

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. 01/2016

| S. No | Case No. F.4- | Particulars of Post(s) | Qualifications for Posts | Test Specification | Topics of Syllabi |
|-------|---------------|---|--|--|---|
| 1. | 02/2016 | Lecturer (Fine Arts) (Female) (BS-17), Federal Government Colleges for Women, Federal Directorate of Education, Islamabad, Capital Administration and Development Division. | Second Class or Grade 'C' Master's degree in Fine Arts or equivalent. | Objective Type Test (MCQ) Part-I English = 20 marks Part-II Subject Test = 50 marks Part-III Professional Test = 30 marks | Part-I Vocabulary, Grammar Usage, Sentence Structuring Part-II (Masters Level) <ul style="list-style-type: none"> • General Concepts of Art, • Techniques of Painting, • Ancient Civilizations, • Pakistani Art and Artists, • Muslim Architectures and Muslim Art, • Medieval Art- Renaissance-Baroque-Rococo, • Print making, • Graphic Art (Printing, Etching-Woodcut, Lithography) Part-III <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Development of Education in Pakistan |
| 2. | 03/2016 | Assistant Private Secretary (BS-16), Textile Commissioner's Organization, Karachi, Ministry of Textile Industry. | i. Second Class or Grade 'C' Bachelor's degree from a University recognized by HEC ii. Minimum shorthand speed 100 W.P.M. and typing speed 50 W.P.M. iii. Must be computer literate. | <ul style="list-style-type: none"> • Typing Test with minimum Speed of 50 W.P.M • Shorthand Test with minimum Speed of 100 W.P.M | 50 Marks 50 Marks |

| S. No | Case No. F.4- | Particulars of Post(s) | Qualifications for Posts | Test Specification | Topics of Syllabi |
|-------|---------------|---|--|--|---|
| 3. | 04/2016 | Statistical Officer (BS-17), Board of Investment, Prime Minister's Office | i. Second Class or Grade 'C' Master's Degree in Statistics / Economics with Statistics as one of the subject. ii. Two (2) years post qualification experience in handling statistical data. | Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test = 80 marks | Part-I Vocabulary, Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • Introduction to Statistics, • Presentation of Data, • Measures of Central Tendency, • Measures of Dispersion, • Index Numbers, • Simple Regression and Correlation, • Time Series Analysis, • Sampling Techniques, • Testing of Hypothesis, • Techniques of Research, • Report writing and presentation, • Basic Arithmetic and I.T Knowledge. |
| 4. | 05/2016 | Assistant Private Secretary (BS-16), Pakistan Mint Lahore, Finance Division. | i. Second Class or Grade 'C' Bachelor's degree from a University recognized by HEC. ii. Minimum shorthand speed 100 W.P.M. and typing speed 50 W.P.M. iii. Must be computer literate. | <ul style="list-style-type: none"> • Typing Test with minimum Speed of 50 W.P.M • Shorthand Test with minimum Speed of 100 W.P.M | 50 Marks 50 Marks |
| 5. | 07/2016 | Assistant Private Secretary (BS-16), National Industrial Relations Commission (NIRC), Ministry of Overseas Pakistanis & Human Resource Development. | i. Second Class or Grade 'C' Bachelor's degree from a University recognized by HEC ii. Minimum shorthand speed 100 W.P.M. and typing speed 50 W.P.M. iii. Must be computer literate. | <ul style="list-style-type: none"> • Typing Test with minimum Speed of 50 W.P.M • Shorthand Test with minimum Speed of 100 W.P.M | 50 Marks 50 Marks |
| 6. | 08/2016 | Deputy Registrar (BS-17), National Industrial Relations Commission (NIRC), Ministry of Overseas Pakistanis & Human Resource Development. | i. Second Class or Grade 'C' Graduate with Law Degree. ii. Two (2) years post qualification experience as Legal Practitioner. | Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test = 80 marks | Part-I Vocabulary, Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • Code of Civil Procedure, • Code of Criminal Procedure, • Pakistan Penal Code, • Limitation Act, • Specific Relief Act. |

