

**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. 06/2016**

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Topics of Syllabi
1.	79/2016	Senior Teacher (Female) (BS-17), A. Mathematics B. Biology C. Chemistry D. Physics E. English F. Economics Federal Government Schools, Federal Directorate of Education, Capital Administration & Development Division.	Second Class or Grade "C: Master's degree in the relevant subject with B.Ed/ M.Ed	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Subject Test = 50 marks <b>Part-III</b> Professional Test = 30 marks  <b>Note:</b> ▪ For the subject of English, English part for 20 marks will not be included. It will be 70% subject Test and 30% Professional Test.	<b>For (A) Mathematics</b> <b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring <b>Part-II (Master's Level)</b> • Calculus/Differentiation, Integration, Limits of Continuity • Discrete Structures/Discrete Mathematics, • Communication Skills for Mathematicians, • Computing Tools for Mathematicians, • Classical Mechanics, • Mathematical Statistics, • Real Analysis, • Mathematical Spaces (Sets, Vector Spaces, Metric Spaces, Topological Spaces, Tensors) • Differential Equations. <b>Part-III</b> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Development of Education in Pakistan  <b>For (B) Biology</b> <b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring <b>Part-II (Master's Level)</b> • Theories of Evolution, • Multiple Alleles, • Nucleic Acids, • Cell Division, • Nutrition, • Ecosystem, • Mendelian laws of inheritance, • Diagnostic Characteristics of all the phyla or invertebrates and chordates, • Division of Plants

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					<p><b>Part-III</b></p> <ul style="list-style-type: none"> <li>• Teaching Techniques and Methodology</li> <li>• Classroom Management and Discipline</li> <li>• Testing and Evaluation</li> <li>• Development of Education in Pakistan</li> </ul> <p><b>For (C) Chemistry</b></p> <p><b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring</p> <p><b>Part-II (Master’s Level)</b></p> <ul style="list-style-type: none"> <li>• Chemical Kinetics,</li> <li>• Chemical Equilibrium,</li> <li>• Quantum Theory of Atom,</li> <li>• Synthetic Chemistry &amp; Polymers,</li> <li>• Reaction Mechanism,</li> <li>• Green Chemistry,</li> <li>• Spectroscopy,</li> <li>• Nano Technology,</li> <li>• Colloidal State.</li> </ul> <p><b>Part-III</b></p> <ul style="list-style-type: none"> <li>• Teaching Techniques and Methodology</li> <li>• Classroom Management and Discipline</li> <li>• Testing and Evaluation</li> <li>• Development of Education in Pakistan</li> </ul> <p><b>For (D) Physics</b></p> <p><b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring</p> <p><b>Part-II (Master’s Level)</b></p> <ul style="list-style-type: none"> <li>• Heat and Thermodynamics,</li> <li>• Waves and Optics,</li> <li>• Electrostatic,</li> <li>• Electricity and Magnetism,</li> <li>• Atomic and Modern Physics,</li> <li>• Nuclear Physics,</li> <li>• Basic Solid State Physics,</li> <li>• Basic Electronics,</li> <li>• Electrodynamics,</li> <li>• Mechanics.</li> </ul> <p><b>Part-III</b></p> <ul style="list-style-type: none"> <li>• Teaching Techniques and Methodology</li> <li>• Classroom Management and Discipline</li> <li>• Testing and Evaluation</li> <li>• Development of Education in Pakistan</li> </ul>

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					<p><b>For (E) English</b>  <b>Part-I (Master's Level) (70 Marks)</b></p> <ul style="list-style-type: none"> <li>• English Literature 14th to 20th Century.</li> <li>• Vocabulary</li> <li>• Structuring of Sentences.</li> <li>• Linguistics.</li> <li>• English Language Teaching.</li> <li>• Grammar.</li> <li>• Syntax.</li> <li>• Diction.</li> </ul> <p><b>Part-II (30 Marks)</b></p> <ul style="list-style-type: none"> <li>• Teaching Techniques and Methodology</li> <li>• Classroom Management and Discipline</li> <li>• Testing and Evaluation</li> <li>• Development of Education in Pakistan</li> </ul> <p><b>For (F) Economics</b>  <b>Part-I</b>  Vocabulary, Grammar Usage, Sentence Structuring  <b>Part-II (Master's Level)</b></p> <ul style="list-style-type: none"> <li>• Micro Economics,</li> <li>• Macro Economics,</li> <li>• Managerial Economics,</li> <li>• International Economics,</li> <li>• Developmental Economics,</li> <li>• Statistics &amp; Econometrics,</li> <li>• WTO and Developing Economies,</li> <li>• Monetary Theory &amp; Public Finance,</li> </ul> <p><b>Part-III</b></p> <ul style="list-style-type: none"> <li>• Teaching Techniques and Methodology</li> <li>• Classroom Management and Discipline</li> <li>• Testing and Evaluation</li> <li>• Development of Education in Pakistan</li> </ul>
2.	135/2016	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. A minimum speed of 100/50 w.p.m in shorthand/typing respectively iii. Must be computer literate.	<ul style="list-style-type: none"> <li>• Typing Test with minimum Speed of 50 W.P.M</li> <li>• Shorthand Test with minimum Speed of 100 W.P.M</li> </ul>	<b>50 Marks</b> <b>50 Marks</b>

