

**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. 06/2022**

| S. No | Case No. F.4- | Particulars of Post(s)  | Qualifications/Experience for the Posts  | Test Specification   | Topics of Syllabi   |
|-------|---------------|---|--|--|---|
| 1.    | 88/2022       | <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 OR Bachelor's degree or equivalent qualifications in Agriculture/ Forestry/ Veterinary Science/ Animal Husbandry/ Agricultural Engineering.   | Objective Type Test (MCQ)<br><b>Part-I</b><br>English = 20 marks<br><b>Part-II</b><br>Professional Test = 80 marks | <b>Part-I</b><br>Vocabulary, Grammar Usage, Sentence Structuring.<br><b>Part-II</b><br><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> |
| 2.    | 89/2022       | <b>Data Processing Officer</b> (BS-16), Jawaid Azfar Computer Centre, Ministry of Planning Development and Special Initiatives. | Second Class or Grade 'C' Master's degree in Computer Science/ Statistics/ Mathematics/ Economics. OR (i) Second Class or Grade 'C' Bachelor's degree in Computer Science. (ii) One (1) year post qualification experience in the field of Data Processing. OR (i) Second Class or Grade 'C' Bachelor's degree in Statistics/ Mathematics/ Economics. (ii) Three (3) years post qualification experience in the field of Data Processing | Objective Type Test (MCQ)<br><b>Part-I</b><br>English =20 marks<br><b>Part-II</b><br>Professional Test=80 marks    | <b>Part-I</b><br>Grammar Usage, Sentence Structuring<br><b>Part-II</b><br><ul style="list-style-type: none"> <li>• Operating Systems</li> <li>• Algorithm Design</li> <li>• Database Management System (DBMS)</li> <li>• Hardware &amp; Software</li> <li>• Implementation &amp; Security of LAN &amp; WAN</li> <li>• Software Development Techniques</li> </ul>  |

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|-------|---------------|--|---|--|--|
| 3.    | 90/2022       | <b>Electronic Engineer</b> (BS-17), Pakistan Meteorological Department Cabinet Secretariat, Aviation Division. | B.E/ B.Sc Engineering in Mechanical/ Electrical/ Electronics/ Instruments from a University recognized by HEC.  | Objective Type Test (MCQ)<br><br><b>Part-I</b><br>English = 20 marks<br><br><b>Part-II</b><br>Professional Test=80 marks | <b>Part-I</b><br>Vocabulary, Grammar Usage, Sentence Structuring<br><b>Part-II</b><br><ul style="list-style-type: none"> <li>• Power &amp; Digital Electronics.</li> <li>• Electronic Instrumentations.</li> <li>• Logic Design &amp; Switching Theory.</li> <li>• Circuit Theory, Electric Current and Ohm's law</li> <li>• Electrostatics</li> <li>• Magnetic Circuits</li> <li>• Electrical Engineering Materials</li> <li>• Instruments and Measurements</li> <li>• Mechanical behaviour of materials</li> <li>• Heat transfer, Conduction &amp; Convection</li> <li>• DC Generators.</li> <li>• Transformers.</li> <li>• Transmission and Distribution Cables.</li> <li>• High Voltage Engineering</li> <li>• Rectifiers and Convertors.</li> </ul> |
| 4.    | 94/2022       | <b>Research Associate/ Officer</b> (BS-17), Ministry of Federal Education and Professional Training.           | (i) Second Class or Grade 'C' Master's degree in Finance/ Business Administration/ Public Administration/ Economics or equivalent qualification from a University recognized by the HEC.<br>(ii) Two (2) years post qualification experience of research related activities in PSDP projects. | Objective Type Test (MCQ)<br><br><b>Part-I</b><br>English = 20 marks<br><br><b>Part-II</b><br>Professional Test=80 marks | <b>Part-I</b><br>Vocabulary, Grammar Usage, Sentence Structuring.<br><b>Part-II</b><br><ul style="list-style-type: none"> <li>• PSDP Cycle</li> <li>• Project Management and Evaluation tools</li> <li>• Methods of Data Analysis,</li> <li>• Research Methods in Education,</li> <li>• Significance of Budgeting,</li> <li>• Role of Human Resource Management in Organization Performance</li> <li>• Major issues in Pakistan Economy</li> </ul>   |
| 5.    | 98/2022       | <b>Data Processing Assistant</b> (BS-16), Federal Government Organization.                                     | (i) Second Class or Grade 'C' Bachelor's degree or equivalent in Computer Science.<br>(ii) Three (3) years post qualification experience in Computer Operation/ Data Processing/ Networking.  | Objective Type Test (MCQ)<br><br><b>Part-I</b><br>English =20 marks<br><br><b>Part-II</b><br>Professional Test=80 marks  | <b>Part-I</b><br>Grammar Usage, Sentence Structuring<br><b>Part-II</b><br><ul style="list-style-type: none"> <li>• Operating Systems</li> <li>• Algorithm Design</li> <li>• Database Management System (DBMS)</li> <li>• Hardware &amp; Software</li> <li>• Implementation &amp; Security of LAN &amp; WAN</li> <li>• Software Development Techniques</li> </ul> <b>Note:</b> For Pre-selected candidate, syllabus for Descriptive Test is at Page-4 below   |

