

**FEDERAL PUBLIC SERVICE COMMISSION  
(Curriculum & Research Wing)**

**Schemes and Syllabi for Screening/Professional Tests as well as Descriptive Examination  
Relating to Posts Advertised under Consolidated Advertisement No. 05/2023**

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
1.	82/2023	<b>Secondary School Teacher (Female)</b> (BS-17), (A) Geography (B) Physics Federal Directorate of Education, Ministry of Federal Education & Professional Training.	Second Class or Grade 'C' Master's Degree/ Bachelor's degree (4 years duration) in relevant subject with 2 <sup>nd</sup> Class or Grade 'C' M.Ed./ B.Ed./ B.Ed. (Hons)/ Associate Diploma in Education or equivalent qualification from a University recognized by HEC.	Objective Type Test (MCQ)  <b>Part-I</b> English =20 marks  <b>Part-II</b> Subject Test = 50 marks  <b>Part-III</b> Professional Test=30 marks	<b>For (A) Geography</b> <b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring <b>Part-II (Masters Level)</b> <ul style="list-style-type: none"> <li>• Physical Geography</li> <li>• Factor of climate and environmental change</li> <li>• Geography of Pakistan,</li> <li>• Human Geography (Renewable Resources, Recycling Resources, Sustainable resources. The Demographic Transition)</li> <li>• Climatology/Metrology,</li> <li>• Environmental Geography,</li> <li>• GIS Techniques,</li> </ul> <b>Part-III</b> <ul style="list-style-type: none"> <li>• Teaching Techniques and Methodology,</li> <li>• Classroom Management and Discipline,</li> <li>• Testing and Evaluation</li> <li>• Knowledge of Bloom's Taxonomy</li> </ul> <b>For (B) Physics</b> <b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II (Masters Level)</b> <ul style="list-style-type: none"> <li>• Heat and Thermodynamics,</li> <li>• Waves and Optics,</li> <li>• Electrostatic,</li> <li>• Electricity and Magnetism,</li> <li>• Atomic and Modern Physics,</li> <li>• Basic Solid State Physics,</li> <li>• Electrodynamics,</li> <li>• Mechanics</li> </ul> <b>Part-III</b> <ul style="list-style-type: none"> <li>• Teaching Techniques and Methodology</li> <li>• Classroom Management and Discipline</li> <li>• Testing and Evaluation</li> <li>• Knowledge of Bloom's Taxonomy</li> </ul>

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
2.	83/2023	<b>Assistant Director</b> (BS-17), National Accountability Bureau.	At least Second Division Master's degree or 16 years education in Criminology/ Law/ Business Administration/ Economics/ Computer Sciences/ Defence and Strategic Studies from HEC recognized Institution/ University <b>OR</b> B.E/ B.Sc./ 16-years education in Civil/ Electrical/ Mechanical from HEC recognized Institution/ University.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> General Intelligence/ Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>▪ Basic Arithmetic <ul style="list-style-type: none"> <li>– Algebra</li> <li>– Ratios</li> <li>– Percentages</li> <li>– Arithmetic Means</li> </ul> </li> <li>▪ Current Affairs. <ul style="list-style-type: none"> <li>– Issues/Challenges at National and International Level during the last 5 years</li> <li>– Basic Economic facts related to Pakistan.</li> </ul> </li> <li>▪ Pakistan Affairs &amp; Islamic Studies <ul style="list-style-type: none"> <li>– Basic Level knowledge</li> </ul> </li> <li>▪ National Accountability Ordinance, 1999</li> </ul> <b>Note : (Equal weightage for each topic at Part-II)</b>
3.	87/2023	<b>Medical Officer</b> (BS-17), Border Health Services-Pakistan, Ministry of National Health Services, Regulations & Coordination.	MBBS or equivalent qualification recognized by PMDC.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>• Core courses of <b>MBBS</b> Degree Program.</li> <li>• Health Policies of the Government of Pakistan.</li> <li>• Care vs Cure for Health Management.</li> <li>• Major Challenges being faced by the Health Sector in Pakistan</li> </ul>
4.	89/2023	<b>Assistant Director (Software)</b> (BS-17), Ministry of Law and Justice.	Second Class or Grade 'C' Master's or Bachelor's (4 years duration) degree in Computer Science/ Information Technology/ Software Engineering or equivalent qualification from a University recognized by the HEC. OR Second Class or Grade 'C' Bachelor's degree in Computer Engineering/ Computer System Engineering or equivalent qualification from a University recognized by the PEC.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>• Object Oriented Programming</li> <li>• Latest Development Framework (Laravel, Rails, React, Angular)</li> <li>• Relational Database</li> <li>• Encryption and Decryption Techniques</li> <li>• Restful API's (SOAP/UDDI/WSD2)</li> <li>• Development of Software Applications for UNIX Platform</li> <li>• Software Quality Assurance/Testing</li> <li>• Archiving and Digitizing Techniques</li> <li>• Hybrid Software Applications Development</li> </ul>

