weight for magnesium, if that of oxygen is 16 grams.
7. How is hydrochloric acid produced on a large scale?
8. Write names for the substances represented by the following formulæ: $NaCl$, K_2O, NH_3, N_2O_2, P_2O_5, $HClO$, $NaNO_2$.
9. Calculate the weight of hydrogen in a vessel of 10 litres capacity filled at 756 mm. pressure and a temperature of 18° C.
10. Define clearly: Atomic weight, acid, alkali, compound equation, formula, crystallization.

ARITHMETIC AND ALGEBRA. (Time, 2½ hours.)

[*N.B.—Mathematical tables and graph paper are provided.*]

Value.

12 1. (*a.*) Compute, by *contracted* multiplication and division, the value of $3.214 \times 0.7423 \div 79.37$.

(*b.*) Find the percentage of glycerine in a mixture of glycerine and water if 1 cu. cm. of mixture weighs 1.215 grams, given 1 cu. cm. of water weighs 1 gram, and 1 cu. cm. of glycerine weighs 1.264 grams.

12 2. Factor the following expressions:—

(*a.*) $a^2 + 9a - 52$.
(*b.*) $ax^3 - 4a^3x$.
(*c.*) $(a^2 + b^2 - c^2)^2 - 4a^2b^2$.
(*d.*) $a^2 - a(2b - 3c) - 6bc$.
(*e.*) $x^3 - 2x + 1$.
(*f.*) $a^3 + b^3$.

12 3. Solve the equations:—

(*a.*) $\dfrac{x}{x-1} + \dfrac{x-1}{x} = 4$.

(*b.*) $3x + 2y = \dfrac{2}{x} + \dfrac{1}{y} = -1$.

Value.

12 4. If $y = ax^{\frac{3}{2}} - bx^{\frac{5}{2}}$ and $y = 5{\cdot}82$ when $x = 0{\cdot}51$, and if $y = 32{\cdot}10$ when $x = 0{\cdot}98$, find a and b.

12 5. (*a.*) Find the value, correct to 3 decimal places of $\left(x - \frac{1}{x}\right)$ when $x = \sqrt{3} + 1$.

(*b.*) If $S = 4\pi R^2$, and $V = \frac{4}{3}\pi R^3$, express S in terms of V.

12 6. A pipe whose cross-section is 12.5 square inches is delivering 100 tons of water per hour. If 1 cubic foot of water weighs $62\frac{1}{2}$ lb., find the volocity at which the water emerges from the pipe. (1 ton = 2,240 lb.) Your answer must be expressed in feet per second.

[NOTE.—*You may omit* one *of the following questions.*]

14 7. L is the latent heat of steam at a temperature of $\theta°$ C. Find from the following results of experiments the formula giving L in terms of θ:—

θ	75	90	100	115	125
L	554	544	536	526	519

14 8. A is the area in square yards of the cross-section of a railway cutting at the distance x yards along the railway from a certain point.

x	0	30	60	90	120	150
A	110	120	143	125	112	95

What is the approximate volume in cubic yards which must be removed from $x = 0$ to $x = 150$?

14 9. Suppose you have reason to believe that the relation between two sets of observed values of x and y is of the form $y = ax^n$ where a and n are constants. How would you test your supposition? How would you find a and n?

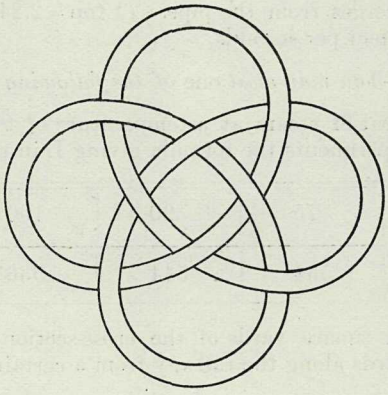
Third-year Course, Household Science.

DRAWING AND DESIGN. (Time, 2 hours.)

Value.

50 1. The drawings for the year should be placed in a folder and laid on your desk. These will be collected and marks awarded.

50 2. With the geometrical construction given below as a basis and any other forms you may consider appropriate and pleasing, make a design for a lady's handbag (12″ by 8″) to be decorated by embroidery. Show the character of the stitchery and the colour scheme.



COOKERY—THEORY. (Time, 2 hours.)

3 1. Give your method for preparing fruit-jars for use in the hot-pack method. Mention the type of jar you are preparing.

2. Mention the principal points to observe in jelly-making under the following headings:—

3 (*a.*) Choice of fruit, with reasons.

2 (*b.*) Amount of water to use.

3 (*c.*) Cooking the fruit-juice after straining

3 (*d.*) Sealing.

3. What cut or cuts of meat are most suitable for the following:—

1 (*a.*) A jellied soup stock;

1 (*b.*) Pot roast;

1 (*c.*) Oven roast?

5 4. Describe how *one* of the foods mentioned in question 3 would be cooked and give reasons for the method. Mention the size of the cut and how many persons it would serve.

10 5. Describe your method for preparing, cooking, and serving *two* of the following:—

(*a.*) Spinach.

(*b.*) Carrots.

(*c.*) Beets.

Value.

5 6. Write a complete recipe for *one* of the following for serving six adults:—
(*a.*) Cream of carrot soup.
(*b.*) Chocolate corn-starch mould.
(*c.*) Tapioca cream.
(*d.*) Baking-powder biscuits.

5 7. Describe your method and give reasons for it in *one* of the following:—
(*a.*) Eggs soft-cooked in the shell.
(*b.*) Setting bread.
(*c.*) Baking custards.

3 8. (*a.*) Name the types of baking-powders in common use and give an example of each.
5 (*b.*) Discuss their use from a health standpoint.
50 Marks for practical work.

