FEDERAL PUBLIC SERVICE COMMISSION  
(Curriculum & Research Wing)  

Scheme and Syllabi for Screening/Professional Tests as well as Descriptive Examination Relating to Posts Advertised Vide Consolidated Advertisement No. 06/2015

<table>
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<tr>
<th>S. No</th>
<th>Case No.</th>
<th>Particulars of Post(s)</th>
<th>Qualifications for Posts</th>
<th>Test Specification</th>
<th>Main Topics for MCQ Test</th>
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</thead>
</table>
| 1.    | 74/2015  | Assistant Mechanical Engineer (BS-17), Mechanical Engineering Department of Pakistan Railways, (Railway Board) Ministry of Railways. | Bachelor's degree in Mechanical Engineering or equivalent qualification. Registration with PEC required | Objective Type Test (MCQ)  
Part-I  
English = 20 marks  
Part-II  
Professional Test = 80 marks | Part-I  
Vocabulary, Grammar Usage, Sentence Structuring.  
Part-II  
- Industrial Materials  
- Machine Design and Drawing  
- Mechanics of Machines  
- Production Management & Quality Control  
- Workshop Technology  
- Hydraulic Machines  
- Mechanics and Strength of Materials  
- Manufacturing Processes like Casting, Forging, Machining, Rolling, Extrusion, Welding, Drilling |
| 2.    | 76/2015  | Assistant Director (Stores) (BS-17), Geological Survey of Pakistan, Ministry of Petroleum and Natural Resources.  
i. Second Class or Grade ‘C’ M.A/M.Sc. degree from a University recognized by the HEC.  
ii. Two (2) years post qualification experience of working in Procurement, control distribution and maintenance of spare parts of vehicles and other Government stores. | Objective Type Test (MCQ)  
Part-I  
English = 20 marks  
Part-II  
Professional Test = 80 marks | Part-I  
Vocabulary, Grammar Usage, Sentence Structuring.  
Part-II  
- Basic Arithmetic  
- General Science  
- Basic knowledge of I.T  
- Procedures of Receipt and Issue of Stores  
- Stores handling procedures with relation to following topics:-  
  a. Stock Taking  
  b. Care and Preservation of Store items  
  c. Ware House Management  
- Public Procurement Rules, 2004 |
<table>
<thead>
<tr>
<th>S. No</th>
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</tr>
</thead>
</table>
| 3.    | 77/2015  | Assistant Director (BS-17), Geological Survey of Pakistan, Ministry of Petroleum and Natural Resources. | Second Class or Grade ‘C’ M.Sc. degree in Geology or equivalent qualification from a University recognized by the HEC | Objective Type Test (MCQ) | Part-I: Vocabulary, Grammar Usage, Sentence Structuring.  
Part-II:  
- Physical Geology  
- Stratigraphy  
- Structural Geology  
- Plate Tectonics  
- Palaeontology (Invertebrate & Vertebrate)  
- Geochemistry  
- Geological Mapping  
- Petroleum Geology  
- Engineering and Environmental Geology  
- Mineral and Energy Resources |
|       |          |                        |                          | Part-I  
English = 20 marks  
Part-II  
Professional Test = 80 marks |                       |
| 4.    | 78/2015  | Statistical Officer (BS-17), Geological Survey of Pakistan, Ministry of Petroleum and Natural Resources. | i. Second Class or Grade ‘C’ M.A/M.Sc. degree in Economics/ Mathematics/ Statistics or Commerce or equivalent from a university recognized by the HEC.  
ii. Two (2) years post qualification experience of research or handling of economics or statistical data. | Objective Type Test (MCQ) | Part-I: Vocabulary, Grammar Usage, Sentence Structuring.  
Part-II:  
- 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 Skills,  
- Basic Arithmetic and I.T Knowledge. |
|       |          |                        |                          | Part-I  
English = 20 marks  
Part-II  
Professional Test = 80 marks |                       |
<table>
<thead>
<tr>
<th>S. No</th>
<th>Case No. F.4-</th>
<th>Particulars of Post(s)</th>
<th>Qualifications for Posts</th>
<th>Test Specification</th>
<th>Main Topics for MCQ Test</th>
</tr>
</thead>
</table>