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
5.	90/2023	<b>Assistant Director (Minerals)</b> (BS-17), Directorate of Mines and Minerals, Gilgit Baltistan, Ministry of Kashmir Affairs & Gilgit Baltistan.	Second Class or Grade 'C' Master's or Bachelor's (4 years education) degree in Geology/ Earth Sciences/ Mineralogy or equivalent qualification from a University recognized by HEC.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>• Geological exploration/prospecting.</li> <li>• Industrial rocks and minerals,</li> <li>• Radioactive minerals and rocks</li> <li>• Terms and definitions of mine workings.</li> <li>• Choices of mining methods and modes of extraction.</li> <li>• Structural controls in mining: bedding, faults, joints folds, fractures and intrusion.</li> <li>• Gases in mines, spontaneous combustion.</li> <li>• Rock pressure and support,</li> <li>• Factors affecting mine size grade and distribution of ore body,</li> <li>• Rock and soil mechanics</li> <li>• Rock mass characteristics;</li> <li>• Geological factors and strength of rocks;</li> <li>• Application of geophysical methods for site investigation;</li> <li>• Metallic and Non-metallic mineral resources of Pakistan.</li> <li>• Mineral-based industries.</li> </ul>
6.	92/2023	<b>Law Officer</b> (BS-17), ML&C Department, Ministry of Defence.	(i) LLB degree from a University recognized by the HEC. (ii) Two (2) years post qualification experience from Bar Council which shall be counted from the date when Advocate became member of any Bar Association.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>• Civil Procedure Code</li> <li>• Contract Act</li> <li>• Qanoon-e-Shahadat</li> <li>• Registration Act</li> <li>• Succession Act</li> <li>• Land Acquisition Act</li> <li>• Transfer of Property Act</li> <li>• General Power of Attorney Act</li> <li>• Civil Servant Act, 1973</li> <li>• Civil Servant (APT) Rules, 1973</li> <li>• The Cantonment Act 1924</li> </ul>

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
7.	93/2023	<b>Ordnance Management Officer (Grade-III)</b> (BS-17), Ordnance Corps, GHQ, Ministry of Defence.	Second Class or Grade 'C' Master's degree in Business Administration (Banking/ Finance/ Accounts)/ Commerce/ ICMA or equivalent qualification from a University recognized by the HEC.	Objective Type Test (MCQ)  <b>Part-I</b>  English =20 marks  <b>Part-II</b> Mathematics & Accounting=20 marks  <b>Part-III</b> General Intelligence/ Professional Test=60 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring <b>Part-II</b> • Basic Arithmetic – Ratios – Percentages – Arithmetic Means • Basic Accounting <b>Part-III</b> • Current Affairs. – Issues/Challenges at National and International Level during the last 1 year • Basic Level knowledge of Pakistan Affairs & Islamic Studies • Knowledge of I.T. with reference to Microsoft Excel & preparation of spreadsheets • Inventory Tracking & Auditing • Controlling, verifying & Reporting Stock • Inventory & Supply Chain in a Warehouse. • Warehouse layout • Fire Fighting – Classification of fires – Principles of heat transmission and Fire spread. – Common causes & consequences of fire – Various fire prevention methods • Care and preservation of Arms, Ammunition etc.
8.	95/2023	<b>Seed Certification Officer</b> (BS-17), Federal Seed Certification & Registration Department, Ministry of National Food Security & Research.	Second Class or Grade 'C' Master's degree in Agriculture in one of the subjects of Seed Technology, Plant Breeding, Plant Pathology, Plant Physiology, Agronomy, Plant Protection, Horticulture, Agriculture Extension, Entomology  <b>OR</b> M.Sc. (Botany) with two (2) years post qualification experience in Seed Certification and Seed Testing.	Objective Type Test (MCQ)  <b>Part-I</b>  English = 20 marks  <b>Part-II</b>  Professional Test=60 marks  <b>Part-III</b>  General Intelligence Test=20 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring <b>Part-II</b> • Plant Breeding & Genetics • Plant varietal development • Plant varietal maintenance and propagation • Crop production Technology • Plant taxonomy • Seed Theology & Seed Physiology • Horticulture, Fruit plant production • Stress management in plants • Genetic modification in plants • Common pests and diseases in Pakistan • Best practices in Seed Certification Frameworks around the world