TEXTILES, DRESSMAKING, AND MILLINERY. (Time, 2 hours.)

TEXTILES.

4 1. Give the characteristics of wool and silk.
(*a.*) Of what use is a knowledge of the characteristics when purchasing materials?

4 2. Explain the methods of adulteration of cotton, linen, silk, and wool.

4 3. How may adulteration in silk and wool be detected?

DRESSMAKING.

3 4. (*a.*) Explain how standard commercial patterns should be used and how adapted to the individual garment.
2 (*b.*) Give the relative values of the drafted pattern and a standard commercial pattern.

5 5. How would you prepare a plain separate skirt and a plain separate waist with a set-in sleeve for a fitting?

15 6. Make a free-hand sketch of a costume which you consider suitable for a high-school girl or a business girl. Design should have individuality in construction and trimming. Give details of material, colour, trimming, and any explanation which would be necessary to give a clear idea of the finished garment.

MILLINERY.

7 7. Explain the making of a buckram brim.
(*a.*) How is it made to turn up or down?

2 8. Give directions for putting a smooth taffeta facing on a flat brim.

4 9. What should each individual consider in selecting a hat?

50 Marks for practical work.

CHEMISTRY. (Time, 2 hours.)

Value.

18 1. (*a.*) Give an explanation of the following equations in terms of the atomic theory:—

$CaC_2 + 2\,H_2O = Ca(OH)_2 + C_2H_2$.

$2\,NaNO_3 = 2\,NaNO_2 + O_2$.

$CaO + CO_2 = CaCO_3$.

(*b.*) Name the different substances represented in the foregoing formulæ, pointing out the meaning of any significant prefixes and suffixes you may use in the different names.

(*c.*) What kind of chemical change is represented in each of the last two equations?

15 2. What are the three general methods of removing fat-stains from fabrics? Describe each process in detail, indicating how the different cleansing agents act upon the fat.

15 3. What is *lustracellulose?* Mention the different processes of preparing it, and describe any *one* process fully.

12 4. Give the method of preparation and the properties of ammonia. Write equations to show what occurs when (1) ammonia gas reacts with nitric acid, (2) ammonia solution reacts with sulphuric acid.

12 5. What purposes are served by the mercerization of cotton? Give a description of the process.

18 6. Discuss the theory of ionization.

10 7. Explain the following terms: Acid radicle, valence, combustion, salt, basic oxide.

PHYSIOLOGY, HYGIENE, AND HOME-NURSING. (Time, 2 hours.)

7 1. Write a comprehensive note on the location, general structure, function, and hygiene of *one* of the following:—

(*a.*) Tonsils.

(*b.*) Kidneys.

(*c.*) Lungs.

3 2. (*a.*) Name the health habits most necessary to follow in order to keep the body efficient.

3 (*b.*) At what age is it best to form health habits? Give reasons for your answer.

5 3. Discuss *one* of the following:—

(*a.*) Shoes for general wear.

(*b.*) Clean garments.

(*c.*) Bathing.

(*d.*) The use of face-creams and face-powder.

7 4. Describe, with diagrams, the structure, function, and hygiene of the eye *or* the ear.

HOME SANITATION.

5 1. Write a note on bacteria under the following headings:—

(*a.*) History and general description as to shape, size, method of growth, and multiplication.

(*b.*) Explain the relation bacteria have to home sanitation.

Value.

5 2. Write upon *one* of the following:—

(*a.*) The care of gas-range.

(*b.*) The care of the refrigerator.

(*c.*) The care of the basement or cellar.

(*d.*) Disinfectants in the home.

(*e.*) The kind, amount, and disposal of kitchen garbage in your own home.

HOME-NURSING.

5 1. Write on *one* of the following:—

(*a.*) The transfer of disease and how disease may be prevented.

(*b.*) Common colds—their prevention and home treatment.

(*c.*) Tuberculosis of the lungs—its prevention, general symptoms, and treatment.

5 2. Write on *one* of the following:—

How to detect and deal with: (*a.*) Ringworm. (*b.*) Pediculosis. (*c.*) Adenoids. What steps would you take to prevent the trouble?

50 Marks for practical work.

DIETETICS. (Time, 2 hours.)

6 1. Discuss the following:—

(*a.*) The relation of physical work to food requirement.

6 (*b.*) The relation of mental work to food requirement.

4 2. What are the chief points for consideration in determining the value of any food as an article of diet?

12 After each point give your reason why it should be considered in determining food value.

9 3. (*a.*) Make a list of *six* common food materials that would be placed under the following headings:—

Tissue building foods.
Fuel foods.
Foods valuable for vitamines A, B, and C.
Two foods noted for each vitamine.

6 (*b.*) Discuss the use of one of the above food groups in the diet.

18 4. Discuss the source and use of *three* of the most important mineral elements in foods.

18 5. Discuss *three* of the following food habits:—

(*a.*) Eating meals very quickly with little or no table talk.

(*b.*) The use of commercial soft drinks as a beverage between meals.

(*c.*) The use of candy or sweets of a like nature.

(*d.*) The use of chewing-gum.

(*e.*) Very little or no leafy vegetables and few roots in the diet.

8 6. State what would be a fair allowance of meat and milk for one week for the following family: Man (school-teacher); woman (home mother); girl (high school, age 15); boy (Grade VII., age 13); girl (age 4).

Mention your authority for your answer.

Value.

7 7. Discuss *one* of the following:—

Food habits and suitable foods for a girl of 6 if she were: (*a.*) Ten pounds below average weight. (*b.*) Ten pounds above average weight.

6 8. Discuss *one* of the following:—

(*a.*) "The more one has to economize the more necessary it is to use the required amount of milk for the children."

(*b.*) "The use of commercially canned goods is very often a great extravagance."

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