| S. No | Case No. F.4- | Particulars of Post(s)  | Qualifications/Experience for the Posts  | Test Specification   | Topics of Syllabi  |
|-------|---------------|---|--|--|--|
| 6.    | 100/2022      | <b>Research Officer</b> (BS-17), National Transport Research Centre (NTRC), Ministry of Communications. | 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. OR Second Class or Grade 'C' Master's degree in Transport Management or equivalent qualification from a University recognized by the HEC. | Objective Type Test (MCQ)<br><b>Part-I</b><br>English = 20 marks<br><b>Part-II</b><br>Professional Test=80 marks | <b>Part-I</b><br>Vocabulary, Grammar Usage, Sentence Structuring.<br><b>Part-II</b><br><ul style="list-style-type: none"> <li>• Highway administration,</li> <li>• Traffic appraisal,</li> <li>• Environmental appraisal,</li> <li>• Highway: geometry, drainage, lighting and signing,</li> <li>• Communications and safety,</li> <li>• Roads and traffic in urban areas,</li> <li>• Highway maintenance,</li> <li>• Low cost roads in developing countries.</li> </ul> |

## SUBJECTIVE TYPE IT PROFICIENCY TEST

Max Marks: 100

Qualifying Standard 50%

Time Allowed: 3 Hours

|                                     |  |
|-------------------------------------|--|
| Case No.                            | F.4-98/2022-R  |
| Particulars of post                 | <b>Data Processing Assistant</b> (BS-16), Federal Government Organization.   |
| Minimum Qualification & Experience: | i. Second Class or Grade 'C' Bachelor's degree or equivalent in Computer Science.<br>ii. Three (3) years post qualification experience in Computer Operation/ Data Processing/ Networking. |

### 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**

| <b>S. No.</b> | <b>Title</b>  | <b>Author</b>                           |
|---------------|---|---|
| 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                       |

**Schemes and Syllabi for Written Examination (Descriptive) for all Posts in BS-20 & 21 advertised under Consolidated Advertisement No. 06/2022**

|                                     |   |
|-------------------------------------|---|
| Case No.                            | <b>F.4-87/2022-R</b>  |
| Particulars of post                 | <b>Director (MIS)</b> (BS-20), Federal Board of Revenue (Revenue Division).   |
| Minimum Qualification & Experience: | <p>i. Second Class or Grade 'C' Master's degree in Computer Science/ Information Technology or equivalent from a University recognized by HEC.</p> <p align="center"><b>OR</b></p> <p>Second Class or Grade 'C' Bachelor's degree in Computer Science/ BIT (4 years duration) or equivalent from a University recognized by HEC.</p> <p>ii. Seventeen (17) years post qualification experience of Programming/ Systems Designing/ Operations Research supported by Technical Publications including ten (10) years post qualification experience of Supervising System and Programming at a Major Computer Installations.</p> |