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3.	136/2016	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)  <b>Part-I</b> English = 20 marks  <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Grammar Usage, Sentence Structuring  <b>Part-II</b> <ul style="list-style-type: none"> <li>• General Textile Technology,</li> <li>• Spinning, Weaving,</li> <li>• Dyeing and Finishing,</li> <li>• Testing and Quality Control,</li> <li>• Fabric Design and Structure,</li> <li>• Business Management and Industrial Economics,</li> <li>• Industrial Management and Human Relations.</li> </ul>
4.	139/2016	Assistant Mechanical Engineer (BS-17), Mechanical Engineering Department of Pakistan Railways, (Railway Board) Ministry of Railways.	i. Bachelor's degree in Mechanical Engineering or equivalent qualification ii. Registration with PEC required.	Objective Type Test (MCQ)  <b>Part-I</b> English = 20 marks  <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring  <b>Part-II</b> <ul style="list-style-type: none"> <li>• Industrial Materials</li> <li>• Machine Design and Drawing</li> <li>• Mechanics of Machines</li> <li>• Production Management &amp; Quality Control</li> <li>• Workshop Technology</li> <li>• Hydraulic Machines</li> <li>• Mechanics and Strength of Materials</li> <li>• Manufacturing Processes like Casting, Forging, Machining, Rolling, Extrusion, Welding, Drilling etc.</li> </ul>
5.	144/2016	Psychologist (BS-17), (Railway Board) Ministry of Railways	Master's degree in Applied Psychology and two years post qualification clinical experience.	Objective Type Test (MCQ)  <b>Part-I</b> English = 20 marks  <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring  <b>Part-II</b> <ul style="list-style-type: none"> <li>• Nature and Scope of Psychology</li> <li>• Biological Basis of Behaviour</li> <li>• Sensation and Perception</li> <li>• Learning and Memory</li> <li>• Motivation and Emotion</li> <li>• Personality</li> <li>• Intelligence</li> <li>• Social Influence and Group Dynamics</li> <li>• Developmental Psychology</li> <li>• Abnormal and Clinical Psychology</li> <li>• Organizational/Industrial Psychology</li> </ul>

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Topics of Syllabi
6.	145/2016	<p>Trained Graduate Teacher (Male) (BS-16),</p> <p>A) Mathematics A &amp; B and Physics</p> <p>B) Chemistry, Botany and Zoology</p> <p>C) Computer Science with Math &amp; Physics or Stat.</p> <p>F.G. English Medium Schools, Directorate of Federal Government Educational Institutions (CANTTS/GARRISONS) Ministry of Defence.</p>	<p>i. Second Class or Grade 'C' Bachelor's Degree in the relevant subject with second class or Grade 'C' B.Ed/ M.Ed. or equivalent qualification</p> <p>ii. Two years post qualification teaching experience in an educational institution.</p>	<p>Objective Type Test (MCQ)</p> <p><b>Part-I</b> English = 20 marks</p> <p><b>Part-II</b> Subject Test = 40 marks</p> <p><b>Part-III</b> Professional Test=40 marks</p>	<p><b>A) Mathematics A &amp; B and Physics</b></p> <p><b>Part-I</b> Grammar Usage, Sentence Structuring</p> <p><b>Part-II (Bachelor's Level)</b></p> <ul style="list-style-type: none"> <li>• Algebra</li> <li>• Mechanics</li> <li>• Matrices, Determinants and Linear Equations</li> <li>• Work and Energy</li> <li>• Angular Momentum</li> <li>• Gravitation</li> <li>• Waves, Sound and Light</li> <li>• Thermodynamics</li> </ul> <p><b>Part-III</b></p> <ul style="list-style-type: none"> <li>• Educational Psychology,</li> <li>• Class Room Management and Discipline,</li> <li>• Instructional Planning and Teaching Strategies,</li> <li>• Students Evaluation and Examination System,</li> <li>• Educational Guidance and Counselling.</li> </ul> <hr/> <p><b>B) Chemistry, Botany and Zoology</b></p> <p><b>Part-I</b> Grammar Usage, Sentence Structuring</p> <p><b>Part-II (Bachelor's Level)</b></p> <ul style="list-style-type: none"> <li>• Thermodynamics</li> <li>• Chemical Equilibrium</li> <li>• Atomic Structure &amp; Periodic Table</li> <li>• Chemical Bonding</li> <li>• Algae &amp; Fungi,</li> <li>• Bryophytes</li> <li>• Gymnosperms,</li> <li>• Angiosperms,</li> <li>• Plant Physiology,</li> <li>• Ecology</li> <li>• Viruses &amp; Algae</li> <li>• Bryophyte &amp; Protozoa</li> </ul> <p><b>Part-III</b></p> <ul style="list-style-type: none"> <li>• Educational Psychology,</li> <li>• Class Room Management and Discipline,</li> <li>• Instructional Planning and Teaching Strategies,</li> <li>• Students Evaluation and Examination System,</li> <li>• Educational Guidance and Counselling.</li> </ul>

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Topics of Syllabi
					<p><b>C) Computer Science with Math &amp; Physics or Stat.</b></p> <p><b>Part-I</b> Grammar Usage, Sentence Structuring</p> <p><b>Part-II (Bachelor's Level)</b></p> <ul style="list-style-type: none"> <li>• Computer Architecture,</li> <li>• Operating System concepts,</li> <li>• Windows XP, Windows 7&amp; 8,</li> <li>• System Analysis &amp; Design,</li> <li>• Software Engineering,</li> <li>• Artificial Intelligence,</li> <li>• Security and Ethical issues</li> <li>• Data Structures,</li> <li>• Algebra</li> <li>• Mechanics</li> <li>• Ordinary Differential Equations</li> <li>• Matrices, Determinants and Linear Equations</li> </ul> <p><b>Part-III</b></p> <ul style="list-style-type: none"> <li>• Educational Psychology,</li> <li>• Class Room Management and Discipline,</li> <li>• Instructional Planning and Teaching Strategies,</li> <li>• Students Evaluation and Examination System,</li> <li>• Educational Guidance and Counselling.</li> </ul>
7.	146/2015	Assistant Private Secretary (BS-16), Management Services Wing, Establishment Division	<p>i. Second Class or Grade "C": Bachelor's degree from a University recognized by HEC</p> <p>ii. A minimum speed of 100/50 W.P.M in shorthand/typing respectively</p> <p>iii. Must be computer literate.</p>	<ul style="list-style-type: none"> <li>• Typing Test with minimum Speed of 50 W.P.M</li> <li>• Shorthand Test with minimum Speed of 100 W.P.M</li> </ul>	<p><b>50 Marks</b></p> <p><b>50 Marks</b></p>
8.	150/2016	Assistant Signal & Telecommunication Engineer (BS-17), Signal & Telecom Engineering Deptt. of Pak Railways, (Railway Board) Ministry of Railways	Bachelor of Engineering Degree in Electrical/ Electronics/ Telecommunication	<p>Objective Type Test (MCQ)</p> <p><b>Part-I</b> English = 20 marks</p> <p><b>Part-II</b> Professional Test=80 marks</p>	<p><b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring</p> <p><b>Part-II</b></p> <ul style="list-style-type: none"> <li>• Electric current and Ohm's Law</li> <li>• Batteries</li> <li>• Electrostatics</li> <li>• Semiconductors</li> <li>• Transistors</li> <li>• Amplifiers</li> <li>• Diodes and Power Supplies</li> <li>• Telephony</li> <li>• Antenna and Wave Propagation</li> <li>• Microwaves</li> <li>• Radar Systems</li> <li>• Satellite Communication</li> </ul>