| 5.    | 80/2015       | Inspector Customs/Intelligence Officer (BS-16), Federal Board of Revenue, Revenue Division. | i. Second Class or Grade ‘C’ Bachelor’s degree from a recognized University with Economics, Commerce, Statistics, Accounting, Computer Science, Law, Pharmacy, Chemistry or Physics as one of the subjects or B.Sc. Engineering in any speciality.  
ii. Computer literacy up to the level of MS Word, MS Power Point and MS Excel.  
iii. MINIMUM PHYSICAL STANDARD: For Male candidates: Height 5′-6″ Chest 32″-33.5″ For Female Candidates: Height 5′-2″. (Documentary proof from authorized Medical authorities required). | Objective Type Test (MCQ)  
Part-I  
English = 20 marks  
Part-II  
General Intelligence Test = 80 marks | Part-I  
Grammar Usage, Sentence Structuring  
Part-II  
- Basic Arithmetic.  
- Current Affairs.  
- Pakistan Affairs & Islamic Studies  
- Everyday/General Science  
Note : (Equal weightage for each topic at Part-II) |
| 6.    | 81/2015       | Preventive Officer (BS-16), Federal Board Of Revenue, Revenue Division.             | Second Class or Grade ‘C’ M.Sc. degree in Mathematics or Second Class or Grade ‘C’ M.Sc. in Computer Science (MCS) with specialization in GIS or equivalent qualification from a University recognized by the HEC.                                      | Objective Type Test (MCQ)  
Part-I  
English ≥20 marks  
Part-II  
Professional Test ≥80 marks | Part-I  
Vocabulary, Grammar Usage, Sentence Structuring.  
Part-II  
- Geographic Data: Types and Representation  
- Data Capturing and Automation  
- Photogrammetry  
- Remote Sensing  
- Global Positioning System (GPS)  
- Database for GIS  
- Geographical Analysis  
- Elementary Mathematics: Geometry, Trigonometric Functions  
- Surveying Techniques  
- Principles of Cartography |
| 7.    | 83/2015       | Photogrammetrist (BS-17), Geological Survey of Pakistan, Ministry of Petroleum and Natural Resources. | Second Class or Grade ‘C’ M.Sc. degree in Mathematics or Second Class or Grade ‘C’ M.Sc. in Computer Science (MCS) with specialization in GIS or equivalent qualification from a University recognized by the HEC.                                      | Objective Type Test (MCQ)  
Part-I  
English ≥20 marks  
Part-II  
Professional Test ≥80 marks | Part-I  
Vocabulary, Grammar Usage, Sentence Structuring.  
Part-II  
- Geographic Data: Types and Representation  
- Data Capturing and Automation  
- Photogrammetry  
- Remote Sensing  
- Global Positioning System (GPS)  
- Database for GIS  
- Geographical Analysis  
- Elementary Mathematics: Geometry, Trigonometric Functions  
- Surveying Techniques  
- Principles of Cartography |
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<th>Main Topics for MCQ Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>84/2015</td>
<td>Chemist (BS-17), Geological Survey of Pakistan, Ministry of Petroleum and Natural Resources.</td>
<td>Second Class or Grade ‘C’ M.Sc. degree in Chemistry with specialization in analytical/inorganic/physical or geochemistry from a University recognized by the HEC.</td>
<td>Objective Type Test (MCQ) <strong>Part-I</strong>&lt;br&gt;English = 20 marks&lt;br&gt;<strong>Part-II</strong>&lt;br&gt;Professional Test = 80 marks</td>
<td><strong>Part-I</strong>&lt;br&gt;Vocabulary, Grammar Usage, Sentence Structuring. <strong>Part-II</strong>&lt;br&gt;- Basic Concept of Analytical Chemistry.&lt;br&gt;- Chemical Analysis of Water&lt;br&gt;- Theory, Technique and Calculation of Volumetric and Gravimetric Analysis.&lt;br&gt;- Coal Analysis Particularly Analysis of Proximate and Ultimate&lt;br&gt;- Theory, Principals, Uses and Working of Atomic Absorption Spectrophotometer and Flame Photometer&lt;br&gt;- Oxidation-Reduction Titration&lt;br&gt;- Decomposition Techniques of Rock and Minerals&lt;br&gt;- Method of Maintaining Accuracy/Precision in Chemical Analysis</td>
</tr>
<tr>
<td>9.</td>
<td>85/2015</td>
<td>Charge/Staff Nurse (Female) (Civilian) (BS-16), Military Hospitals, (Defence Division) Ministry of Defence.</td>