| S. No | Case No. F.4- | Particulars of Post(s) | Qualifications for Posts | Test Specification | Topics of Syllabi |
|-------|---------------|--|--|--|---|
| 7. | 15/2016 | Assistant Private Secretary (BS-16), in a Federal Government Organization. | i. Second Class or Grade 'C' Bachelor's degree from a University recognized by HEC ii. Minimum shorthand speed 100 W.P.M. and typing speed 50 W.P.M. iii. Must be computer literate. | <ul style="list-style-type: none"> • Typing Test with minimum Speed of 50 W.P.M • Shorthand Test with minimum Speed of 100 W.P.M | 50 Marks 50 Marks |
| 8. | 16/2016 | Translator (BS-17), National Assembly Secretariat, Islamabad | i. Second Class or Grade 'C' Master's Degree in English/Urdu from HEC recognized University ii. Three (3) years post qualification experience of Translation work from Urdu to English and Vice versa rendered in Public/ Private Sector. | Subjective Test= 100 Marks | Translation of the TEN selected passages from the following documents, available on National Assembly Website (www.na.gov.pk): <ol style="list-style-type: none"> Acts of Parliaments Bills Passed by National Assembly (NA) Govt Bills Introduced Ordinance Laid National Assembly (NA) Debates Weightage: a) Translation from English to Urdu 10X5=50 Marks b) Translation from Urdu to English 10X5=50 Marks |
| 9. | 17/2016 | Deputy Assistant Director (BS-16), Textile Commissioner's Organization, Karachi, Ministry of Textile Industry. | Bachelor's Degree in Textile Technology OR Three years post Matric Diploma in Textile Technology with five years post qualification experience in the related field. | Objective Type Test (MCQ) Part-I English = 20 marks Part-II Professional Test=80 marks | Part-I Grammar Usage, Sentence Structuring Part-II <ul style="list-style-type: none"> • General Textile Technology, • Spinning, Weaving, • Dyeing and Finishing, • Testing and Quality Control, • Fabric Design and Structure, • Business Management and Industrial Economics, • Industrial Management and Human Relations. |

**Schemes and Syllabi for Written Examination (Descriptive)
for All Posts in BS-18 & BS-19 included in Consolidated
Advertisement No. 01/2016**

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.4-01/2016-R |
| Particulars of post | Principal (BS-18), F.G. English Medium (Public Schools), Directorate of Federal Government Educational Institutions (Cantt/ Garrison), Ministry of Defence |
| Minimum Qualification & Experience: | i) Second Class or Grade 'C' Master's Degree. ii) M.Ed/ Second Class B.Ed. iii) Five year post qualification teaching and administrative experience in an educational institution. |

Part-I: 50 Marks

(Human Resource, Financial Management, Quality Management and Information Technology)

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;

III. Information Technology and MS Office

Fundamentals of Computer: CPU, Memory Devices, Types of Computers, Characteristics of Computer and related material; Application Software: Microsoft Word, Microsoft Power Point, Microsoft Excel; Search Engines, Web Design, Email, Internet Surfing, Social Networking (Facebook, Twitter, etc); General Introduction to Virus and Antivirus utilities; Programming Languages

Part-II: (Professional)**50 Marks****I. Development of Curriculum and Instructional Material**

- Elements of Curriculum.
- Relationship of Education and 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 Planning and Organization in Pakistan
- Approaches to Educational Administration: Democratic; Authoritarian; Laissez-faire
- Educational Supervision

V. Research Methods in Education

- Scientific Method and its Application in Education
- Sampling Techniques:
- Research Instruments: Questionnaire: Interview; Test; Observation; Rating Scale
- Type of Research: Basic/Applied Research; Historical Research; Descriptive Research; Correlation Research; Causal-Comparative Research; Experimental Research; Action Research; Qualitative and Quantitative Research
- Research Proposal and Report Writing

SUGGESTED READINGS

| S. No. | Title | Author |
|---------------|--|--|
| 1. | Human Resource Management | H.T. Graham & Roger Bennett |
| 2. | Management | James A.F. Stoner, R. Eward Freeman, Daniel R. Gilbert Jr. |
| 3. | Understanding Computer: Today and Tomorrow | Deborah Morley, Charles Parker |
| 4. | MS Office 365 Handbook: 2013 Edition | Kevin Wilson |
| 5. | Research in Education | JW Best |
| 6. | Integrating Education Technology into Teaching | Roblyer |
| 7. | Curriculum Development | S. M. Shahid |
| 8. | Educational Measurement and Evaluation | S. M. Shahid |
| 9. | Educational Administration | S. M. Shahid |