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
					<p><b>Part-III</b></p> <ul style="list-style-type: none"> <li>• General Knowledge</li> <li>• Current Affairs. <ul style="list-style-type: none"> <li>– Developments at National and International Levels in the last 5 year</li> </ul> </li> <li>• Logical Reasoning and Analytical Ability</li> </ul>
9.	96/2023	<b>Assistant Manager (IT)</b> (BS-17), Finance Division.	Second Class or Grade 'C' Master's or Bachelor's (4 years education) degree in Economics/ Econometrics or equivalent qualification from a University recognized by the HEC with a Post Graduate Diploma in Computer Science/ IT.	<p>Objective Type Test (MCQ)</p> <p><b>Part-I</b></p> <p>English = 20 marks</p> <p><b>Part-II</b></p> <p>Professional Test = 80 marks</p>	<p><b>Part-I</b></p> <p>Vocabulary, Grammar Usage, Sentence Structuring.</p> <p><b>Part-II</b></p> <ul style="list-style-type: none"> <li>• Computer Hardware &amp; Software,</li> <li>• Data Communication &amp; Networking,</li> <li>• C/C++ Language,</li> <li>• Visual Basic,</li> <li>• Relational Database Management System (RDBMS),</li> <li>• Operating System Unix/Linux</li> <li>• Oracle/PLSQL,</li> </ul>
10.	97/2023	<b>Demonstrator (Female)</b> (BS-16), Federal Government Educational Institutions (FGEI) Directorate (Cantts/ Garrisons), Colleges, Ministry of Defence.	Second Class or Grade 'C' Master's Degree in Physics/ Chemistry/ Biology.	<p>Objective Type Test (MCQ)</p> <p><b>Part-I</b></p> <p>English = 20 marks</p> <p><b>Part-II</b></p> <p>General Science Test=80 marks</p>	<p><b>Part-I</b></p> <p>Grammar Usage, Sentence Structuring</p> <p><b>Part-II</b></p> <ul style="list-style-type: none"> <li>• <b>Physics:</b> <ul style="list-style-type: none"> <li>– Heat &amp; Thermodynamics,</li> <li>– Electrostatics,</li> <li>– Electromagnetism,</li> <li>– Waves and Optics</li> </ul> </li> <li>• <b>Chemistry:</b> <ul style="list-style-type: none"> <li>– Thermodynamics,</li> <li>– Nature, Properties and States of Matter,</li> <li>– Gases, Liquids &amp; Solids,</li> <li>– Organic Chemistry.</li> </ul> </li> <li>• <b>Biology:</b> <ul style="list-style-type: none"> <li>– Viruses &amp; Algae</li> <li>– Bryophyte</li> <li>– Protozoa</li> <li>– Mollusca</li> </ul> </li> <li>• Maintenance and Management of Science Laboratories.</li> </ul>

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
11.	98/2023	<b>Librarian (Female)</b> (BS-16), Federal Government Educational Institutions, (Cantts/ Garrisons) Directorate, Ministry of Defence.	Second Class or Grade 'C' Bachelor's Degree with Diploma in Library Science. <b>OR</b> Bachelor of Library Science.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Grammar Usage, Sentence Structuring <b>Part-II</b> <ul style="list-style-type: none"> <li>• Information Sources and Services</li> <li>• Cataloguing: Theory and Practice</li> <li>• Procurement and Maintenance of Library Books</li> <li>• Library Automation/Information Storage &amp; Retrieval</li> <li>• Research Methods &amp; Techniques for Librarians</li> <li>• Public Records, Rare Material &amp; their Conservation</li> <li>• Management of Serials Publications</li> <li>• Rules &amp; Procedure regarding Write Off the Library Losses</li> </ul>
12.	99/2023	<b>Demonstrator (Male)</b> (BS-16), Federal Government Educational Institutions (FGEI) Directorate (Cantts/ Garrisons), Colleges, Ministry of Defence.	Second Class or Grade 'C' Master's Degree in Physics/ Chemistry/ Biology.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> General Science Test=80 marks	<b>Part-I</b> Grammar Usage, Sentence Structuring <b>Part-II</b> <ul style="list-style-type: none"> <li>• <b>Physics:</b> <ul style="list-style-type: none"> <li>– Heat &amp; Thermodynamics,</li> <li>– Electrostatics,</li> <li>– Electromagnetism,</li> <li>– Waves and Optics</li> </ul> </li> <li>• <b>Chemistry:</b> <ul style="list-style-type: none"> <li>– Thermodynamics,</li> <li>– Nature, Properties and States of Matter,</li> <li>– Gases, Liquids &amp; Solids,</li> <li>– Organic Chemistry.</li> </ul> </li> <li>• <b>Biology:</b> <ul style="list-style-type: none"> <li>– Viruses &amp; Algae</li> <li>– Bryophyte</li> <li>– Protozoa</li> <li>– Mollusca</li> </ul> </li> <li>• Maintenance and Management of Science Laboratories.</li> </ul>