<td>i. Bachelor’s Degree in Nursing or equivalent qualification recognized by the Pakistan Nursing Council. &lt;br&gt;ii. Registration with Pakistan Nursing Council. OR&lt;br&gt;i. Three (3) years Diploma in Nursing. &lt;br&gt;ii. One (1) year Course/ Certificate in Midwifery. &lt;br&gt;iii. Registration with Pakistan Nursing Council.</td>
<td>Objective Type Test (MCQ) <strong>Part-I</strong>&lt;br&gt;English = 20 marks&lt;br&gt;<strong>Part-II</strong>&lt;br&gt;Professional Test=80 marks</td>
<td><strong>Part-I</strong>&lt;br&gt;Grammar Usage, Sentence Structuring <strong>Part-II</strong>&lt;br&gt;- Basic Medical Sciences&lt;br&gt;- General Nursing&lt;br&gt;- Ward Administration&lt;br&gt;- Hospitality of the Patients&lt;br&gt;- Care vs. Cure for Health Management</td>
</tr>
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</tbody>
</table>
| 10.   | 86/2015  | Demonstrator (Female) (BS-16), Directorate of Federal Government Educational Institution (Cantts/Garrisons), Ministry of Defence. | Second Class or Grade ‘C’ Master’s Degree in Physics/ Chemistry/ Biology. | Objective Type Test (MCQ) | Part-I
Grammar Usage, Sentence Structuring
Part-II
- Physics:
  - Heat & Thermodynamics,
  - Electrostatics,
  - Electromagnetism,
  - Waves and Optics
- Chemistry:
  - Thermodynamics,
  - Nature, Properties and States of Matter,
  - Gases, Liquids & Solids,
  - Organic Chemistry
- Biology:
  - Viruses & Algae
  - Bryophyte
  - Protozoa
  - Mollusca
  - Maintenance and Management of Science Laboratories. |
|       |          |                        |                          | Part-I            |                         |
|       |          |                        |                          | Part-II           |                         |
|       |          |                        |                          | English = 20 marks |                         |
|       |          |                        |                          | General Science   |                         |
|       |          |                        |                          | Test=80 marks     |                         |
| 11.   | 87/2015  | Demonstrator (Male) (BS-16), Directorate of Federal Government Educational Institution (Cantts/Garrisons), Ministry of Defence. |                        | Objective Type Test (MCQ) | Part-I
Grammar Usage, Sentence Structuring
Part-II
- Physics:
  - Heat & Thermodynamics,
  - Electrostatics,
  - Electromagnetism,
  - Waves and Optics
- Chemistry:
  - Thermodynamics,
  - Nature, Properties and States of Matter,
  - Gases, Liquids & Solids,
  - Organic Chemistry
- Biology:
  - Viruses & Algae
  - Bryophyte
  - Protozoa
  - Mollusca
  - Maintenance and Management of Science Laboratories. |
|       |          |                        |                          | Part-I            |                         |
|       |          |                        |                          | Part-II           |                         |
|       |          |                        |                          | English = 20 marks |                         |
|       |          |                        |                          | General Science   |                         |
|       |          |                        |                          | Test=80 marks     |                         |
| 12.   | 88/2015  | Librarian (Male) (BS-16), Directorate of Federal Government Educational Institution (Cantts/Garrisons), Ministry of Defence. | Second Class or Grade ‘C’ Bachelor’s Degree with Diploma in Library Science. OR Bachelor of Library Science. | Objective Type Test (MCQ) | Part-I
Grammar Usage, Sentence Structuring
Part-II
- Information Sources and Services
- Classification: Theory and Practice
- Cataloguing: Theory and Practice
- Procurement and Maintenance of Library Books
- Management of Libraries & Information Centres
- Library Automation/Information Storage & Retrieval
- Research Methods & Techniques for Librarians
- Public Records, Rare Material & their Conservation
- Management of Serials Publications
- Rules & Procedure regarding Write Off the Library Losses |
<p>|       |          |                        |                          | Part-I            |                         |