**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. 06/2022

### 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 (Cambridge University Press)                            |
| 2.      | Practical English Usage        | M. Swan (Oxford University Press)                                      |
| 3.      | The Little, Brown Handbook     | H. Ramsey Flower & Jane Aaron (The Little, Brown & Co; Harper Collins) |
| 4.      | A University English Grammar   | R. Quirk & S. Greenbaum (ELBS; Longmans)                               |
| 5.      | Write Better, Speak Better     | Readers Digest Association   |
| 6.      | Modern English in Action       | Henry Christ (D.C. Heath & Co.)  |
| 7.      | Exploring the World of English | Syed Saadat Ali Shah   |

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

|                                     |  |
|-------------------------------------|--|
| Case No.                            | F.4-91/2022-R  |
| Particulars of post                 | <b>Deputy Director/ Senior Meteorologist</b> (BS-18), Pakistan Meteorological Department, Cabinet Secretariat (Aviation Division).   |
| Minimum Qualification & Experience: | <p>Ph.D. in Meteorology/ Seismology/ Hydro-Meteorology/ Hydrology/ Geophysics/ Geology/ Geography/ Physical Chemistry/ Physics/ Mathematics/ Environment/ Space Science/ Agriculture Meteorology/ Computer Science or equivalent in the field of Meteorology from a University recognized by HEC with one (1) year post qualification experience in BS-17.</p> <p style="text-align: center;"><b>OR</b></p> <p>M. Phil. in one the above subjects from a University recognized by HEC with three (3) years post qualification experience in BS-17 in the field of Meteorology.</p> <p style="text-align: center;"><b>OR</b></p> <p>i. Second Class or Grade 'C' Master's degree in one of the above subjects from a University recognized by HEC with five (5) years post qualification experience in BPS-17 in the field of Meteorology.</p> <p>ii. Graduation with Physics or Mathematics from a University recognized by HEC.</p> |

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

- 25 MCQ Questions on Part-II.

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

The Composition and Structure of Earth's Atmosphere, Hydrostatic Equation and its Applications, The Clausius-Clapeyron Equation, The Poisson's Equation, Adiabatic Processes, Parcel Concepts, Stability in the Atmosphere, Moisture in the Atmosphere, The Tephigram, Skew-T Log-P Diagram, Solar and Terrestrial Radiation, The Greenhouse Effect, Energy Balance at the Earth's Surface, Net Radiation, Free and Forced Convection, Temperature Inversions.

Cloud Formation, Cloud Classification, Precipitation Processes, Forms of Precipitation, Thunderstorms, Tornadoes, Hurricanes, Tropical Cyclones, Cyclones and Anti-Cyclones, Pressure Gradient Force, Coriolis Force, Friction, Geostrophic Wind, Gradient Wind, Thermal Wind, Land-Sea and Mountain- Valley Breezes, Chinook and Katabatic Winds, Jet Streams, Air Masses, Weather Fronts, Meteorological Satellites, Interpretation of Weather Satellite Imagery, Automatic Weather Stations, Weather Maps, Weather Symbols, Weather Forecasting,

The Earth's Atmosphere, Stratospheric Ozone Depletion, Energy and Radiation, Sun Angle and Seasons, Solar Radiation in the Atmosphere, Radiation Balances, Energy and Temperature, Daily Temperature Variations, Global Temperature Controls, Atmospheric Optics, Atmospheric Humidity, Cooling Processes, Condensation, Lifting Mechanisms, Static Stability, Inversions, Cloud Droplets Atmospheric Pressure, Horizontal Flow Aloft, Rotating Motion, Surface Flows, Tropical Hadley Circulation, General Circulation, Thermal Winds, Thermally Direct Circulations, Down slope Winds, Polar Front Theory, Surface and Upper Air Weather Charts, Radar Meteorology,



Winter and Summer Rain Process, Monsoon, Floods and Drought, Meteorological Instruments (Thermometer, Barometer, Anemometer, Wing Vane, Radiometer, Sunshine Recorder etc.), Fog Formation, Impact of Fog on Crop Production.