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
13.	101/2023	<b>Research Officer</b> (BS-17), Food & Agriculture Section, Ministry of Planning, Development and Special Initiatives.	Second Class or Grade 'C' Master's degree or equivalent qualification in Agriculture Economics  <b>OR</b> Bachelor's degree or equivalent qualifications in Agriculture/ Forestry/ Veterinary Science/ Animal Husbandry/ Agricultural Engineering.	Objective Type Test (MCQ)  <b>Part-I</b> English = 20 marks  <b>Part-II</b> Professional Test = 80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>• Concept of Integrated Agriculture</li> <li>• Challenges in Pakistan's Agriculture</li> <li>• Elements of Climate and their Relationship with Crop Growth</li> <li>• Genetic Improvement for Crop Production.</li> <li>• Horticulture</li> <li>• Rainfed and Irrigated Agriculture</li> <li>• Forest, Rangelands and Wildlife Importance and Significance</li> <li>• Range Management and Utilization</li> <li>• Forestry, Agro-forestry, Social Forestry and Forest Biometrics</li> <li>• Socio-economic and Ecological Impact of man-made Forests</li> </ul>

**Schemes and Syllabi for Written Examination (Descriptive) for Posts in  
BS-20 advertised under Consolidated Advertisement No. 05/2023**

Case No.	F.4-85/2023-R
Particulars of post	<b>Registrar Trade Union</b> (BS-20), National Industrial Relations Commission (NIRC), Ministry of Overseas Pakistanis & Human Resource Development.
Minimum Qualification & Experience:	(i) Second Class or Grade 'C' LLB degree or equivalent qualification from a University recognized by HEC. (ii) Seventeen (17) years post qualification experience in BS-17 and above in the field of Labour Administration. <b>OR</b> Five (5) years post qualification experience in BS-19 in case of initial appointment in BS-19 in the field of Labour Administration.

**PAPER: PROFESSIONAL (100 MARKS)**

**Analysis Paper:** Candidates will be required to analyse a situation related to advertised post and suggest/draw suitable solution comprising approximately **1000 words**. Candidate's research based knowledge as well as articulation, expression and technical treatment of the situation will be examined.

**OR**

**Case Study:** Candidates will be given real situation case studies related to advertised posts/ organization concerned and will be expected from the candidates to present (i) identification of issues (ii) evaluation of issues (iii) legal or case related theories (iv) evaluation of case facts if required and (v) possible solution of the case or writing judicial order, if the case so requires.



## Schemes and Syllabi for Written Examination (Descriptive) for All Posts in BS-18 & BS-19 included in Consolidated Advertisement No. 05/2023

### PAPER-I: ENGLISH

Max Marks: 100

Time Allowed: 3 Hours

- (i) **English Essay-50 Marks:** Candidates will be required to write an Essay in English comprising **1500 words** from a set of **six given topics**. Candidates are expected to reflect comprehensive and research based knowledge on a selected topic. Candidate's articulation, expression and technical approach to the style of English Essay writing will be examined.
- (ii) **English (Composition and Précis)-50 Marks:**  
The examination will test the candidate's abilities to handle Précis Writing, Reading Comprehension, Sentence Structuring, Translation, Grammar and Vocabulary, etc.
- Précis Writing (10 marks):** A selected passage with an orientation of generic understanding and enough flexibility for compression shall be given for précising and suggesting an appropriate title.
- Reading Comprehension (10 marks):** A selected passage that is rich in substance but not very technical or discipline-specific shall be given, followed by five questions, each carrying 2 marks.
- Grammar and Vocabulary (10 marks):** Correct usage of Tense, Articles, Prepositions, Conjunctions, Punctuation, Phrasal Verbs, Synonyms and Antonyms etc.
- Sentence Correction (5 marks):** Ten sentences shall be given each having a clear structural flaw in terms of grammar or punctuation. The candidates shall be asked to rewrite them with really needed correction only, without marking unnecessary alterations. No two or more sentences should have exactly the same problem, and 2-3 sentences shall be based on correction of punctuation marks.
- Grouping of Words (5 marks):** A random list of ten words of moderate standard (neither very easy nor utterly unfamiliar) shall be given, to be grouped by the candidates in pairs of those having similar or opposite meaning, as may be clearly directed in the question.
- Pairs of Words (5 marks):** Five pairs shall be given of seemingly similar words with different meanings, generally confused in communication, for bringing out the difference in meaning of any five of them by first explaining them in parenthesis and then using them in sentences.
- Translation (5 marks):** Ten short Urdu sentences involving structural composition, significant terms and figurative/idiomatic expressions shall be given, to be accurately translated in English.