|       |          |                        |                          | Part-II           |                         |
|       |          |                        |                          | English = 20 marks |                         |
|       |          |                        |                          | Professional Test=80 marks |                         |</p>
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<tbody>
<tr>
<td>13.</td>
<td>90/2015</td>
<td>Inspector (Legal) (BS-16), Anti Narcotics Force, Ministry of Narcotics Control.</td>
<td>Second Class or Grade ‘C’ Bachelor Degree in Law or equivalent qualification recognized by the HEC.</td>
<td>Objective Type Test (MCQ)</td>
<td>Part-I: Grammar Usage, Sentence Structuring</td>
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<td>Part-II:</td>
<td>• Duties and responsibilities of Investigation Officers (Criminal Procedure Code)</td>
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<td>• Anti Narcotics Force Act, 1997,</td>
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<td>• Control of Narcotics Substances Act, 1997,</td>
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<td>• Sections of Pakistan Penal Code related to Anti Narcotics.</td>
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<td>• Basic knowledge of “Qanun-e-Shahadat Order”, 1984.</td>
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<td>• International Conventions and Agreements on Drug Control</td>
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<td>• Role of United Nations Organization for Drug Control (UNODC)</td>
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<td>• Sources of Terrorist Financing</td>
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<td>14.</td>
<td>92/2015</td>
<td>Charge/Staff Nurse (BS-16), Federal Government Polyclinic, Islamabad, Capital Administration and Development Division.</td>
<td>i. Registered Nurse and Registered Midwife with PNC.</td>
<td>Objective Type Test (MCQ)</td>
<td>Part-I: Grammar Usage, Sentence Structuring</td>
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<td>ii. For Male one year course/ certificate in nursing related field in lieu of midwifery.</td>
<td>Part-II:</td>
<td>• Basic Medical Sciences</td>
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<td>• General Nursing</td>
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<td>• Hospitality of the Patients</td>
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<td>• Care vs. Cure for Health Management</td>
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<td>15.</td>
<td>93/2015</td>
<td>Assistant Executive Engineer (Civil) (BS-17), Pak. PWD, Ministry of Housing &amp; Works.</td>
<td>Bachelor’s Degree in Engineering in Civil from a recognized University.</td>
<td>Objective Type Test (MCQ)</td>
<td>Part-I: Vocabulary, Grammar Usage, Sentence Structuring</td>
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<td>Part-II:</td>
<td>• Building Material &amp; Building Construction,</td>
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<td>• Surveying &amp; Levelling,</td>
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<td>• Hydraulic &amp; Hydrology,</td>
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<td>• Soil Mechanics &amp; Foundation,</td>
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<td>• Concrete Technology &amp; R.C.C Structure Design,</td>
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<td>• Construction Management,</td>
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<td>• Structural Design Applications,</td>
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<td>• Engineering Materials,</td>
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<td>• Reinforced Concrete,</td>
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<td>• Ground Improvement,</td>
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<td>• Earth and Rock Structure.</td>
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</tbody>
</table>
Syllabi for Written Examination (Descriptive)  
for all posts in BS-18 & BS-19