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

| | |
|-------------------------------------|--|
| Case No. | F.4-06/2016-R |
| Particulars of post | Deputy Director (BS-18), Board of Investment, Prime Minister's Office |
| Minimum Qualification & Experience: | <p>i. Second Class or Grade 'C' Master's Degree or equivalent in one of the following subject: Economics/ Commerce/ Business Administration/ Public Administration/ Physics/ Chemistry/ International Relations/ Chemicals/ Electronics / Mechanical Engineering.</p> <p>ii. Five (5) years post qualification experience in BS-17 and above or equivalent in Industrial Production/ Financial and Economic Analysis of Investment proposals/ Marketing, Management Development/ Economic Policy and Planning/ Industrial Policy Investment/Promotion in Commercial/ Industrial Government/ Semi- Government Organizations/ Private firms of repute.</p> |

Part-I: 50 Marks

(Human Resource, Financial Management,
Quality Management and Information Technology)

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;

III. Information Technology and MS Office

Fundamentals of Computer: CPU, Memory Devices, Types of Computers, Characteristics of Computer and related material; Application Software: Microsoft Word, Microsoft Power Point, Microsoft Excel; Search Engines, Web Design, Email, Internet Surfing, Social Networking (Facebook, Twitter, etc); General Introduction to Virus and Antivirus utilities; Programming Languages

Part-II: 50 Marks
(Job Oriented)

I. Public Policy Formulation and Implementation

- The Policy Making Process: How Policies are Made (Six including diagnosis and six stages with cautions to be exercise at each stage)
- Policy Implementation & Role of Bureaucracy (Training, Pervasive Inertia and how to break it, Lack of Decision Making, Culture of postponement and delays, Lack of resources, Political interference, Ability to say “No.”)
- Policy Analysis, The Quest for Solutions (Lack of research in policy analysis, Lack of coordination among departments, secrecy, openness)
- Policy Evaluation: Assessing The Impact of Public Policy, Program Evaluation- Success and failure of Govt.

II. Act, Ordinance, Rules etc. Relating to Investment

- Special Economic Zones Act, 2012
- Special Economic Zones Rules, 2013
- Board of Investment Ordinance, 2001
- Foreign Private Investment (Promotion & Protection) Act, 1976
- Economic Indicators (Pakistan Economic Survey 2014-15)

SUGGESTED READINGS

| S. No. | Titles | Author |
|--------|--|---|
| 1. | Human Resource Management | H.T. Graham & Roger Bennett |
| 2. | Management | James A.F. Stoner, R. Edward Freeman, Daniel R. Gilbert Jr. |
| 3. | Understanding Computer: Today and Tomorrow | Deborah Morley, Charles Parker |
| 4. | MS Office 365 Handbook: 2013 Edition | Kevin Wilson |
| 5. | Governance | Anne Mette Kjær |
| 6. | Implementing Public Policy: Governance in Theory and in Practice. | Hill M. and Hupe P. |
| 7. | Governance, Economic Policy and Reform in Pakistan | Abdus Samad |
| 8. | Public Policy: Politics, Analysis, and Alternatives, 4th Ed., CQ Press, 2012 | Kraft, Michael E., Scott R. Furlong |
| 9. | Pakistan Economic Survey 2014-15 | Finance Division |
| 10. | Relevant Rules, Acts, Ordinance and course contents mentioned in Part-II | |

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

| | |
|-------------------------------------|--|
| Case No. | F.4-10/2016-R |
| Particulars of post | Assistant Solicitor (BS-18), Ministry of Law, Justice and Human Rights |
| Minimum Qualification & Experience: | i. Bachelors 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. |

I. Definitions of Crime**II. All Provisions of:**

- i. Concept of arbitration, arbitration with or without intervention of court and in civil suits.
- ii. Establishment of Civil Courts with their Original & Appellate Jurisdiction.
- iii. The Code of Civil Procedure, 1908
- iv. Pakistan Panel Code, 1860
- v. Qanun-e-Shahdat Order, 1984
- vi. Criminal Procedure Code, 1898

