

**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. 02/2019**

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Topics of Syllabi
1.	02/2019	<b>Junior Scientific Officer</b> (BS-16), Armed Forces Institute of Pathology, GHQ Medical Directorate, Ministry of Defence.	Second Class or Grade 'C' M.Sc. Degree in Chemistry/ Biochemistry/ Microbiology or equivalent qualification from a university recognized by the Higher Education Commission.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> General Science Test=80 marks	<b>Part-I</b> Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>• Thermodynamics,</li> <li>• Nature, Properties and States of Matter,</li> <li>• Gases, Liquids &amp; Solids,</li> <li>• Organic Chemistry</li> <li>• In-Organic Chemistry</li> <li>• Biochemistry</li> <li>• Human Physiology</li> <li>• Immunology</li> <li>• Mycology</li> </ul>
2.	08/2019	<b>Junior Scientific Officer</b> (BS-17), Pakistan Navy, Ministry of Defence.	Bachelor's Degree in Engineering in Electronics/ Chemical/ Electrical. OR i. Second Class or Grade 'C' Master's Degree in Physics/ Chemistry/Textile Chemistry/ Metallurgy. ii. In case of Metallurgy knowledge of Ferrous and Non Ferrous materials and modern special technique. iii. In case of Textile Chemistry two (2) years post qualification experience in Textile Chemistry.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> General Science Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>• Matter and its Properties</li> <li>• Atomic Structure</li> <li>• Compounds and Bonding</li> <li>• Chemical Reactions</li> <li>• Aqueous Solutions</li> <li>• Acids and Bases</li> <li>• Phases of Matter</li> <li>• Organic Molecules</li> <li>• Organic Products (Polymers, Oil, Soaps, Paints, Varnishes and Detergents)</li> <li>• Radioactivity and its Applications</li> <li>• Ferrous and Non Ferrous marterials</li> <li>• Instrumentation (UV/Visible, FTIR, GC, HPLC, XRF, XRD, Pollution (Water and Air))</li> </ul>

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Topics of Syllabi
3.	20/2019	<b>Scientific Officer</b> (BS-17), National Veterinary Laboratory, Ministry of National Food Security and Research	Second Class or Grade C Master's Degree in Pharmacology/ Parasitology/ Bacteriology/ Microbiology/ Biochemistry/ Epidemiology. <b>OR</b> Second Class or Grade C Bachelor's Degree in Animal Husbandry/ Veterinary Sciences/ DVM. <b>OR</b> B. Pharmacy.	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>Animal Breeding Plans &amp; Policies in Pakistan</li> <li>Animal Feed Resources</li> <li>Histology &amp; Embryology</li> <li>Pharmacology &amp; Toxicology</li> <li>Livestock Economics &amp; Business Management</li> <li>Principles of Animals Nutrition</li> <li>Systematic Virology, Histology &amp; Pathology</li> <li>Veterinary Entomology, Epidemiology &amp; Public Health</li> </ul>
4.	28/2019	<b>Programmer</b> (BS-17) Pakistan Meteorologist Department, Cabinet Secretariat (Aviation Division)	Second Class or Grade 'C' Master's Degree in Computer Science/Information Technology or equivalent qualification from a university recognized by HEC. <b>OR</b> Second Class or Grade 'C' Bachelor's Degree in Computer Science/BIT (4 years duration) or equivalent from a university recognized by HEC.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>Fundamental Programming,</li> <li>Data types,</li> <li>Program Logic,</li> <li>Development of Basic Algorithms,</li> <li>Computer Networks and Internet,</li> <li>Designing Solution &amp; Testing,</li> <li>Visual Basic, C++, Java, Unix/Red Hat Linux Operating System,</li> <li>Multiple Browsers,</li> <li>Search Engine Optimization,</li> <li>Web Development</li> </ul>
5.	34/2019	<b>Medical Officer (Female)</b> (BS-17 plus 25% special pay), Health Department, Gilgit Baltistan, Ministry of Kashmir Affairs and Gilgit Baltistan.	MBBS or equivalent qualification from a recognized University/ College by PMDC.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring. <b>Part-II</b> <ul style="list-style-type: none"> <li>Core courses of <b>MBBS</b> Degree Program.</li> <li>Health Policies of the Government of Pakistan.</li> <li>Care vs Cure for Health Management.</li> <li>Major Challenges being faced by the Health Sector.</li> </ul>