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9.	151/2016	Assistant Electrical Engineer (BS-17), Electrical Engineering Department of Pakistan Railways, (Railway Board) Ministry of Railways	Bachelor of Engineering Degree in Electrical/ Electronics	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>• Power Generation,</li> <li>• Power Transmission,</li> <li>• Power Distribution,</li> <li>• AC./DC. Machines,</li> <li>• Power and Digital Electronics,</li> <li>• Electronic Devices and Structure,</li> <li>• Electric Circuits,</li> <li>• Semiconductor Devices,</li> <li>• Operational Amplifiers,</li> <li>• Oscillator &amp; Circuit Theory,</li> <li>• Logic Design &amp; Switching Theory,</li> <li>• Rules and Instructions of Repairs of the Multilayer Printed Circuit Boards,</li> <li>• Use of Specialized Diagnostic Test Equipments,</li> <li>• Handling of Programmable ICS,</li> <li>• FPGAs &amp; PLCs,</li> <li>• RF Devices.</li> </ul>
10.	152/2016	Assistant Controller of Store/ Purchase (BS-17), Store/Purchase Department of Pakistan Railways, (Railway Board) Ministry of Railways	i) B.Sc. Engineering in Civil/ Electrical/ Electronics/ Telecommunication/ Mechanical Engineering ii) Registration with PEC required.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>• Basic Arithmetic</li> <li>• General Science</li> <li>• Basic knowledge of I.T</li> <li>• Procedures of Receipt and Issue of Stores</li> <li>• Stores procedures with relation to following topics:- <ul style="list-style-type: none"> <li>a. Stock Taking</li> <li>b. Care and preservation of Railway Equipments and Stores</li> <li>c. Ware House Management</li> </ul> </li> <li>• Public Procurement Rules, 2004</li> </ul>
11.	153/2016	Accountant (BS-16), Academy of Educational Planning and Management (AEPAM), Ministry of Federal Education and Professional Training	Second Class or Grade 'C' Master's Degree in Commerce/ Business Administration. <b>OR</b> Graduate with SAS/PIPFA (Public Sector) <b>OR</b> Professional-I Exam of Institute of Cost and Management Accountant of Pakistan (ICMAP)	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>• Accounting Principles &amp; Procedures,</li> <li>• Scrutiny of Record for Audit Purposes,</li> <li>• Journal, Ledger &amp; Cash Book,</li> <li>• Preparation of Annual Budget,</li> <li>• Adjustment &amp; Depreciation,</li> <li>• Financial Planning &amp; Cost Accounting,</li> <li>• Heads of Accounts, Re-appropriation of Funds and</li> </ul>

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			OR Foundation of Institute of Chartered Accountant of Pakistan (ICAP)		Supplementary Grant, <ul style="list-style-type: none"> <li>Settlement of Audit Objections</li> <li>Preparation of Pension Documents.</li> <li>Public Procurement Rules, 2004</li> <li>Basic IT Knowledge</li> </ul>
12.	155/2016	Research Officer (BS-17), Academy of Educational Planning and Management (AEPAM), Ministry of Federal Education and Professional Training	Second Class or Grade 'C' Master's Degree in Education/Educational Planning and Management or in Administrative Sciences with B.Ed./ M.Ed. from a recognized University	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>Trends and Issues in Education</li> <li>Trends and Issues in EPM</li> <li>Computer Applications in Education</li> <li>Educational Management &amp; Planning</li> <li>Economics &amp; Financing of Education</li> <li>Educational Research &amp; Statistics</li> <li>Report Writing</li> </ul>
13.	159/2016	National Savings Officer (BS-17), Central Directorate of National Savings, Finance Division	Second Class or Grade 'C' Master's Degree in Economics/ Statistics/ Commerce/ Accounting/ Finance/ Business Administration/ Public Administration/ Cost and Management Accountant/ Chartered Accountant/ Administrative Sciences/ Management Sciences or equivalent qualification from University recognized by HEC.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring <b>Part-II</b> <ul style="list-style-type: none"> <li>Functions of National Savings Organization</li> <li>Economics theories/Economics Development</li> <li>Management theories/concepts and quantitative Analysis</li> <li>Central Banking</li> <li>Public Finance</li> <li>Monetary Policy</li> <li>Basic Arithmetic and I.T. Knowledge</li> </ul>
14.	160/2016	Assistant Private Secretary (BS-16), Ministry of States and Frontier Regions	i. Second Class or Grade "C": Bachelor's degree from a University recognized by HEC ii. A minimum speed of 100/50 W.P.M in shorthand/typing respectively iii. Must be computer literate.	<ul style="list-style-type: none"> <li>Typing Test with minimum Speed of 50 W.P.M</li> <li>Shorthand Test with minimum Speed of 100 W.P.M</li> </ul>	<b>50 Marks</b> <b>50 Marks</b>
15.	162/2016	Assistant Private Secretary (BS-16), Naval Headquarters, Ministry of Defence	i. Second class or Grade "C": Bachelor's degree from a University recognized by HEC ii. A minimum speed of 100/50 W.P.M in shorthand/typing respectively	<ul style="list-style-type: none"> <li>Typing Test with minimum Speed of 50 W.P.M</li> <li>Shorthand Test with minimum Speed of 100 W.P.M</li> </ul>	<b>50 Marks</b> <b>50 Marks</b>