### SUGGESTED READINGS

Sr. No.	Title	Author
1.	English Grammar in Use	Raymond Murphy
2.	Practical English Usage	M. Swan
3.	Practical English Grammar and Composition	S.C. Gupta
4.	Improve your Punctuation & Grammar	Marion Field
5.	The Little, Brown Handbook	H. Ramsey Flower & Jane Aaron
6.	A University English Grammar	R. Quirk & S. Greenbaum
7.	Write Better, Speak Better	Readers Digest Association
8.	Modern English in Action	Henry Christ
9.	Exploring the World of English	Syed Saadat Ali Shah

**PAPER-II: PROFESSIONAL****Max Marks: 100****Time Allowed: 3 Hours**

Case No.	F.4-81/2023-R
Particulars of post	<b>General Staff Officer, Grade-I (Classified Radiologist) (BS-19),</b> Interventional Radiology Department, Armed Forces Institute of Radiology and Imaging, Ministry of Defence.
Minimum Qualification & Experience:	(i) MBBS or equivalent qualification from a University recognized by PM&DC. (ii) FCPS (Radiology) or equivalent qualification recognized/ registered by the PM&DC. (iii) One (1) year Fellowship degree/ OJT in Interventional Radiology. (iv) Seven (7) years post qualification working experience at any renowned medical imaging setup.

**Part-I: 25 Marks (MCQ)**

25 MCQ Questions on Part-II &amp; Part-III.

**Part-II: (Qualification Based) (Descriptive) 25 Marks**Core courses of **MBBS Degree****Part-III: (Professional) (Descriptive) 50 Marks**

- i. Core courses of FCPS in **Radiology**.
- ii. Core Courses of Specialization in **Interventional Radiology**.

**Note: (Equal weightage for each topic at Part-III)**

**PAPER-II: PROFESSIONAL****Max Marks: 100****Time Allowed: 3 Hours**

Case No.	F.4-84/2023-R
Particulars of post	<b>Deputy Director (Urdu Stenography)</b> (BS-18), Secretariat Training Institute, Islamabad, Establishment Division.
Minimum Qualification & Experience:	(i) Second Class or Grade 'C' Bachelor's degree with Urdu as one of the subject from University recognized by HEC. (ii) Minimum shorthand speed: 100 w.p.m. and typing speed: 40 w.p.m. with 90% accuracy. (iii) Certificate in Urdu Stenography from a recognized Institution. (iv) Ten (10) years post qualification functional/ instructional experience of Urdu Stenography. <b>Note:</b> Typing test would be held on Computers through relevant Urdu Software

**Professional Test: 100 Marks**

S. No.	Detail of Topics	Marks
1.	Urdu Typing Test on Inpage with minimum speed of 40 w.p.m with 90% Accuracy	<b>35</b>
2.	Urdu Shorthand Test with minimum speed of 100 w.p.m	<b>35</b>
3.	Computer Literacy Test: (30 Marks)	
	i. In-page (Typing, Formatting)	<b>10</b>
	ii. Microsoft Excel (Typing, Calculation and Graphic)	<b>10</b>
	iii. Microsoft Power Point (Typing, Formatting, Inserting Objects)	<b>10</b>

**PAPER-II: PROFESSIONAL****Max Marks: 100****Time Allowed: 3 Hours**

Case No.	F.4-86/2023-R
Particulars of post	<b>Director (System)</b> (BS-19), Policy Wing, Petroleum Division, Ministry of Energy.
Minimum Qualification & Experience:	(i) Bachelor's degree in Chemical/Refining Engineering. (ii) Twelve (12) years post qualification experience in Oil Refineries or Petroleum related field in posts in BS-17 and above.

**Part-I: 25 Marks (MCQ)**

- 25 MCQ Questions on Part-II.

**Part-II (Professional): 75 Marks (Subjective)****I. Petroleum Refinery Engineering**

Introduction; origin; formation and composition of petroleum; Indigenous and world resources. Refinery products; properties; significant tests and standard test methods; characterization and evaluation of crude oil stocks; generation of crude processing data; Crude preheating and preliminary treatment; pipe still heaters; desalting; atmospheric and vacuum distillation; steam stripping; arrangement of towers. Calculation of number of trays, types of reflux employed; Packie's approach; processing plans, schemes and product patterns of refineries. Modern separation, conversion and treatment processes. Thermal and catalytic cracking and reforming, hydrocracking. Auxiliary processes and operations; refinery corrosion and metals; blending plants, product design and marketing. Use of linear programming techniques to solve refinery blending and production problems; Overview of petroleum act.

**II. Fuels & Energy**

Survey of available energy resources. Introduction and survey of locally available fuels, industrial fuels: Classification and storage of solids, liquids and gaseous fuels: Criteria and characterization for the selection of fuels for industrial purposes; Carbonization, liquefaction and gasification of coal; Synthetic fuels; Petroleum refining, natural gas processing & syngas production. Fuel up gradation, Fisher trop process and clean coal technology

Furnaces, Burners and their performance Biomass Sources, Pre-treatment of biomass for thermo-chemical conversion, methods of production of fuels from biomass, Gasification and liquefaction of forest products, Biomass volatilization, Kinetics of gasification, Ethanol and Methanol production from biomass.