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 |

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

| | |
|-------------------------------------|---|
| Case No. | F.4-11/2016-R |
| Particulars of post | Senior Mining Geologist (BS-18), Geological Survey of Pakistan, M/O Petroleum and Natural Resources |
| Minimum Qualification & Experience: | <ul style="list-style-type: none"> i. Second Class or Grade 'C' M.Sc. Degree in Geology with specialization in Mining Geology/Economic Geology or equivalent from a University recognized by the HEC. ii. Five (5) years post qualification research experience in the field of Geology. iii. Must have published at least three (3) research papers in the fields of Geology. |

Geology: 100 Marks**I. Mineral and Energy Resources**

Introduction of geological exploration/prospecting. Brief description of hydrocarbons, coal, gemstones, copper, lead, zinc, iron, gold, chromite, manganese, salt, gypsum, bauxite, sulphur, barite, fluorite, clays, phosphorite, building and dimension stones, industrial rocks and minerals, radioactive minerals and rocks with special reference to economic mineral deposits in Pakistan.

Origin, occurrence, and depositional environments of coal; coal Constitution and kinds of coals. Coal rank, grade and calorific value. Coal deposits of Pakistan with reference to Thar Coal. Geothermal energy resources of Pakistan.

II. Mining Geology and Mineral Economics

Terms and definitions of mine workings. Openings through adits, shafts, inclines, vertical cross cuts. Choices of mining methods and modes of extraction. Structural controls in mining: bedding, faults, joints folds, fractures and intrusion. Correlation of data Spatial relationship of seams. Surface and underground, mapping methods. Calculation of grade ad tonnage of ore. Gases in mines, spontaneous combustion. Rock pressure and support, collapse of working faces, pillars, longwall timbering, benches, safety measures. Waste disposal management, impact of mining on land. Water, air and biological resources. Remedies, long term planning and rehabilitation. Estimation of ore reserves/ore resources: Factors affecting mine size grade and distribution of ore body, or reserves, prediction and estimation of cost. Expenditure: Capital cost, equipment cost, infrastructure cost and mine excavation cost, operation cost, power and fuel charges, labour charges, maintenance of plant and equipment, drilling and blasting charges, haulage, ore, grade control, high grade mining priority, Development decisions based on economic evaluation

III. Engineering and Environmental Geology

Rock and soil mechanics and its application in civil engineering; Rock mass characteristics; Geotechnical studies of rocks and soils; Geological factors and strength of rocks; Study of geological factors in relation to the construction of buildings and foundations, roads, highways, tunnels, dams and bridges; Application of geophysical methods for site investigation; Construction materials; Mass movement, their causes and prevention.

IV. Economic and Applied Geology

Metallic and Non-metallic mineral resources of Pakistan. Mineral-based industries. Overview of Recodec Copper. Radioactive minerals and their occurrences in Pakistan. Gemstones of Pakistan

Geology of Reservoirs, Dams .Highways and Tunnels. Major natural hazards and their Impact on the environment with special reference to Pakistan.

SUGGESTED READINGS

| S. No. | Title | Author |
|--------|---|---|
| 1. | Geology of Pakistan | Bender, F.K. & Raza, H.A., |
| 2. | Techniques in Mineral Exploration | Reedman, J.H. |
| 3. | Exploration and Mining Geology | Peters, W.E., |
| 4. | Mining Geology | Mckinstry, H.B., |
| 5. | Environmental Geology | Montgomery, C.W., |
| 6. | Economic Geology: Principles and Practice | Walter L. Pohl |
| 7. | Energy Resources | Brown and Skipsy |
| 8. | Pakistan Energy Yearbook 2012 | Ministry of Petroleum and Natural Resources Hydrocarbon Development Institute of Pakistan. Islamabad |

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

| | |
|-------------------------------------|--|
| Case No. | F.4-12/2016-R |
| Particulars of post | Deputy District Attorney, (BS-18), Islamabad Capital Territory (ICT), Ministry of Interior |
| Minimum Qualification & Experience: | Law Graduate with at least five (5) years post qualification practice as an Advocate/Dealing with legal Matters. |

I. Definitions of Crime**II. All Provisions of:**

- i. Concept of arbitration, arbitration with or without intervention of court and in civil suits.
- ii. Establishment of Civil Courts with their Original & Appellate Jurisdiction.
- iii. The Code of Civil Procedure, 1908
- iv. Pakistan Panel Code, 1860
- v. Qanun-e-Shahdat Order, 1984
- vi. Criminal Procedure Code, 1898