PAPER-I: ENGLISH (100 MARKS)

(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 sentence 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**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>English Grammar in Use</td>
<td>Raymond Murphy (Cambridge University Press)</td>
</tr>
<tr>
<td>2.</td>
<td>Practical English Usage</td>
<td>M. Swan (Oxford University Press)</td>
</tr>
<tr>
<td>4.</td>
<td>A University English Grammar</td>
<td>R. Quirk &amp; S. Greenbaum (ELBS; Longmans)</td>
</tr>
<tr>
<td>5.</td>
<td>Write Better, Speak Better</td>
<td>Readers Digest Association</td>
</tr>
</tbody>
</table>
PAPER-II: PROFESSIONAL (100 MARKS)
Assistant Professor Statistics (Male) (BS-18),
Federal Government Educational Institutions (Cantts/Garrisons), M/O Defence.
(Case No. 75/2015)

MINIMUM QUALIFICATION/ EXPERIENCE: Ph.D. Degree in Statistics with one (1) year
post qualification teaching experience at College/ University level OR M. Phil Degree in Statistics
with three (3) years post qualification teaching experience at College/ University level OR Second
Class or Grade ‘C’ Master’s Degree in Statistics with five (5) years post qualification teaching
experience at College/ University level.

Part-I: (Statistics) 50 Marks

I. Descriptive Statistics
Definition, Importance and scope of Statistics, Descriptive and Inferential Statistics,
Presentation of the Data, Tables, Graphs and Charts: Stem-and leaf diagram, Box
and Whisker Plots. Measures of Central Tendency/location, Measures of
Dispersion/Variability: Measures of Skewness and Kurtosis.

II. Basic Probability
Basic Probability Concepts, Additive and Multiplicative laws of Probability, Joint and
Marginal Probabilities, Conditional Probability and Statistical Independence, Bayes’
rule. Concept of a Random Variable, Mathematical Expectations, Discrete and
Continuous Random Variables, Probability Distribution, Mean and Variance of a
discrete random variables.

III. Probability Distributions
Discrete and Continuous Probability Distributions. Properties & applications of
Binomial, Poisson, Hyper-geometric Distributions. Normal Distribution and its
properties, Standard Normal Curve, Normal approximation to Binomial and Poisson
distribution.

IV. Regression Analysis & Correlation Analysis
Concepts of Regression and Correlation and their application, Simple and Multiple
Linear Regression (upto three variables), Estimation of the Parameters, Method of
least square, Inference regarding regression parameters

Correlation, Correlation Coefficient, Properties of Correlation Coefficient, Inference
regarding correlation coefficient, Partial Correlation and Multiple Correlation (upto
three variables).

V. Sampling & Sampling Distributions
Population and Sample, Advantages of Sampling, Sampling Design, Probability
&Non-Probability Sampling techniques. Brief Concepts of Simple Random, Stratified,
Systematic, Cluster, Multiple and Multistage Sampling. Purposive, Quota Sampling,
Convenience & Accidental Sampling.
Sampling with and without replacement, Application of Central Limit Theorem in Sampling, Sampling Distribution of Mean, difference between two Means, Proportion, difference between two Proportion and Variance.