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			iii. Must be computer literate.		
16.	164/2016	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. A minimum speed of 100/50 W.P.M in shorthand/typing respectively iii. Must be computer literate.	<ul style="list-style-type: none"> <li>• Typing Test with minimum Speed of 50 W.P.M</li> <li>• Shorthand Test with minimum Speed of 100 W.P.M</li> </ul>	<b>50 Marks</b> <b>50 Marks</b>
17.	165/2016	Training Cum Safety Officer (BS-17), Central Inspectorate of Mines, Ministry of Petroleum and natural Resources	i. Bachelor's Degree in Mining Engineering from a University recognized by HEC ii. One years post qualification operational/practical experience in Mines/Oil Fields.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 Marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>• Introduction to Mining Engineering</li> <li>• Mineral Sector Organizations</li> <li>• Mine Surveying and Management</li> <li>• Mine Management</li> <li>• Mineral Exploration and Processing</li> <li>• Mineral Project Management</li> <li>• Mine Ventilation</li> <li>• Mineralogy and Petrology</li> <li>• Mineral Development in Pakistan</li> <li>• National Mineral Policy</li> </ul>
18.	167/2016	Charge Nurse (BS-16), Federal General Hospital, Chak Shehzad, Islamabad, Cabinet Division.	Bachelor's Degree in Nursing or equivalent recognized by the Pakistan Nursing Council with valid registration with PNC. <b>OR</b> Three years Diploma in General Nursing with one year diploma in Midwifery (For Female) with valid registration with PNC. <b>OR</b> Three years Diploma in General Nursing with one year diploma in Midwifery (For Male) with valid registration with PNC.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 Marks	<b>Part-I</b> Grammar Usage, Sentence Structuring <b>Part-II</b> <ul style="list-style-type: none"> <li>• Basic Medical Sciences</li> <li>• General Nursing</li> <li>• Ward Administration</li> <li>• Hospitality of the Patients</li> <li>• Care vs. Cure for Health Management</li> <li>• Developing Training &amp; Instructional Materials for Nursing Courses.</li> </ul>
19.	168/2016	Medical Officer (BS-17), Federal General Hospital, Chak Shehzad, Islamabad, Cabinet Division.	MBBS or equivalent qualifications recognized by PM&DC.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>• Core courses of <b>MBBS</b> Degree Program.</li> <li>• Health Policy of the Government and future plans for Health Services to Public</li> </ul>

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				<p><b>Part-II</b> Professional Test=80 marks</p>	<ul style="list-style-type: none"> <li>• Care vs Cure for Health Management</li> </ul>
20.	173/2016	Senior Auditor (BS-16), Pakistan Railway Accounts Department, Ministry of Railways	<p>i) Second Class or Grade 'C' Bachelor's Degree in Business Administration (Finance/ Accounting)/ Commerce from a University recognized by HEC.</p> <p>ii) Two years post qualification experience in relevant field.</p> <p style="text-align: center;"><b>OR</b></p> <p>i) Second Class or Grade 'C' Bachelor's Degree in Commerce from a University recognized by HEC.</p> <p>ii) ICMA/ACMA in addition to Bachelor's Degree</p> <p>iii) One year post qualification experience in relevant field.</p>	<p>Objective Type Test (MCQ)</p> <p><b>Part-I</b> English = 20 marks</p> <p><b>Part-II</b> Professional Test=80 Marks</p>	<p><b>Part-I</b> Grammar Usage, Sentence Structuring</p> <p><b>Part-II</b></p> <ul style="list-style-type: none"> <li>• Accounting Principles &amp; Procedures,</li> <li>• Scrutiny of Record for Audit Purposes,</li> <li>• Journal, Ledger &amp; Cash Book,</li> <li>• Preparation of Annual Budget,</li> <li>• Adjustment &amp; Depreciation,</li> <li>• Financial Planning &amp; Cost Accounting,</li> <li>• Heads of Accounts, Re-appropriation of Funds and Supplementary Grant,</li> <li>• Settlement of Audit Objections</li> <li>• Preparation of Pension Documents.</li> <li>• Public Procurement Rules, 2004</li> <li>• Basic IT Knowledge</li> </ul>

**Scheme and Syllabus for Written Examination (Descriptive)  
for All Posts in BS-20 advertised under Consolidated  
Advertisement No. 06/2016**

Case No.	F.4-147/2016-R
Particulars of post	Director General (BS-20), National Archives of Pakistan, Cabinet Division
Minimum Qualification & Experience:	<ul style="list-style-type: none"> <li>i. Second Class or Grade 'C' Master's degree in Chemistry/History/Political Science/Pakistan Studies from a recognized University.</li> <li>ii. Two publications in the field of Archives.</li> <li>iii. Seventeen (17) years post qualification experience in a post in BS-17 and above OR equivalent including twelve (12) years experience in the Archives Management.</li> </ul>

**PAPER: ENGLISH (100 MARKS)**

**English Essay:** Candidates will be required to write an Essay in English from three topics comprising approximately **2000 words**. Candidates are expected to reflect comprehensive and research based knowledge on a selected topic. Candidate's articulation, expression and technical treatment of the style of English Essay writing 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.

Case No.	F.4-156/2016-R
Particulars of post	Director (BS-20), Academy of Educational Planning and Management (AEPAM), Ministry of Federal Education and Professional Training
Minimum Qualification & Experience:	<ul style="list-style-type: none"> <li>i. Ph.D. in Education/Educational Planning and Management or in Administrative Sciences with B.Ed/M.Ed from a recognized University.</li> <li>ii. Thirteen (13) years post qualification experience in the fields relating to Educational Planning and Management and Policy Formulation.</li> <li>iii. Three (3) Research Publications in the fields relating to Educational Planning and Management and Policy Formulation.</li> </ul> <p style="text-align: center;"><b>OR</b></p> <ul style="list-style-type: none"> <li>i. M.Phil in Education/Educational Planning and Management or in Administrative Sciences with B.Ed/M.Ed from a recognized University.</li> <li>ii. Fifteen (15) years post qualification experience in the field of Educational Planning and Management and Policy Formulation.</li> <li>iii. Four (4) Research Publications in the relevant fields.</li> </ul> <p style="text-align: center;"><b>OR</b></p> <ul style="list-style-type: none"> <li>i. Master Degree in Education/Educational Planning and Management or in Administrative Sciences with B.Ed/M.Ed from a recognized University.</li> <li>ii. Seventeen (17) years post qualification experience in the field of Educational Planning and Management and Policy Formulation.</li> <li>iii. Three (3) Research Publications in the relevant fields.</li> </ul>

### **PAPER: ENGLISH (100 MARKS)**

**English Essay:** Candidates will be required to write an Essay in English from three topics comprising approximately **2000 words**. Candidates are expected to reflect comprehensive and research based knowledge on a selected topic. Candidate's articulation, expression and technical treatment of the style of English Essay writing 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.