### SUGGESTED READINGS

| <b>Sr. No.</b> | <b>Title</b>  | <b>Author</b>            |
|----------------|---|--------------------------|
| 1.             | An Introduction to Atmospheric Physics                            | Andrews D G              |
| 2.             | An Introduction to Atmospheric Thermodynamics                     | Tsonis A A               |
| 3.             | Meteorology Today   | Donald A C               |
| 4.             | Essentials of Meteorology   | Macintosh D H & Thom S A |
| 5.             | Atmosphere weather and climate                                    | Barry R                  |
| 6.             | Climate change causes effects and solutions by Atmospheric change | John T H                 |
| 7.             | Monsoon   | Bin Wang                 |

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

|                                     |   |
|-------------------------------------|---|
| Case No.                            | F.4-92/2022-R   |
| Particulars of post                 | <b>Director/ Principal Meteorologist</b> (BS-19), Pakistan Meteorological Department, Cabinet Secretariat (Aviation Division).  |
| Minimum Qualification & Experience: | <p>Ph.D. in Meteorology/ Seismology/ Hydro-Meteorology/ Hydrology/ Geophysics/ Geology/ Geography/ Physical Chemistry/ Physics/ Mathematics/ Environment/ Space Science/ Agriculture Meteorology/ Computer Science or equivalent in the field of Meteorology from a University recognized by HEC with eight (8) year post qualification experience in BS-17 and above.</p> <p style="text-align: center;"><b>OR</b></p> <p>M. Phil. in one the above subjects from a University recognized by HEC with ten (10) years post qualification experience in BS-17 or above in the field of Meteorology.</p> <p style="text-align: center;"><b>OR</b></p> <p>i. Second Class or Grade 'C' Master's degree in one of the above subjects or equivalent in the field of Meteorology from a University recognized by HEC with twelve (12) years post qualification experience in BPS-17 and above.</p> <p>ii. Graduation with Physics or Mathematics from a University recognized by HEC.</p> |

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

- 25 MCQ Questions on Part-II.

**Part-II: (Meteorology) 75 Marks (Descriptive)**

The Composition and Structure of Earth's Atmosphere, Hydrostatic Equation and its Applications, The Clausius-Clapeyron Equation, The Poisson's Equation, Adiabatic Processes, Parcel Concepts, Stability in the Atmosphere, Moisture in the Atmosphere, Skew-T Log-P Diagram, Solar and Terrestrial Radiation, The Greenhouse Effect, Energy Balance at the Earth's Surface, Net Radiation, Free and Forced Convection, Temperature Inversions.

Cloud Formation, Cloud Classification, Precipitation Processes, Forms of Precipitation, Thunderstorms, Tornadoes, Hurricanes, Tropical Cyclones, Cyclones and Anti-Cyclones, Pressure Gradient Force, Coriolis Force, Friction, Geostrophic Wind, Gradient Wind, Thermal Wind, Land-Sea and Mountain- Valley Breezes, Chinook and Katabatic Winds, Jet Streams, Air Masses, Weather Fronts, Meteorological Satellites, Interpretation of Weather Satellite Imagery, Automatic Weather Stations, Weather Maps, Weather Symbols, Weather Forecasting.

The Earth's Atmosphere, Stratospheric Ozone Depletion, Energy and Radiation, Sun Angle and Seasons, Solar Radiation in the Atmosphere, Radiation Balances, Energy and Temperature, Daily Temperature Variations, Global Temperature Controls, Atmospheric Optics, Atmospheric Humidity, Cooling Processes, Condensation, Lifting Mechanisms, Static Stability, Inversions, Cloud Droplets Atmospheric Pressure, Horizontal Flow Aloft, Rotating Motion, Surface Flows, Tropical Hadley Circulation, General Circulation, Thermal Winds, Thermally Direct Circulations, Down slope Winds, Polar Front Theory, Surface and Upper Air Weather Charts, Radar Meteorology, Biodiversity and Climate Change.