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 form 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 |

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

| | |
|-------------------------------------|--|
| Case No. | F.4-13/2016-R |
| Particulars of post | Director (BS-19), Directorate of Dock Workers Safety H.Qs., Ministry of Ports and Shipping |
| Minimum Qualification & Experience: | <ul style="list-style-type: none"> i. Bachelor's Degree in Mechanical or Electrical Engineering. ii. Twelve (12) years post qualification experience in testing the lifting appliances/ inspection of loading/discharging of Cargo on Ports in Semi-Government/ Government Organization. iii. Knowledge of Labour Laws/ Dock Labourers Act and the Pakistan Dock Labourers Regulations. |

Part-I: 20 Marks**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. Laws about Ports and Shipping

Labour Laws, Dock Labourers Act, Pakistan Dock Labourers Regulations

Part-II (Engineering): 80 Marks**I. Mechanical Engineering Fundamentals**

Mechanics and Strength of Materials: Concept of Stress and Strain, bending, torsion, geometric properties of areas, principal stresses, Tensile testing, Stress- Strain curve, True Stress & Strain, Shear Stress & Strain, Concept of elastic and plastic deformation, Yield & ultimate Tensile strengths, Elongation, Toughness and Resilience, Ductility and Malleability, Hardness Testing, Brinell and Rock well Hardness test, bending moment,

Fluid Mechanics: Properties and basics of fluid mechanics, loss of head, power transformation by fluids, pumps, turbines. Fluid static's, Fluid dynamics, Types of flow: Turbulent and Laminar, Reynold's number.

Manufacturing: Different manufacturing processes like Casting, Forging, Machining, Rolling, Extrusion, Wire-drawing, welding, Turning (lathe), Milling, Shaping, Gear cutting, Drilling, Fitting.

II. Electricity & Electronics

Electricity & Magnetism; Electrical potential, Resistance, Laws of resistance, Conductance, Conductivity, Impedance, Ohm law, Resistance in series and in parallel, practical resistors, work, power, Energy, Joule's law of electric field intensity, Gauss's Theorem, Capacitor, Capacitance, Capacitors in parallel and series. Force on a conductor in a magnetic field, electrical and magnetic circuits, leakage flux, Relation between magnetism and electricity, Induced emf, induced current and directions, Faraday's laws of electromagnetic inductions, Lenz's law, dynamically induced emf, Self inductance, mutual inductance and inductance in series/parallel, magnetic hysteresis, Energy stored in magnetic field, Generation of alternating currents and voltages.

III. Electrical Machines

DC Motors: Shunt, Series and Compound Motors, Speed and Torque Relations. Transformers: Principle, Construction, Voltage transformation ratio, Step-up/stepdown transformers, Copper & Iron Losses, Transformer connections; delta and star.

AC Motors: Induction motor, Synchronous motor, Performance, Efficiency. Single phase and three phase Motors.

Generators: Principle, Construction, Different components of generators. AC Generators, DC Generators.

SUGGESTED READINGS

| S. No. | Title | Author |
|--------|---|---|
| 1. | Human Resource Management | H.T.Graham & Roger Bennett |
| 2. | Management | James A.F.Stoner, R.Eward Freeman, Daniel R.Gilbert Jr. |
| 3. | Fluid mechanics with engineering applications | Finnemore/ Franzini. |
| 4. | Schaum Outline Series; Strength of Materials | Williym A. Nash |
| 5. | Fluid Mechanics | Lewitt |
| 6. | Manufacturing Processes for Engineering Materials | Kalpakgjian |
| 7. | Electrical Technology | B.L. Tharaja |
| 8. | Electronic Devices and Circuits. | Bogart |
| 9. | DC Machines | P.C. Sen |
| 10. | Semiconductors | Manzar Saeed |

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

| | |
|-------------------------------------|---|
| Case No. | F.4-14/2016-R |
| Particulars of post | Deputy Director (BS-18), Geological Survey of Pakistan, Ministry of Petroleum and Natural Resources. |
| Minimum Qualification & Experience: | <p>i. Second Class or Grade 'C' M.Sc. Degree in Geology or equivalent qualification</p> <p style="text-align: center;">OR</p> <p>Second Class or Grade 'C' B.Sc. (Hons) degree in Geology or equivalent from a University recognized by the HEC.</p> <p>ii. Five (5) years post qualification research experience in the fields of Geology.</p> <p>iii. Must have published three (3) research papers in the fields of Geology.</p> |

Geology: 100 Marks

- I. Stratigraphy and Paleontology:** Principles of stratigraphy; laws of superposition and faunal succession. Geological time scale with divisions. Classification and nomenclature of stratigraphic units: lithostratigraphic units, biostratigraphic units and chronostratigraphic units.