Case No.	F.4-157/2016-R
Particulars of post	Plant Protection Advisor and Director General (BS-20), Department of Plant Protection, Karachi, Ministry of National Food Security and Research.
Minimum Qualification & Experience:	<ul style="list-style-type: none"> <li>i. Second Class or Grade 'C' Master's degree in Agricultural Science with specialization in Entomology or M.Sc. Entomology.</li> <li>ii. <u>Research</u>: Evidence of original research extending over a period of fifteen (15) years, with publication in any foreign journal of repute.</li> </ul>

### **PAPER: ENGLISH (100 MARKS)**

**English Essay:** Candidates will be required to write an Essay in English from three topics comprising approximately **2000 words**. Candidates are expected to reflect comprehensive and research based knowledge on a selected topic. Candidate's articulation, expression and technical treatment of the style of English Essay writing 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. 06/2016**

**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 précis writing and suggesting an appropriate title.  
**Reading Comprehension (10 marks)**  
A selected passage, 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.4-123/2016-R
Particulars of post	Chief Documentation Officer (BS-19), Academy of Educational Planning and Management (AEPAM), Ministry of Federal Education and Professional Training
Minimum Qualification & Experience:	i. Ph. D in Library Sciences with 08 years post qualification experience in the relevant field. <b>OR</b> M. Phil in Library Sciences with 10 years post qualification experience in the relevant field <b>OR</b> Second Class or Grade 'C' Master's degree in Library Science with 12 years post qualification experience in the relevant field

**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: (Library/Information Science) 50 Marks****I. Use of Emerging Technologies in Library**

Information and other Library Technologies. Hardware. Software. Operating System. Telecommunications and Networks. Internet and the www, Barcode Technology, Wireless Technology and Virtual Private Network (VPN). Social Networking. Email. Word Processing. Spreadsheets. Presentation Software. Desktop Publishing. Databases. Library Security Systems. Tele-lifts. Digitization Hardware and Software. Reprographic Technology.

## ii. Organization of Information

Systems for Organization of Information: Environments, Storage and Retrieval Tools, Encoding Standards, Cataloguing Codes, Current Systems. The Information Organization Process: Surrogate/ Metadata Records: Description, Access; Authority Control. Subject Access: Analysis, Verbal Subject Approaches, Classification. Organization and Administration: Arrangement, Management Issues. Problems of Information Organization in Pakistan.

## iii. Basic Reference Sources

Definition. Evaluation Criteria. Bibliographies-- General Bibliographies, Basic Guides To Reference Materials, Library Catalogues; Serials Guides; Indexes and Abstracts; HEC NDL; Dictionaries and Thesauri; Almanacs And Fact Books; Encyclopaedias; Directories; Biographical Sources; Geographical Sources-- Maps, Atlases & Gazetteers; Reference Websites.

## iv. Management of Library and Information Services

Basic Theories and Principles of Administration for Effective Management of Public, Academic, and Special Libraries and Information Centres with emphasis on Planning, Organizing, Staffing, Directing, Coordinating, Reporting, and Budgeting. Administrative Aspects of Public and Technical Services, Facilities, Rules and Regulations, Evaluation, Public Relations, Inter-Agency Cooperation, and Change Management. Library Space Management.

### 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.	Governance	Anne Mette Kjær
6.	The Electronic Library.	Rowley, J. (2001).
7.	Role of ICTs in Library and Information Science	A. Kaliammal & G. Thamaraiselvi
8.	Discovering computers 2007: A gateway to information.	Shelly, G. B., Cashman, T. J., & Vermaat, M. (2007).
9.	Guide to selecting and cataloging quality WWW resources for the small library.	Coleman, A. (2004).
10.	Jadid Catalogue Sazi	Khurshid, Anis (1993)
11.	Reference and information services: An introduction.	Bopp, R. E., & Smith, L. C. (2001).
12.	Introduction to reference work: Vol. 1,	Katz, W. A. (2002).
13.	Management basics for information professionals.	Evans, G. E., Layzell Ward, P., Rugaas, B., & Evans, G. E. (2007).
14.	The practical library manager.	Massis, B. E. (2003).



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

Case No.	F.4-137/2016-R
Particulars of post	Neonatologist (BS-18), Federal Government Polyclinic, Capital Administration and Development Division.
Minimum Qualification & Experience:	<ul style="list-style-type: none"> <li>i. MBBS or equivalent qualification recognized by the PMDC.</li> <li>ii. Postgraduate higher diploma in the requisite specialty with three (3) years post qualification clinical experience in the speciality OR Postgraduate lower diploma with five (5) years post qualification clinical experience in the speciality.</li> <li>iii. Postgraduate training in the field of Neonatology with at least one (1) year post qualification experience in a Neonatology unit not less than 20 basinates.</li> </ul>

**Part-I: (Qualification Based)****50 Marks**Core courses of **MBBS Degree****Part-II: (Professional)****50 Marks**Core courses of Post Graduate Lower Diploma in **Paediatrics**.

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

Case No.	F.4-138/2016-R
Particulars of post	Assistant Professor Commerce, Male (BS-18), Islamabad Model Colleges, Capital Administration & Development Division
Minimum Qualification & Experience:	Ph.D. Degree in Commerce with one year (1) post qualification teaching experience at College/ University level. <b>OR</b> M. Phil Degree in Commerce with three (3) years post qualification teaching experience at College/ University level. <b>OR</b> Second Class or Grade 'C' Master's Degree in Commerce with five (5) year post qualification teaching experience at College/ University level.