**III. Chemical Engineering Economics**

Engineering economy basics: Measures of financial effectiveness; Non-monetary factors and multiple objectives; principles of engineering economy. Consumer and producer goods; Measures of economic worth; Price, Supply and Demand relationship; Production; Factors of production; Laws of return, Taxation & Insurance.

Depreciation calculation Sunk and opportunity costs; Fixed, variable and incremental costs; Recurring and nonrecurring costs; Direct, indirect and overhead costs; Standard costs; Break even analysis; Unit cost of production; Cost-benefit analysis; Feasibility studies; Value analysis in designing and purchasing. Economic evaluation of processes and equipment; Payback period method; Present worth method; Uniform annual cost

method; Rate of return method (including Internal Rate of Return). Manufacturing lead time; Production rate; Capacity; Utilization; Availability; Work in process; WIP and TIP ratios.

Types of ownership; types of stock; Partnership & joint stock companies; Banking and specialized credit institutions. Islamic and Contemporary financing systems and their use in cost estimation.

#### IV. Mineral Processing

Introduction to Mineralogy; Objectives of mineral processing. Properties of minerals and ores. Sampling and evaluation. Comminution: fracture, liberation, size criteria, energy-size relationships. Crushing and grinding. Screening and classifying. Concentration processes: density and other physical processes. Interfacial phenomena. Flotation. Liquid-solid separation: flocculation, thickening, filtration. Wash ability curves. Partition curves. Material balances. Performance prediction. Applications of biotechnology in mineral processing.

#### SUGGESTED READINGS

S. No.	Title	Author
1.	Petroleum Refinery Engineering	W.L. Nelson,
2.	Refining Processes Handbook,	S. Parkash,
3.	An Introduction to Combustion	Turns, S.R.
4.	Flame and Combustion	Griffiths, J.F. & Barnard, J.A.
5.	Engineering Economy	Leland Blank, and Anthony Tarquin
6.	Essentials of Engineering Economics	James L. Riggs, and Thomas M. West
7.	Engineering Economy	William G. Sullivan & C. Patrick koelling
8.	Applied Mineralogy: A Quantitative Approach	Jones, Meurig P.,
9.	Introduction to Mineral Processing	Kelly, Errol G. And Spottiswood, David J.

**PAPER-II: PROFESSIONAL**Max Marks: 100Time Allowed: 3 Hours

Case No.	F.4-88/2023-R
Particulars of post	<b>Deputy Chief (BS-19)</b> , NTRC, Ministry of Communications.
Minimum Qualification & Experience:	(i) Second Class or Grade 'C' Bachelor's degree in Transportation Engineering or Geo-Technical and Highway Engineering or equivalent qualification from a University recognized by the HEC with valid registration by PEC. <b>OR</b> Second Class or Grade 'C' Master's degree in Transport Management or equivalent qualification from a University recognized by the HEC. (ii) Twelve (12) years post qualification experience in strategic policy making or management or planning or operations or research in a Government Department or International Organization or Academia relating to Transport Sector.

**Part-I: 25 Marks (MCQ)**

- 25 MCQ Questions on Part-II.

**Part-II (Professional) (Subjective) : 75 Marks****I. Introduction to Transportation Systems and Planning**

- Modes of transportation, need and scope of comprehensive plan
- Phases of planning
- Principles of planning
- Communication (road network, rail-road network & airport), port and harbor facilities
- Introduction to design aspects
- Overview of Mass Transit Systems

**II. Introduction to Road Systems**

- Location Survey in Rural and Urban Areas
- Urban Location Controls
- Highway Planning
- Roads in Hilly Areas

**III. Highway Engineering**

- Highway Components
- Elements of a typical cross-section of road
- Classification of Highways
- Highway Materials

**IV. Geometric Design**

- Design controls and criteria
- Sight distance requirements
- Horizontal curves
- Super elevation

**V. Pavement Design**

- Types of pavements
- Wheel loads
- Equivalent single axle load
- Repetition and impact factors
- Load distribution characteristics
- Design of flexible and rigid pavements

- Highway drainage
- Pavement failures

#### VI. Traffic Engineering

- Operating and design speeds
- Traffic flow parameters, their relationships and data collection methodologies
- Traffic Survey, O & D Survey
- At-grade and grade-separated intersections
- Traffic management, Level of service and signal timing for an intersection

#### SUGGESTED READINGS

S.No.	Title	Author
1.	Transportation Engineering Introduction to Planning, Design and Operations	Jason C. Yu,
2.	The Design and Performance of Road Pavements	Croney D.,
3.	Highway Traffic Analysis and Design	Salter R. J.
4.	Principles of Highway Engineering and Traffic Analysis	Fred L. Mannering, Scott S. Washburn, Walter P. Kilareski