Introduction to fossils and their significance; modes of fossilization, Study of morphology, range and broad classification of major invertebrate phyla; Introduction to micro fossils; Introduction to Paleobotany; Introduction and classification of major vertebrates; Introduction to micropaleontology

- II. Mineralogy :** Classification of minerals; Study of internal structure; polymorphism and isomorphism; paragenesis; Physical and optical properties of the common silicate and non-silicate mineral groups; Introduction to crystallography; elements of symmetry, study; normal classes of crystallographic systems.

- III. Structural Geology and Tectonics:** Stress-strain concepts; factors which control the mechanical behaviour of materials; Folds, Faults, Joints, Foliation: terminology, classification and relationship with bedding; Lineation, Unconformity.

Plate tectonics theory; Geological evidences for continental drift; Sea-floor spreading; Oceanic ridges; Continental rifts; Intra-oceanic islands; Hot spot and Mantle plumes; Wilson Cycle; Tectonic framework of Pakistan.

- IV. Sequence Stratigraphy:** Introduction, history, concept and significance of sequence stratigraphy; Data sources: seismic reflections, outcrops, well logs, core and seismic facies; Sea level changes, their causes and effects; Accommodation, eustatic and relative sea curve; Hierarchy of sequence stratigraphic elements; Types of sequences and systems tracts.

- V. Mineral and Energy Resources:** Introduction of geological exploration/prospecting. Brief description of hydrocarbons, coal, gemstones, copper, lead, zinc, iron, gold, chromite, manganese, salt, gypsum, bauxite, sulphur, barite, fluorite, clays, phosphorite, building and dimension stones, industrial rocks and minerals, radioactive minerals and rocks with special reference to economic mineral deposits in Pakistan.

Origin, occurrence, and depositional environments of coal; coal Constitution and kinds of coals. Coal rank, grade and calorific value. Coal deposits of Pakistan with reference to Thar Coal. Geothermal energy resources of Pakistan.

VI. Engineering and Environmental Geology: Rock and soil mechanics and its application in civil engineering; Rock mass characteristics; Geotechnical studies of rocks and soils; Geological factors and strength of rocks; Study of geological factors in relation to the construction of buildings and foundations, roads, highways, tunnels, dams and bridges; Application of geophysical methods for site investigation; Construction materials; Mass movement, their causes and prevention.

VII. Economic and Applied Geology: Metallic and Non-metallic mineral resources of Pakistan. Mineral-based industries. Overview of Recodec Copper. Radioactive minerals and their occurrences in Pakistan. Gemstones of Pakistan

Geology of Reservoirs, Dams .Highways and Tunnels. Major natural hazards and their Impact on the environment with special reference to Pakistan.

SUGGESTED READINGS

| S. No. | Title | Author |
|--------|--|---|
| 1. | Principles of Paleontology | Raup, D.M. & Stanley, S.M |
| 2. | Principles of Sedimentology and Stratigraphy | Boggs, S |
| 3. | Mineralogy | Perkins, D |
| 4. | Plate Tectonics – Geodynamics | Moore, E.M. & Twiss, R.J |
| 5. | Structural Geology | Twiss, R.J. & Moore, E.M., |
| 6. | Sequence Stratigraphy | Emery, D. & Myers, K.J., |
| 7. | Geology of Pakistan | Bender, F.K. & Raza, H.A., |
| 8. | Environmental Geology | Montgomery, C.W., |
| 9. | Economic Geology: Principles and Practice | Walter L. Pohl |
| 10. | Energy Resources | Brown and Skipsy |
| 11. | Pakistan Energy Yearbook 2012 | Ministry of Petroleum and Natural Resources Hydrocarbon Development Institute of Pakistan. Islamabad |