Winter and Summer Rain Process, Monsoon, Floods and Drought, Meteorological Instruments (Thermometer, Barometer, Anemometer, Wing Vane, Radiometer, Sunshine Recorder etc.), Fog Formation, Impact of Fog on Crop Production.

### SUGGESTED READINGS

| <b>Sr. No.</b> | <b>Title</b>  | <b>Author</b>            |
|----------------|---|--------------------------|
| 1.             | An Introduction to Atmospheric Physics                            | Andrews D G              |
| 2.             | An Introduction to Atmospheric Thermodynamics                     | Tsonis A A               |
| 3.             | Meteorology Today   | Donald A C               |
| 4.             | Essentials of Meteorology   | Macintosh D H & Thom S A |
| 5.             | Atmosphere weather and climate                                    | Barry R                  |
| 6.             | Climate change causes effects and solutions by Atmospheric change | John T H                 |
| 7.             | Monsoon   | Bin Wang                 |

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

|                                     |  |
|-------------------------------------|--|
| Case No.                            | F.4-93/2022-R  |
| Particulars of post                 | <b>Deputy Director</b> (BS-18), Jawaid Azfar Computer Centre, Ministry of Planning, Development and Special Initiatives.   |
| Minimum Qualification & Experience: | i. Second Class or Grade 'C' Master's degree in Public Administration/ Business Administration or equivalent qualification from a University recognized by HEC.<br>ii. Five (5) years post qualification experience in BS-17 or equivalent in the field of Administration. |

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

- 25 MCQ Questions on Part-II & III

**Part-II: 50 Marks (Descriptive)**

(Related to required qualifications &amp; experience)

- I. **Public Administration:** Nature and scope, Role of Public Administration in a modern Welfare State; Issues & Challenges of Public Administration in Pakistan;
- II. **Bureaucracy:** Concept of Bureaucracy, Bureaucracy of Pakistan as a Change Agent;
- III. **Administrative Accountability:** Internal and External Controls; Executive Control, Legislative Control, Judicial Control, Ombudsman, Public Opinion and Pressure Groups; Problems of Administrative Accountability in Pakistan;
- IV. **Planning:** Types of Plans, Planning Process; Principles of Planning, Planning Machinery in Pakistan;
- V. PPRA Ordinance & Rules;

**Part-III: 25 Marks (Descriptive)**

(Human Resource, Financial Management and Quality Management)

**I. Human Resource and Financial Management**

Definition, Significance and Scope of Human Resource Management; Organization—Types of Organization, Theory of Organization, Principles of Organization, Organization of the Federal and Provincial Governments, Public Sector Enterprises; Approaches to Human Resource Management. Personnel Administration—Tools of Personnel Management: Selection, Training, Promotion, Compensation, Discipline; Communication, Communication Channels and Principles of Public Relations; Human Behaviour and Organizations Administration.—Elements of Financial Administration, Performance Programmed Budgeting, Capital Budget, Principles of Budgeting, Auditing and Accounting.

**II. Basic Concept of Quality Management**

ISO-9000, ISO-13000, other certifications regarding quality measurement; management, management for Results, Setting Performance Goals and Targets; Job Analysis: Job Description, Job Specification, Performance Evaluation;

**SUGGESTED READINGS**

| <b>S. No.</b> | <b>Title</b>                                 | <b>Author</b>  |
|---------------|--|--|
| 1.            | An Introduction to the Public Administration | E.N. Cladden   |
| 2.            | Bureaucracy: Modern Society                  | Pebr, M.Blau.  |
| 3.            | Public Administration for a Welfare State    | Paul Ableby  |
| 4.            | The Bureaucracy of Pakistan                  | Charles F. Kennedy   |
| 5.            | Human Resource Management                    | H.T.Graham & Roger Bennett                                 |
| 6.            | Management                                   | James A.F.Stoner, R.Eward<br>Freeman, Daniel R.Gilbert Jr. |