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Topics of Syllabi
6.	38/2019	<b>Research Officer</b> (BS-17), Industries & Commerce Section, Ministry of Planning, Development and Reform.	Second Class or Grade 'C' Master's Degree or equivalent qualifications in any of the following subjects: Economics (with Industrial Economics), Agricultural Economics, Physics, Chemistry, Mathematics, Mineral Science, Geology, Business Administration, Commerce and Accounting. <b>OR</b> Second Class or Grade 'C' Bachelor's Degree or equivalent qualifications in Production/ Mechanical/ Chemical/ Textile/ Electrical/ Mining Engineering.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring, <b>Part-II</b> <ul style="list-style-type: none"> <li>Project Management and Evaluation tools</li> <li>Project Evaluation,</li> <li>Research Methodologies,</li> <li>Economic Development of Pakistan with special focus on Industrial and Agricultural Sectors.</li> <li>Organization of Economic Research,</li> <li>Collection and Compilation of Data,</li> <li>Methods of Data Analysis,</li> </ul>
7.	41/2019	<b>Assistant Private Secretary</b> (BS-16), Federal Investigation Agency, Ministry of Interior	i. Second Class or Grade 'C' Bachelor's degree from a University recognized by HEC. ii. Minimum shorthand speed: 100 w.p.m. and typing speed: 50 w.p.m. iii. Must be computer literate. <b>Note:</b> Computer literacy means proficiency in M.S Office (M.S Word, Power Point & Excel).	<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> <li>Computer Literacy Test: <ul style="list-style-type: none"> <li>i Microsoft Word (Typing, Formatting)</li> <li>ii Microsoft Excel (Typing, Graph, Calculations)</li> <li>iii Microsoft Power Point (Typing, Formatting, Inserting Objects)</li> </ul> </li> </ul>	<b>35 Marks</b> <b>35 Marks</b> <b>10 Marks</b> <b>10 Marks</b> <b>10 Marks</b>
8.	42/2019	<b>Medical Officer</b> (BS-17), Pakistan Post Office Department, Ministry of Postal Services	i. MBBS Degree. ii. Registration with PMDC 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>Core courses of <b>MBBS</b> Degree Program.</li> <li>Health Policies of the Government of Pakistan.</li> <li>Care vs Cure for Health Management.</li> <li>Major Challenges being faced by the Health Sector.</li> </ul>

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Topics of Syllabi
9.	44/2019	<b>Inspector (Tech) (BS-16)</b> , Intelligence Bureau.	i. B. Tech. in Electronics or equivalent in relevant subject from Government recognized Institute/ University. ii. Two (2) years post qualification practical experience in the field of Electronics. <b>OR</b> Retired JCOs/Retired Foreman of Corps of Signals with ten (10) years experience in the related field.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> General Intelligence=80 marks <b>Subjective Test</b> <b>Technical Proficiency Test</b> =100 marks Qualifying Standard= 50%	<b>Part-I</b> Grammar Usage, Sentence Structuring <b>Part-II</b> <ul style="list-style-type: none"> <li>• Basic Arithmetic.</li> <li>• Current Affairs.</li> <li>• Pakistan Affairs &amp; Islamic Studies</li> <li>• Everyday/General Science</li> <li>• Basic Computer Operation in MS Office</li> </ul> <b>Note : (Equal weightage for each topic at Part-II)</b> <b>For Pre-selected candidates</b> <ul style="list-style-type: none"> <li>• Electrical and Electronic circuits, their application and troubleshooting</li> <li>• Working and troubleshooting of RF Communication System</li> <li>• Working of CCTV Systems, Remote Control System and audio/video recording gadgets</li> </ul>
10.	47/2019	<b>Assistant Private Secretary (BS-16)</b> , Intelligence Bureau	i. Second Class or Grade 'C' Bachelor's degree from a University recognized by HEC. ii. Minimum shorthand speed: 100 w.p.m. and typing speed: 50 w.p.m. iii. Must be computer literate. <b>Note:</b> Computer literacy means proficiency in M.S Office (M.S Word, Power Point & Excel).	<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> <li>• Computer Literacy Test:               <ul style="list-style-type: none"> <li>i Microsoft Word (Typing, Formatting)</li> <li>ii Microsoft Excel (Typing, Graph, Calculations)</li> <li>iii Microsoft Power Point (Typing, Formatting, Inserting Objects)</li> </ul> </li> </ul>	<b>35 Marks</b> <b>35 Marks</b> <b>10 Marks</b> <b>10 Marks</b> <b>10 Marks</b>
11.	48/2019	<b>Assistant Director (BS-17)</b> Intelligence Bureau.	Second Class or Grade 'C' Master's Degree or equivalent.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> General Intelligence 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>• Current Affairs.</li> <li>• Pakistan Affairs &amp; Islamic Studies</li> <li>• Everyday/General Science</li> </ul> <b>Note : (Equal weightage for each topic at Part-II)</b>