**PAPER-II: PROFESSIONAL****Max Marks: 100****Time Allowed: 3 Hours**

Case No.	F.4-91/2023-R
Particulars of post	<b>Assistant Chief</b> (BS-18), Education Section, Ministry of Planning, Development and Special Initiatives.
Minimum Qualification & Experience:	(i) Second Class or Grade 'C' Master's degree or equivalent qualification in Education or Second Class or Grade 'C' Master's Degree or equivalent qualifications in any discipline with Bachelor's Degree or equivalent qualifications in Education. (ii) Three (3) years post qualification experience of work and/ or research relating to education or in planning or development of education.

**Part-I: 25 Marks (MCQ)**

- 25 MCQ Questions on Part-II & III.

**Part-II: (Research and Planning) (Descriptive)****25 Marks****i. Communication Skills, Technical Writing and Presentation Skills**

Paragraph writing, Essay writing, CV and job application, Translation skills, Study skills, Academic skills, Essay writing, Academic writing, Technical Report writing, Progress report writing, Presentation skills

**ii. Planning and Management**a) Project Management

Project Management, Processes Integration Management, Project Plan Development, Project Plan Execution and Overall Change Control, PERT, Gantt Chart, CPM

b) Scope Management

Initiation, Scope Planning, Scope Definition, Scope Verification and Scope Change Control.

c) Communications Management

Communications Planning, Information Distribution, Performance Reporting and Administrative Closure.

d) Risk Management

Risk Identification, Risk Quantification, Risk Response Development and Risk Response Control.

e) Statistical Techniques

All statistical techniques related to Planning & Research

**Part-III: (Education) (Descriptive)****50 Marks****I. Development of Curriculum and Instructional Material**

- Elements of Curriculum.
- Curriculum Development Process: Need Assessment, Formulation of Aims and Objectives, Taxonomies of Educational Objectives, Selection of Content, Development of Curricular Materials.

**II. Process of Teaching and Teaching Strategies**

- Process of Classroom Communication
- Factors affecting Classroom Communication
- Barriers to Classroom Communications
- Use of Instructional Materials and Media



**III. Educational Assessment and Evaluation**

- Concept of Classroom Assessment and Evaluation
- Distinction between Assessment, Evaluation and Measurement
- Approaches to Evaluation: Formative Evaluation; Summative Evaluation
- Types of Test: Essay Type; Objective Type: Multiple Choice, True-False Items, Matching Type; Principles of Construction of these Test
- Characteristics of a Good Test: Validity, Reliability, Objectivity, Usability

**IV. Educational Administration and Supervision**

- The Concept of Administration
- Educational Supervision

**V. Research Methods in Education**

- Scientific Method and its Application in Education
- Sampling Techniques:
- Research Instruments: Questionnaire: Interview; Test; Observation; Rating Scale
- Research Proposal and Report Writing

**SUGGESTED READINGS**

<b>S. No.</b>	<b>Title</b>	<b>Author</b>
1.	Practical English Grammar	A.J. Thomson and A.V. Martinet.
2.	Writing. Intermediate	Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet.
3.	Writing. Upper-Intermediate	Rob Nolasco.
4.	Reading. Advanced	Brian Tomlinson and Rod Ellis.
5.	Study Skills	Riachard Yorky
6.	Writing. Advanced	Ron White.
7.	College Writing Skills	John Langan.
8.	Patterns of College Writing	Laurie G. Kirszner and Stephen R. Mandell.
9.	The Mercury Reader. A Custom Publication.	Janice Neulib; Kathleen Shine Cain; Stephen Ruffus and Maurice Scharon.
10.	Project Management Body of Knowledge,	Project Management Institute (PMI) standards committee
11.	Software Project Management	S.A. Kelkar, A Concise Study, Prentice Hall of India.
12.	Research in Education	JW Best
13.	Integrating Education Technology into Teaching	Roblyer
14.	Curriculum Development	S. M. Shahid
15.	Educational Measurement and Evaluation	S. M. Shahid
16.	Educational Administration	S. M. Shahid

**PAPER-II: PROFESSIONAL****Max Marks: 100****Time Allowed: 3 Hours**

Case No.	F.4-94/2023-R
Particulars of post	<b>Director (Computer Data Management)</b> (BS-19), Policy Wing, Petroleum Division, Ministry of Energy.
Minimum Qualification & Experience:	(i) Second Class or Grade 'C' Master's degree or equivalent in Computer Science/ Mathematics/ Statistics/ Physics/ Economics. <b>OR</b> Bachelor degree in Engineering. (ii) Training in Systems Analysis/ Operation Research. Relaxable for holders of Master's degree in Computer Science. (iii) Twelve (12) years post qualification experience of Programming/ System Analysis / Operations Research including three (3) years experience of supervising the Systems and Programming staff at a major computer installations.