**Part-I: (Commerce)****50 Marks**

- I. **Introduction to Business Finance:** Nature and Scope of a Business Entity, Contemporary Challenges posed to a Business, Common Legal Forms of a Business Entity, Meaning, Nature and Scope of Finance and Financial Management, Common Modes (Types) of Business Finance – Short- Medium- and Long-term Financing, Nature and Scope of Financial Markets and Institutions, Features and Classification of Financial Markets, Financial Management Techniques for Decision-making.
- II. **Auditing:** Nature and Purpose of Auditing, Audit Planning and Control, Audit Procedures and Techniques, Audit Evidence and Documentation, Completion of an Audit, Performance of Audit, The Reporting of Audit, Internal Audit.
- III. **Role and Responsibilities of an Auditor:** Auditor's professional and legal Rights, Responsibilities & Duties, and Liabilities, Auditor's Opinion and Report and their classification (Types), as specified under the Companies Ordinance 1984 and in the handbook of IFAC.
- IV. **Fundamental Accounting Principles, Concepts, Assumptions and Conventions:** Nature and Scope of Accounting, Accrual/Matching Concept, Consistency of Presentation and Comparability, True and Fair View, Neutrality, Materiality, Prudence, Completeness, Understandability and Usefulness, Going Concern, and Substance over Form.
- V. **Cost Accounting:** Concepts and Scope of Cost Accounting, Cost Classification and Flows, Material Costing and Control, Labour Costing and Control, Factory Overhead Costing and Control, Types of Costing Systems
- VI. **Managerial Economics:** The Nature and Scope of Managerial Economics, Optimization Techniques and new Management Tools, Demand Theory, Demand Estimation, Demand Forecasting, Production and Cost Analysis, Cost Theory and Estimation, Linear Programming, Risk Analysis
- VII. **Financial Management:** Elements of Financial Administration, Performance and Programmed Budgeting, Capital Budget, Principles of Budgeting, Auditing and Accounting.

**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 Communication
- 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.	Fundamentals of Accounting Principles	Wild. Larson. Chiappetta
2.	Principles of Accounting, and Advanced Accounting	Sohail Afzal
3.	Cost Accounting	Nisar ur Din.
4.	Advanced Auditing	Prof. Dr. Khuaja Amjad Saeed
5.	Managerial Economics	Micheal Baye
6.	Research in Education	JW Best
7.	Integrating Education Technology into Teaching	Roblyer
8.	Curriculum Development	S. M. Shahid
9.	Educational Measurement and Evaluation	S. M. Shahid
10.	Educational Administration	S. M. Shahid

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

Case No.	F.4-140/2016-R
Particulars of post	Editor (BS-18), GHQ, Ministry of Defence
Minimum Qualification & Experience:	i) Second Class or Grade 'C' Master's Degree in Journalism/ Urdu/ Mass Communication/ Public Relations ii) Five years post qualification experience in a News Agency or Newspaper of repute. iii) Ability to write and contribute articles in English and Urdu.

**A: Translation (40 Marks)**

- Urdu to English Translation of 2 paragraphs out of 3 literary scripts (20 marks)
- English to Urdu Translation of 2 paragraphs out of 3 literary scripts (20 marks)

**B: Editing of Literature (40 Marks)**

- Editing of any two Scripts out of three in English (20 marks each)

**C: Computer Literacy (20 Marks)**

- Microsoft Word (Typing and Formatting) (10 marks)
- Microsoft PowerPoint (Typing, Formatting and Inserting Objects) (10 marks)

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

Case No.	F.4-141/2016-R
Particulars of post	Associate Surgeon/ Physician (BS-18), (A) Associate Surgeon Neuro Surgery, (B) Associate Surgeon Ophthalmology, (C) Associate Surgeon Urology, (D) Associate Physician Psychiatry, (E) Pathologist, (F) Radiologist (G) Anaesthetist. Federal Government Polyclinic, Capital Administration and Development Division
Minimum Qualification & Experience:	i. MBBS or equivalent qualification recognized by Pakistan Medical and Dental Council. ii. Postgraduate higher diploma in the requisite speciality with 3 years post qualification clinical experience in the speciality <b>OR</b> Postgraduate lower diploma with 5 years post qualification clinical experience in the speciality.

**(A) Associate Surgeon Neuro Surgery,****Part-I: (Qualification Based) 50 Marks**Core courses of **MBBS Degree****Part-II: (Professional) 50 Marks**Core courses of Post Graduate Lower Diploma in **Neuro Surgery****(B) Associate Surgeon Ophthalmology****Part-I: (Qualification Based) 50 Marks**Core courses of **MBBS Degree****Part-II: (Professional) 50 Marks**Core courses of Post Graduate Lower Diploma in **Ophthalmology****(C) Associate Surgeon Urology****Part-I: (Qualification Based) 50 Marks**Core courses of **MBBS Degree****Part-II: (Professional) 50 Marks**Core courses of Post Graduate Lower Diploma in **Urological Diseases.**

**(D) Associate Physician Psychiatry**

**Part-I: (Qualification Based) 50 Marks**

Core courses of MBBS Degree

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

Core courses of Post Graduate Lower Diploma in **Psychiatry**

**(E) Pathologist**

**Part-I: (Qualification Based) 50 Marks**

Core courses of MBBS Degree

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

Core courses of Post Graduate Lower Diploma in **Pathology**

**(F) Radiologist**

**Part-I: (Qualification Based) 50 Marks**

Core courses of MBBS Degree

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

Core courses of Post Graduate Lower Diploma in **Radiology**

**(G) Anaesthetist**

**Part-I: (Qualification Based) 50 Marks**

Core courses of MBBS Degree

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

Core courses of Post Graduate Lower Diploma in **Anaesthesia**

**PAPER-II: PROFESSIONAL**

Max Marks: 100

Time Allowed: 3 Hours

Case No.	F.4-142/2016-R
Particulars of post	Associate Professor, Islamic Studies (Female) (BS-19), F.G. Colleges, Directorate of Federal Government Educational Institutions (Cantts/ Garrisons), Ministry of Defence
Minimum Qualification & Experience:	Ph.D. Degree in Islamic Studies with eight (8) years post qualification teaching and administrative experience at College/ University level. <b>OR</b> M. Phil Degree in Islamic Studies with ten (10) years post qualification teaching and administrative experience at College/ University level. <b>OR</b> Second Class or Grade 'C' Master's Degree in Islamic Studies with twelve (12) years post qualification teaching and administrative experience at College/ University level.