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

|                                     |  |
|-------------------------------------|--|
| Case No.                            | F.4-95/2022-R  |
| Particulars of post                 | <b>Deputy Director (Horticulture) (BS-18), PAK. P.W.D, Ministry of Housing and Works.</b>  |
| Minimum Qualification & Experience: | i. Second Class Grade 'C'; Master's degree in Agriculture.<br>ii. B.Sc. (Hons) degree in Agriculture with Horticulture as major subject.<br>iii. 05 years post qualification experience in the field of Horticulture/ Agriculture. |

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

- 25 MCQ Questions on Part-II.

**Part-II (Professional): 75 Marks (Subjective)****I. Introductory Horticulture**

Introduction, history, importance and future scope, Definition and divisions of horticulture, Classification of horticultural crops, Plant parts, their modifications and functions, Plant environment; climate (temperature, light, humidity etc) and soil (structure, texture, fertility etc), Phases of plant growth, Propagation of horticultural plants.

**II. Horticultural Crop Production**

Establishment of orchards, vegetable farms and ornamental gardens; site selection, layout methods, wind breaks and their role. Management practices; irrigation, manures and fertilizers, training and pruning, cultivation and weed control. Climate, soil, propagation, rootstocks, cultivars, important pests, harvesting, post-harvest handling and marketing of important horticultural crops (fruits, vegetables and ornamentals) of the region.

**III. Landscape Horticulture**

Classification of landscape plants, Growth habits, foliage and flowering effects, Propagation and maintenance of important landscape plants and turf grasses Introduction to landscape design, hardscape and softscape, Principles, elements and types of landscape, Suitability of various plants for different purposes and locations, Irrigation systems for different landscapes, Landscape planning, installation, maintenance, and budget estimation.

**SUGGESTED READINGS**

| S. No. | Title  | Author   |
|--------|--|--|
| 1.     | Handbook of Horticulture   | Chadha, K.L.                                     |
| 2.     | Introductory Horticulture.                                       | Christopher, E. P.                               |
| 3.     | Horticulture: Principles and Practices                           | Acquaah, G.                                      |
| 4.     | Principles of Horticulture                                       | Adams, C. R., K.M. Bamford and M. P. Early       |
| 5.     | Horticulture,  | Malik, M.N. National Book Foundation, Islamabad. |
| 6.     | Introductory Ornamental Horticulture                             | Arora, J.S.                                      |
| 7.     | Introduction to Landscaping Design, Construction and Maintenance | Biondo, R.J., and C.B. Schroeder                 |

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

|                                     |   |
|-------------------------------------|---|
| Case No.                            | F.4-96/2022-R   |
| Particulars of post                 | <b>Rehabilitation Specialist</b> (BS-18), National Institute of Rehabilitation Medicine, Islamabad, Ministry of National Health Services, Regulations & Coordination.   |
| Minimum Qualification & Experience: | <ul style="list-style-type: none"> <li>i. MBBS or equivalent qualification recognized by PM&amp;DC</li> <li>ii. PM&amp;DC level III qualification in Rehabilitation Medicine recognized by PM&amp;DC.</li> <li>iii. Two (2) years post qualification experience in the relevant field.</li> </ul> |

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

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

**Part-II: (Qualification Based) (Descriptive)****50 Marks**Core courses of **MBBS Degree****Part-III: (Professional) (Descriptive)****25 Marks**Core courses of Level III qualification in **Rehabilitation Medicine**.