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Topics of Syllabi
12.	52/2019	<b>Research Officer</b> (Power) (BS-17), Energy Wing, Planning and Development Division	Bachelor's Degree of Engineering or equivalent qualifications in Electrical (Power)	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring, <b>Part-II</b> <ul style="list-style-type: none"> <li>Core courses of <b>B.E Electrical</b>,</li> <li>Planning, Policy formulation and analysis of power sector issues of Pakistan</li> <li>Collection and compilation of data,</li> <li>Methods of data analysis.</li> </ul>
13.	53/2019	<b>Demonstrator</b> (Male) (BS-16)	Second Class or Grade 'C' Master's Degree in Physics/ Chemistry/ Biology.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> General Science Test=80 marks	<b>Part-I</b> Grammar Usage, Sentence Structuring <b>Part-II</b> <ul style="list-style-type: none"> <li><b>Physics:</b> <ul style="list-style-type: none"> <li>Heat &amp; Thermodynamics,</li> <li>Electrostatics,</li> <li>Electromagnetism,</li> <li>Waves and Optics</li> </ul> </li> <li><b>Chemistry:</b> <ul style="list-style-type: none"> <li>Thermodynamics,</li> <li>Nature, Properties and States of Matter,</li> <li>Gases, Liquids &amp; Solids,</li> <li>Organic Chemistry.</li> </ul> </li> <li><b>Biology:</b> <ul style="list-style-type: none"> <li>Viruses &amp; Algae</li> <li>Bryophyte</li> <li>Protozoa</li> <li>Mollusca</li> </ul> </li> <li>Maintenance and Management of Science Laboratories.</li> </ul>
14.	54/2019	<b>Demonstrator</b> (Female) (BS-16), Directorate of Federal Government Educational Institution Cantts/Garrisons), Ministry of Defence.			
15.	55/2019	<b>Librarian</b> (Male) (BS-16), Federal Government Educational Institution (Cantts/ Garrisons), Ministry of Defence.	Second Class or Grade 'C' Bachelor's Degree with Diploma in Library Science. <b>OR</b> Bachelor of Library Science.	Objective Type Test (MCQ) <b>Part-I</b> English = 20 marks <b>Part-II</b> Professional Test=80 marks	<b>Part-I</b> Grammar Usage, Sentence Structuring <b>Part-II</b> <ul style="list-style-type: none"> <li>Information Sources and Services</li> <li>Cataloguing: Theory and Practice</li> <li>Procurement and Maintenance of Library Books</li> <li>Library Automation/Information Storage &amp; Retrieval</li> <li>Research Methods &amp; Techniques for Librarians</li> <li>Public Records, Rare Material &amp; their Conservation</li> <li>Management of Serials Publications</li> <li>Rules &amp; Procedure regarding Write Off the Library Losses</li> </ul>