**Part-I: (Islamic Studies)****50 Marks****I. Islam: the Code of Life**

- Salient features of Islamic;
  - Social System
  - Political System
  - Economic System
  - Judicial System
  - Administrative System
- Responsibilities of Civil Servants

**II. Study of Seerah**

Need and importance of the study of Seerah Prophet Mohammad (PBAH) as:

- The Role Model
- Merciful for the universe.
- Preacher
- Diplomat
- Teacher and Educationist
- Revolutionary Leader

**III. Islamic Civilization and Culture:**

- Meanings and the vital elements of Islamic Civilization and Culture
- Role of civilisation in the development of the human personality and communities
- Distinctions of Islamic Civilization;
  - Tauheed
  - Risalat
  - Spiritualism
  - Dignity of Man
  - Equality
  - Social Justice
  - Moral values
  - Tolerance
  - Rule of Law

**IV. Islam and World**

- Impact of Islamic Civilization on the West and vice-versa.
- Muslim World and the Contemporary Challenges
- Interaction between East and West.
- Role of Islam in the modern world.

## 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 Communication
- 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.	Islam: its meaning and Message	Khurshid Ahmad
2.	Islam: The Misunderstood Religion	Muhammad Qutub
3.	Towards Understanding Islam	Abul Aala Moudoodi
4.	Ideals and Realities of Islam	Hussain Nasr,
5.	A brief Survey of Muslim Science and Culture	Muhammad Abdur –Rahman
6.	Quranic Sciences	Afzalur Rahman
7.	Research in Education	JW Best
8.	Integrating Education Technology into Teaching	Roblyer
9.	Curriculum Development	S.M. Shahid
10.	Educational Measurement and Evaluation	S.M. Shahid
11.	Educational Administration	S.M. Shahid



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

Case No.	F.4-143/2016-R
Particulars of post	Assistant Professor (Male) (Political Science) (BS-18) F.G. Colleges, Directorate of Federal Government Educational Institutions (Cantts/ Garrisons), Ministry of Defence
Minimum Qualification & Experience:	Ph.D. Degree in Political Science with one year (1) post qualification teaching experience at College/ University level. <b>OR</b> M. Phil Degree in Political Science with three (3) years post qualification teaching experience at College/ University level. <b>OR</b> Second Class or Grade 'C' Master's Degree in Political Science with five (5) years post qualification teaching experience at College/ University level.

**Part-I: (Political Science)****50 Marks****I. Political Concept (Western and Islamic):**

Sovereignty, Justice, Law, Liberty, Freedom, Equality, Rights and Duties, Human Rights, Political authority and Power.

**II. Comparative Politics:**

Political Socialization, Political Culture, Political Development, Political Recruitment, Social Change, Civil Society, Violence and Terrorism in Politics, Gender and Politics, Women Empowerment.

**III. Political Participation:**

Political Change and Revolution, Elections, Electoral System, Public Opinion, Propaganda, Political Parties, Pressure Groups and Lobbies.

**IV. Political Institutions and Role of Government:**

Legislature, Executive, Judiciary, Political Elites, Civil-Military and Bureaucracy.

**V. Forms of Government:**

Monarchy, Democratic, Dictatorship, Totalitarian/Authoritarian, Unitary, Federal, Confederation, Presidential and Parliamentary

**VI. Government and Politics in Pakistan:**

Constitution making from 1947 -1956, A comparative and critical analysis of 1956, 1962, 1973 Constitutions of Pakistan, Constitutional Amendments up-to-date, Federal structure in Pakistan, and Central-Provincial relations after 18<sup>th</sup> amendment in the Constitution.

Political Culture of Pakistan, Political developments and the Role of civil and military Bureaucracy, Judiciary, Feudalism, Dynastic Politics, Political Parties and Interest Groups, Elections and Voting Behavior, Religion and Politics, Ethnicity and National Integration.

**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 Communication
- 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**

<b>S. No.</b>	<b>Title</b>	<b>Author</b>
1.	Political Thought in Medieval Islam	Erwin I.J. Rosenthal
2.	Modern Islamic Political Thought	Hamid Enayat,
3.	International Politics: A Framework for Analysis	Holsti, K.J.
4.	21 <sup>st</sup> Century Political Science: A Reference Handbook	John T.Ishiyama, Marijke Breuning,
5.	Political Thought from Plato to Present	Judd Herman,
6.	Government and Politics in Pakistan	Mushtaq Ahmad
7.	Islami Riyasat	Syed Abul Aala Maudoodi
8.	Contemporary Political Philosophy: An Introduction	Will Kymlicka
9.	Research in Education	JW Best
10.	Integrating Education Technology into Teaching	Roblyer
11.	Curriculum Development	S. M. Shahid
12.	Educational Measurement and Evaluation	S. M. Shahid
13.	Educational Administration	S. M. Shahid

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

Case No.	F.4-148/2016-R
Particulars of post	Legislative Translation Officer (BS-18), Ministry of Law, Justice and Human Rights.
Minimum Qualification & Experience:	i. Bachelor's Degree in Law and Urdu as an elective subject at Bachelor level from a University/ College recognized by the HEC. ii. 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

**SUGGESTED READINGS**

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

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

Case No.	F.4-149/2016-R
Particulars of post	Assistant Draftsman (BS-18), Law and Justice Division, Ministry of Law, Justice and Human Rights
Minimum Qualification & Experience:	i. Second Class or Grade 'C' Bachelor's Degree in Law or Equivalent qualification recognized by HEC ii. 05 years post qualification experience of work in drafting statutes and statutory rules, notifications, legislations and other legal instruments and vetting of legal documents

**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**

<b>S. No.</b>	<b>Title</b>	<b>Author</b>
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.4-154/2016-R
Particulars of post	Deputy Director (Academics) (BS-18), Academy of Educational Planning and Management (AEPAM), Ministry of Federal Education and Professional Training
Minimum Qualification & Experience:	<p>i. Ph. D in Education/ Educational Planning and Management or in Administrative Sciences with B.Ed./M.Ed. from a recognized University.</p> <p>ii. 01 year post qualification experience in Educational Planning and Management.</p> <p style="text-align: center;"><b>OR</b></p> <p>i. M. Phil in Education/ Educational Planning and Management or in Administrative Sciences with B.Ed./M.Ed. from a recognized University.</p> <p>ii. Three (03) years post qualification experience in the field of Educational Planning and Management.</p> <p style="text-align: center;"><b>OR</b></p> <p>i. Second Class or Grade 'C' Master's degree in Education/ Educational Planning and Management or in Administrative Sciences with B.Ed./M.Ed. from a recognized University.</p> <p>ii. Five (05) years post qualification experience in the field of Educational Planning and Management.</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: (Education) 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 Communication
- 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. 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.	Research in Education	JW Best
7.	Integrating Education Technology into Teaching	Roblyer
8.	Curriculum Development	S. M. Shahid
9.	Educational Measurement and Evaluation	S. M. Shahid
10.	Educational Administration	S. M. Shahid