VI. Statistical Inferences


Part-II: (Professional) 50 Marks

I. Development of Curriculum and Instructional Material
- Elements of Curriculum.
- Relationship of Education and Curriculum

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

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Principles and Procedures of Statistics</td>
<td>Steel, R and Torrie, J.H.</td>
</tr>
<tr>
<td>2.</td>
<td>Introduction to Statistical Theory, Part-I &amp; II</td>
<td>Chaudhry, S.M. and Kamal, S.</td>
</tr>
<tr>
<td>4.</td>
<td>Fundamentals of Modern Statistical Methods</td>
<td>Wilcox, R.</td>
</tr>
<tr>
<td>5.</td>
<td>Statistical Methods</td>
<td>Aggarwal, Y.P.</td>
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<tr>
<td>6.</td>
<td>Research in Education</td>
<td>JW Best</td>
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<tr>
<td>7.</td>
<td>Integrating Education Technology into Teaching</td>
<td>Roblyer</td>
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<tr>
<td>8.</td>
<td>Curriculum Development</td>
<td>S. M. Shahid</td>
</tr>
<tr>
<td>10.</td>
<td>Educational Administration</td>
<td>S. M. Shahid</td>
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</table>
MINIMUM QUALIFICATION: Second Class or Grade ‘C’ M.Sc. degree in Geology or equivalent qualification from a University recognized by the HEC.

EXPERIENCE: (i) Post qualification Research experience of twelve (12) years in the field of Geology including three (3) years experience to plan, organize, conduct and supervise geological field programme for geological surveys. (ii) Must have published five (5) research papers in the fields of Geology.

Geology: 100 Marks

I. Stratigraphy and Palaeontology
   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 behavior 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**


**SUGGESTED READINGS**

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<thead>
<tr>
<th>S. No.</th>
<th>Title</th>
<th>Author</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Principles of Paleontology</td>
<td>Raup, D.M. &amp; Stanley, S.M.</td>
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<td>2.</td>
<td>Principles of Sedimentology and Stratigraphy</td>
<td>Boggs, S</td>
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<td>3.</td>
<td>Mineralogy</td>
<td>Perkins, D</td>
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<td>4.</td>
<td>Plate Tectonics – Geodynamics</td>
<td>Moores, E.M. &amp; Twiss, R.J.</td>
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<td>5.</td>
<td>Structural Geology</td>
<td>Twiss, R.J. &amp; Moores, E.M.,</td>
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<td>6.</td>
<td>Sequence Stratigraphy</td>
<td>Emery, D. &amp; Myers, K.J.,</td>
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<td>7.</td>
<td>Geology of Pakistan</td>
<td>Bender, F.K. &amp; Raza, H.A.,</td>
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<td>8.</td>
<td>Environmental Geology</td>
<td>Montgomery, C.W.,</td>
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<td>10.</td>
<td>Energy Resources</td>
<td>Brown and Skipsy</td>
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<td>11.</td>
<td>Pakistan Energy Yearbook 2012</td>
<td>Ministry of Petroleum and Natural Resources</td>
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<td>Hydrocarbon Development Institute of Pakistan.</td>
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<td>Islamabad</td>
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</table>
MINIMUM QUALIFICATION: Bachelor’s Degree in Law and Urdu as an elective subject at Bachelor level from a University/College recognized by the HEC.

EXPERIENCE: Five (5) years post qualification experience of translation from English to Urdu.

Translation of some selected portions from English to Urdu and Urdu to English from the following Statutes:

i. The Code of Civil Procedure, 1908
ii. Pakistan Panel Code, 1860
iii. Qanun-e-Shahdat Order, 1984
iv. Criminal Procedure Code, 1898
v. Civil Courts Ordinance, 1962

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<td>1.</td>
<td>Pakistan Panel Code, 1860</td>
<td>M. Mahmoud</td>
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<td>2.</td>
<td>Criminal Procedure Code, 1898</td>
<td>Shaukat Mahmood</td>
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<tr>
<td>3.</td>
<td>Qanun-e-Shahdat Order, 1984</td>
<td>Justice (R) Khalid ur Rahman Khan as adapted from Principles and Digest of the Law of Evidence by M. Monir</td>
</tr>
<tr>
<td>5.</td>
<td>Civil Courts Ordinance, 1962</td>
<td>Nisar Ahmad Nisar</td>
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