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Topics of Syllabi
16.	58/2019	<b>Medical Officer (Male)</b> (BS-17 Plus 25% Special Pay), Health Department, Gilgit Baltistan, Ministry of Kashmir Affairs and Gilgit Baltistan.	MBBS or equivalent qualification from a recognized University/ College by PMDC.	Objective Type Test (MCQ) <b>Part-I</b> English =20 marks <b>Part-II</b> Professional Test =80 marks	<b>Part-I</b> Vocabulary, Grammar Usage, Sentence Structuring <b>Part-II</b> <ul style="list-style-type: none"> <li>Core courses of <b>MBBS</b> Degree Program.</li> <li>Health Policies of the Government of Pakistan.</li> <li>Care vs Cure for Health Management.</li> <li>Major Challenges being faced by the Health Sector.</li> </ul>
17.	59/2019	<b>Senior Auditor</b> (BS-16), Pakistan Military Accounts Department, Ministry of Defence	Second Class or Grade 'C' Bachelor's Degree in Business Administration (Finance/ Accounting)/ Commerce/ Economics/ Statistics/ Mathematics or equivalent from a University recognized by HEC.  <b>OR</b> ICMA Operational Level Certificate from ICMA after Graduation	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 Purpose,</li> <li>Journal, ledger &amp; Cash Book,</li> <li>Annual Budget,</li> <li>Adjustment &amp; Depreciation,</li> <li>Financial Planning &amp; Cost Accounting,</li> <li>Head of Accounts, Re-appropriation of Accounts and Supplementary Grant,</li> <li>Settlement of Audit Objections</li> <li>Preparation of Pension Documents.</li> <li>Public Procurement Rules, 2004</li> </ul>

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Topics of Syllabi
18.	61/2019	<b>Data Control Officer</b> (BS-16), Pakistan Military Accounts Department, Ministry of Defence	<p>Second Class or Grade 'C' Master's degree in Computer Science/Information Technology or equivalent from a University recognized by the Higher Education Commission.</p> <p><b>OR</b></p> <p>i. Second Class or Grade 'C' Bachelor's degree in Mathematics/ Statistics/ Physics or equivalent with one (1) year post graduate diploma in Computer Science from an Institute/ University recognized by the Higher Education Commission</p> <p><b>OR</b></p> <p>Second Class or Grade 'C' Bachelor's Degree in Computer Science/ Information Technology or equivalent from a University recognized by the Higher Education Commission</p> <p>ii. Two (2) years post qualification experience in Computer Operation.</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>• Electronic Data Processing</li> <li>• Management Information System</li> <li>• Networking</li> <li>• Data Communication</li> <li>• Introduction to Database</li> <li>• Operating System</li> <li>• Introductory Hardware &amp; Software Concepts</li> <li>• Introductory Programming Concepts</li> </ul>

**Scheme and Syllabus for Written Examination (Descriptive)  
for all Posts in BS-20 advertised under Consolidated  
Advertisement No. 02/2019**

(i)	Case No.	F.4-27/2019-R
	Particulars of post	<b>Chief /Joint Economic Adviser/Economic Consultant (BS-20)</b> , Economists Group, Ministry of Planning, Development and Reform.
	Minimum Qualification & Experience:	i. Second Class or Grade 'C' Master's degree in Economics or equivalent qualifications in Economics from a University recognized by HEC. ii. Fifteen (15) years post qualification experience in Economic Research, Development Economics, International Economics and other fields of Planning and Development.
(ii)	Case No.	F.4-37/2019-R
	Particulars of post	<b>Director General (BS-20)</b> , National Archives of Pakistan, Cabinet Division
	Minimum Qualification & Experience:	i. Second Class or Grade 'C' Master's degree in Chemistry/ History/ Political Science/Pakistan Studies from a recognized University. ii. Two publications in the field of Archives. 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.