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

Case No.	F.4-158/2016-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"> <li>i. Bachelor's Degree in Mechanical or Electrical Engineering.</li> <li>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.</li> <li>iii. Knowledge of Labour Laws/ Dock Labourers Act and the Pakistan Dock Labourers Regulations.</li> </ul>

**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	Kalpajjian
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.4-161/2016-R
Particulars of post	Assistant Engineering Adviser (Civil)/ Senior Engineer (Floods)/ Deputy Director (Supervision & Monitoring) (BS-18), Office of the Chief Engineering Adviser/ Chairman Federal Flood Commission, Ministry of Water and Power
Minimum Qualification & Experience:	<p>i. Bachelor's Degree in Civil Engineering or an equivalent qualification from a recognized University/ Institution.</p> <p>ii. Five years post qualification experience in Planning, Design or construction or operation of Dams, Irrigation System or Hydraulic Works including use of construction equipment in BS-16 and above or equivalent in a Government/ Semi-Government/ reputable private organization.</p>

**I. Civil Engineering Fundamentals:**

Structures; stress, strain, shearing force and bending moment concepts, beams, columns, footing. Simply supported and Cantilever beams, Pulleys and gears.

**II. Transportation Engineering:**

Introduction, highway administration, scheme preparation, traffic appraisal, environmental appraisal, highway geometry, drainage, lighting, signing, communications and safety, roads and traffic in urban areas, highway maintenance, low cost roads in developing countries.

**III. Environmental Engineering:**

Environmental impacts on water resources projects, transportation engineering projects, waste water treatment and management, water supply and distribution.

**IV. Fundamentals of Hydraulic Engineering:**

Properties of fluid mechanics, pressure measuring devices, flow measuring devices, losses in pipelines, open channels, barrages and dams.

**V. Costing, Accounting and Budgeting:**

Net present value, Net future value, cash flows, auditing, income statement, balance sheet, taxation, financial risk management, cost analysis.

**VI. Project Management:**

Time lines, milestones, resources allocation, dependency, Gant Charts,

**VII. Inventory Management:**

FIFO models, LIFI models, Identification Schemes, Inventory management systems.

**VIII. Quality Management Systems:**

QA modles. Deming, Juran Crosby, Quality circles, management responsibility, quality planning, purchasing, design process and design validation, quality audit, corrective and preventive measures.

**SUGGESTED READINGS**

<b>S. No.</b>	<b>Title</b>	<b>Author</b>
1.	Properties of Concrete	A.M. Neville.
2.	Plain and reinforced concrete	Nilson.
3.	Strength of material	Andrew Pytel and Singer.
4.	Transportation Engineering, Planning and design	Paul Wright.
5.	Civil Engineer's Reference Book	LS Blake
6.	Surveying and Levelling	T.P Kanetaker.
7.	Public Health Engineering	STEEL.
8.	Fluid mechanics with engineering applications	Finnemore/ Franzini.
9.	Handbook of Engineering Management	Dennis Lock.
10.	Total Quality Management	Dale H. Besterfield, Carol Besterfield-Michna, Glen H. Besterfield, Mary Gesterfield-Sacre

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

Case No.	F.4-163/2016-R
Particulars of post	Headmistress (BS-18), F.G. Urdu Medium Female Schools, Directorate of Federal Government Educational Institutions (Cantts/ Garrisons), Ministry Of Defence.
Minimum Qualification & Experience:	i. Second Class or Grade 'C' Master's Degree. ii. M. Ed/ Second Class B.Ed. iii. Five (5) years 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**

<b>S. No.</b>	<b>Title</b>	<b>Author</b>
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.4-170/2016-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"> <li>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.</li> <li>ii. Five (5) years post qualification research experience in the field of Geology.</li> <li>iii. Must have published at least three (3) research papers in the fields of Geology.</li> </ul>

**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.4-171/2016-R
Particulars of post	Assistant Professor Statistics (Male) (BS-18), Federal Government Educational Institutions (Cantts/Garrisons), M/O Defence
Minimum Qualification & Experience:	Ph.D. Degree in Statistics with one (1) year post qualification teaching experience at College/ University level <b>OR</b> M. Phil Degree in Statistics with three (3) years post qualification teaching experience at College/ University level <b>OR</b> 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**

Estimation: Point Estimation, Properties of a good Estimator. Interval Estimation. Interval Estimation of Population mean. Large and small sample confidence intervals for Population Mean.

Hypothesis Testing: Types of errors. Hypothesis Testing for Population Mean. Inferences for Two Population Means. Inferences for the Mean of Two Normal Populations using Independent Samples (variances are assumed Equal). Inference for Two Populations Mean using Paired Samples. Inferences for Population Proportions. Confidence Intervals and hypothesis Testing for Population Proportion. Inferences for Two Populations Proportions using Independent Samples, Estimation of sample size

Analysis of categorized data. Goodness of fit tests. Contingency tables. Test of independence in contingency tables.

**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**

<b>S. No.</b>	<b>Title</b>	<b>Author</b>
1.	Principles and Procedures of Statistics	Steel, R and Torrie, J.H.
2.	Introduction to Statistical Theory, Part-I & II	Chaudhry, S.M. and Kamal, S.
3.	Introduction to Probability Theory and Statistical Inference, 3rd Edition.	Larson, H.J.
4.	Fundamentals of Modern Statistical Methods	Wilcox, R.
5.	Statistical Methods	Aggarwal, Y.P.
6.	Research in Education	JW Best
7.	Integrating Education Technology into Teaching	Roblyer
8.	Curriculum Development	S. M. Shahid
9.	Educational Measurement and Evaluation	S. M. Shahid
10.	Educational Administration	S. M. Shahid