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

|                                     |   |
|-------------------------------------|---|
| Case No.                            | F.4-97/2022-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.<br>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: 100****Time Allowed: 3 Hours**

|                                     |  |
|-------------------------------------|--|
| Case No.                            | F.4-99/2022 -R   |
| Particulars of post                 | <b>Programme Manager</b> (BS-18), Anti Narcotics Force, Ministry of Narcotics Control.   |
| Minimum Qualification & Experience: | i. MBBS or equivalent qualification recognized by PMDC.<br>ii. Registration with PMDC.<br>ii. Postgraduate Higher/ Lower diploma in Public Health/ Health Services Administration/ Primary Health Care, with three/ five years post qualification experience in Drug Addict/ Treatment & Rehabilitation Centre, respectively.<br><b>OR</b><br>i. Second Class or Grade 'C' Master's degree in Social Work/ Sociology/ Psychology/ Anthropology.<br>ii. Five (5) years post qualification experience in Drug Addict Treatment/ Rehabilitation Centre. |

**For Medical Professional**

(having MBBS degree and Lower/Higher diploma in Public Health/ Health Services Administration/ Primary Health Care.)

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

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

**Part-II: (Qualification Based) (Descriptive)****50 Marks**Core courses of **MBBS Degree****Part-III: (Professional) (Descriptive)****25 Marks**Core courses of Post Graduate Lower Diploma in **Public Health/ Health Services Administration/ Primary Health Care****For General Side**

(having Master's degree in Social Work/ Sociology/ Psychology/ Anthropology.)

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

- 25 MCQ Questions on Part-II.

**Part-II (Professional): 75 Marks (Subjective)****I. General Sociology**

1. **Society:** Meaning and characteristics. Community; meaning and characteristics. Individual and society. Relationship between individual and society.
2. **Social Control:** Mechanisms of social control-formal and informal means of social control, Anomie, Alienation and social Integration-Means of social integration in Pakistani Society.
3. **Social Problems in Pakistan:** High population growth rate, Rural –urban migration. Deviance and street crime, Unemployment, illiteracy and School dropout, Smuggling, Prostitution, Poverty, Drug Addiction, Child Labour and Abuse, Bonded

Labour, Social customs and Traditions affecting Women in Pakistan, Violence Against Women and Domestic Violence, Issues concerning the Elderly in Pakistan.

- II. **Anthropology:** Definition of anthropology, its historical development and recent trends
- III. **Contemporary Human Problems:** Poverty, social inequality, political instability, population problems, ethnic violence and terrorism etc.
- IV. **Socio-Cultural Change:** Dimension of cultural change, barriers to cultural change including (culture, psychological and political), internal dynamics for change, external dynamics for change, media and cultural change, dynamics of change in Pakistan (Trends and prospects)
- V. **Psychological Assessment:** Attributes of Psychological Measures, Validity, Reliability, Item Analysis, Norms, Modern Test Theory, Selection and Training, Educational and Clinical Assessment, Ethical and Legal Issues in Assessment.
- VI. **Sensation and Perception:** Sensory process, Perception, Gestalt Principles, Binocular and Monocular cues, Illusions and Extra Sensory Perception, Determinants of Perception
- VII. **Motivation and Emotion:** Homeostasis, Factors affecting Motivation, Biogenic and Social Motives, Measurement of Human Motivation, Theories of Motivation, Emotions, Types of Emotions, Physiological changes in Emotion, Theories of Emotions.
- VIII. **Forensic Psychology:** Psychology and Law, Investigation, Confession, Eyewitness Testimony, Working with Offenders, Juvenile Delinquents, Drug Addicts etc.

#### SUGGESTED READINGS

| S. No. | Title                                       | Author                               |
|--------|---|--------------------------------------|
| 1.     | Poverty Curtains                            | Dr. Mehboob-ul-haq                   |
| 2.     | Sociology                                   | Ogburn & Nimkoff                     |
| 3.     | Pakistani Society                           | Akbar Ahmad, S.                      |
| 4.     | Anthropology and Modern life                | Franz Boas                           |
| 5.     | Anthropology and Contemporary Human Problem | John H. Bodley                       |
| 6.     | Introduction to Psychology                  | Atkinson & Hilgard's, Fredrickson, B |
| 7.     | Social Psychology                           | Baron, R. A                          |
| 8.     | Forensic Psychology                         | Fulero, S. M., & Wrightsman          |
| 9.     | Psychology: Concepts and Connections        | Rathus, S.                           |