**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 related to the advertised post. 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. 02/2019

### PAPER-I: ENGLISH

Max Marks: 100

Time Allowed: 3 Hours

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

### SUGGESTED READINGS

Sr. No.	Title	Author
1.	English Grammar in Use	Raymond Murphy (Cambridge University Press)
2.	Practical English Usage	M. Swan (Oxford University Press)
3.	The Little, Brown Handbook	H. Ramsey Flower & Jane Aaron (The Little, Brown & Co; Harper Collins)
4.	A University English Grammar	R. Quirk & S. Greenbaum (ELBS; Longmans)
5.	Write Better, Speak Better	Readers Digest Association
6.	Modern English in Action	Henry Christ (D.C. Heath & Co.)
7.	Exploring the World of English	Syed Saadat Ali Shah

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

Case No.	F.4-29/2019-R
Particulars of post	<b>Deputy Chief</b> (BS-19), Water Resources Section, Ministry of Planning, Development and Reform.
Minimum Qualification & Experience:	i. Second Class or Grade "C" Bachelor's Degree or equivalent qualifications in Civil Engineering or Agricultural Engineering. ii. Ten (10) years post qualification experience of operation, maintenance, drainage or research or planning relating to irrigation, drainage or flood control works of similar matters.

**Part-I: (Research and Planning)****50 Marks****i. Communication Skills, Technical Writing and Presentation Skills**

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

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

Project Management. Processes Integration Management, Project Plan Development, Project Plan Execution and Overall Change Control.

**b) Scope Management**

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

**c) Communications Management**

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

**d) Risk Management**

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

**e) Lab Work**

Computing Project Management Software, PERT, Gantt Chart/ Network, CPM, etc.

**f) Statistical Techniques**

All statistical techniques related to Planning & Research

**Part-II: (Engineering)****50 Marks****I. Civil Engineering Fundamentals:**

Structures; stress, strain, shearing force and bending moment concepts, beams, columns, footing. Simply supported and Cantilever beams, Pulleys and gears. Estimation, Quantity Surveying, Composite Schedule of Rates, Surveying and Levelling, Plain Tabling, Theodolite Survey;

**II. Fundamental of Irrigation**

Definition of irrigation, need for irrigation, sources of irrigation water, (surface water, groundwater and rainfall), utilization of water for agricultural purposes.

**III. Indus Basin Irrigation System:**

Components, operation and maintenance of Indus basin irrigation system, conveyance and distribution of irrigation water.

**IV. Irrigation Structures:**

Dams, barrages, Headworks, diversion structures, types and functions of outlets, desirable features/characteristics of outlets, design and construction of outlets, water measurement structures, energy dissipater, transition and erosion protection.

**V. Canal Design and Maintenance:**

Layout of canals, design of canals, Kennedy's and Lacy's theories, silt factor and friction factors, canal lining and its advantages, maintenance of canals.

**VI. Water Losses:**

Water losses in canals and watercourses, measurement of water losses and methods to alleviate water losses.

**VII. Flood Protection:**

Importance of floods in irrigation system operation, types of floods, damages caused by floods, methods of flood control and costing of flood protection structures.

**SUGGESTED READINGS**

S. No.	Title	Author
1.	Practical English Grammar	A.J. Thomson and A.V. Martinet.
2.	Writing. Intermediate	Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet.
3.	Writing. Upper-Intermediate	Rob Nolasco.
4.	Reading. Advanced	Brian Tomlinson and Rod Ellis.
5.	Study Skills	Riachard Yorky
6.	Writing. Advanced	Ron White.
7.	College Writing Skills	John Langan.
8.	Patterns of College Writing	Laurie G. Kirsznar and Stephen R. Mandell.
9.	The Mercury Reader. A Custom Publication.	Janice Neulib; Kathleen Shine Cain; Stephen Ruffus and Maurice Scharton.
10.	Project Management Body of Knowledge,	Project Management Institute (PMI) standards committee
11.	Software Project Management	S.A. Kelkar, A Concise Study, Prentice Hall of India.
12.	Plain and reinforced concrete	Nilson.
13.	Strength of material	Andrew Pytel and Singer.
14.	Surveying and Levelling	T.P Kanetaker.
15.	Irrigation and Drainage Engineering	Siddiqui, I. H.
16.	Irrigation Design and Practice	Withers, Bruce & Vipond, S
17.	Irrigated Agriculture of Pakistan	Ahmad, N. and Chaudhry, G.R.
18.	Water Resources of Pakistan	Ahmad, N.
19.	Irrigation Theory and Practice	Michal, A.M.
20.	Irrigation and Water Power Engineering	Arora, R.K.