**Part-I: 25 Marks (MCQ)**

- 25 MCQ Questions on Part-II.

**Part-II: (Computer Science) (Descriptive)****75 Marks****I. Introduction to Computing**

Introduction to Information Technology and Computers, History of Computing, Computer HW and SW Details, Computer System Components and Communication System, Input & Output devices and their types, Storage Media and their types, Types of Computer Hardware, Information Security/Privacy, Computer Crimes and Ethical Challenges, Trees (Binary Trees, Binary Search trees, AVL Trees, Encryption Algorithms (DES, RSA), Design Concepts, Architectural Design, Design & Implementation, Project Management, Machine Instruction Characteristics, Instruction Processing, Processor Structure & Function, Control Unit Operation, Micro-programmed Control, Instruction-Level Parallelism And Superscalar Processors, Parallel Processing, Multi-Processor and Multi-core Systems.

**II. Computer Communications & Networks**

Basic Concepts and Classification of Networks, Circuit switching, Packet switching, Multiplexing (TDM, FDM), Layering: OSI and TCP/IP, Application Layer (Network application architectures, HTTP, FTP, Email, DNS, P2P applications), Transport Layer (Multiplexing in UDP and TCP, Connectionless Transport: UDP, Reliable data transfer and TCP, Congestion avoidance and control), Network Layer (The Internet Protocol, IPv4 Datagram, Internet Address Classes, Special IP Addresses ARP, IPv6, ICMP, Network Address Translation (NAT), Internet Routing Protocols and Algorithms, X.25, Frame relay and ATM, MPLS), Physical & Link Layer Functionalities (Error Detection & Control, ARQ, Link layer addressing, LAN Technologies, Bridges and Hubs, Multiple Access), Special topics (Security, Overlay networks, naming, Content distribution networks, Peer to peer systems, DHTs, Network Attacks).

**III. Database Systems**

Introduction to Database Systems, Relational Data Model & Relational Database Constraints, Relational Data Model, SQL, Relational Algebra & Calculus, ER Model, ER to Relational Mapping, PL/SQL Stored Procedures & Triggers, Functional Dependencies and

Normalization, Storage & Indexing, Indexing Structure, XML documents & Web Services, Query Processing & Evaluation, Query Optimization, Transaction processing, Object-Oriented Databases, Distributed Databases, Database Security & Access Control

#### IV. Operating Systems & Web

Roles of an Operating System, Operating-System Evolution, Memory Management, File Systems (UNIX and Windows Systems), Web applications Issues (Accessibility, testing, performance, operation, maintenance, security).

#### SUGGESTED READINGS

S. No.	Title	Author
1.	Computer System Architecture	M. Morris Mano
2.	Software Engineering	Ian Sommerville
3.	Computer Networking: A Top Down approach featuring the Internet	James F. Kurose and Keith W. Ross
4.	Data and Computer Communications	William Stallings
5.	Database Systems Concepts	Silberchatz, Abraham & Korth, Sudarshan
6.	Computer Networks	Andrew Tanenbaum
7.	Web Services: Principles and Technology	Michael Papazoglu

**PAPER-II: PROFESSIONAL****Max Marks: 100****Time Allowed: 3 Hours**

Case No.	F.4-100/2023-R
Particulars of post	<b>Assistant Solicitor</b> (BS-18), Ministry of Law & Justice.
Minimum Qualification & Experience:	(i) Bachelor's degree in Law or equivalent. (ii) Five (5) years post qualification experience of work in Judicial or Legal appointment or practice as an Advocate in a court of law.

**Part-I: 25 Marks (MCQ)**

- 25 MCQ Questions on Part-II.

**Part-II (Professional) (Subjective) : 75 Marks**

- Philosophy of Laws
- Constitutional Law
- Laws of Contract
- Concept of arbitration, arbitration with or without intervention of court and in civil suits.
- The Code of Civil Procedure, 1908
- Pakistan Panel Code, 1860
- Qanun-e-Shahdat Order, 1984
- Criminal Procedure Code, 1898
- Important principles established in decisions of Superior Courts

**SUGGESTED READINGS**

S. No.	Title	Author
1.	Pakistan Panel Code, 1860	M. Mahmood
2.	Criminal Procedure Code, 1898	Shaukat Mahmood
3.	Law of Evidence	Justice (R) Khalid ur Rahman Khan as adapted from Principles and Digest of the Law of Evidence by M. Monir
4.	Qanun-e-Shahdat Order, 1984	
5.	The Code of Civil Procedure, 1908	Aamir Raza A. Khan
6.	The Arbitration Laws in Pakistan	M. Mahmood
7.	Civil Courts Ordinance, 1962	Nisar Ahmad Nisar