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

Case No.	F.4-32/2019-R
Particulars of post	<b>Assistant Professor (Mathematics)</b> (BS-18), Military College Jhelum, Ministry of Defence.
Minimum Qualification & Experience:	Ph.D. Degree in the relevant subject with one (1) year post qualification teaching experience at College/ University level. <b>OR</b> M. Phil Degree in the relevant subject with three (3) years post qualification teaching experience at College/ University level. <b>OR</b> Second Class or Grade 'C' Master's Degree in the relevant subject from a university recognized by HEC with five (5) year post qualification teaching experience at College/ University level.

**Part-I: (Mathematics)****50 Marks****I. Vector Calculus**

Vector algebra; scalar and vector products of vectors; gradient divergence and curl of a vector; line, surface and volume integrals; Green's, Stokes' and Gauss theorems.

**II. Statics**

Composition and resolution of forces; parallel forces and couples; equilibrium of a system of coplanar forces; centre of mass of a system of particles and rigid bodies; equilibrium of forces in three dimensions.

**III. Dynamics**

- Motion in a straight line with constant and variable acceleration; simple harmonic motion; conservative forces and principles of energy.
- Tangential, normal, radial and transverse components of velocity and acceleration; motion under central forces; planetary orbits; Kepler laws;

**IV. Ordinary differential equations**

- Equations of first order; separable equations, exact equations; first order linear equations; orthogonal trajectories; nonlinear equations reducible to linear equations, Bernoulli and Riccati equations.
- Equations with constant coefficients; homogeneous and inhomogeneous equations; Cauchy-Euler equations; variation of parameters.
- Ordinary and singular points of a differential equation; solution in series; Bessel and Legendre equations; properties of the Bessel functions and Legendre polynomials.

**V. Fourier series and partial differential equations**

- Trigonometric Fourier series; sine and cosine series; Bessel inequality; summation of infinite series; convergence of the Fourier series.
- Partial differential equations of first order; classification of partial differential equations of second order; boundary value problems; solution by the method of separation of variables; problems associated with Laplace equation, wave equation and the heat equation in Cartesian coordinates.

**VI. Numerical Methods**

- Solution of nonlinear equations by bisection, secant and Newton-Raphson methods; the fixed- point iterative method; order of convergence of a method.
- Solution of a system of linear equations; diagonally dominant systems; the Jacobi and Gauss-Seidel methods.
- Numerical solution of an ordinary differential equation; Euler and modified Euler methods; Runge- Kutta methods.

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

- Elements of Curriculum.
- Curriculum Development Process: Need Assessment, Formulation of Aims and Objectives.

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

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

**III. Educational Assessment and Evaluation**

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

**IV. Educational Administration and Supervision**

- The Concept of Administration
- Educational Supervision

**V. Research Methods in Education**

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

**SUGGESTED READINGS**

<b>S.No.</b>	<b>Title</b>	<b>Author</b>
1.	An Introduction to Vector Analysis	Khalid Latif,
2.	Introduction to Mechanics	Q.K. Ghorl
3.	An Intermediate Course in Theoretical Mechanics	Khalid Latif,
4.	Differential Equations with Boundary Value Problems	D. G. Zill and M. R. Cullen
5.	Elementary Differential Equations	E.D. Rainville, P.E. Bedient and R.E. Bedient
6.	Elements of Numerical Analysis	F. Ahmad and M.A Rana
7.	Mathematical Methods	S. M. Yousaf, Abdul Majeed and Muhammad Amin
8.	Research in Education	JW Best
9.	Integrating Education Technology into Teaching	Roblyer
10.	Curriculum Development	S. M. Shahid
11.	Educational Measurement and Evaluation	S. M. Shahid
12.	Educational Administration	S. M. Shahid

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

Case No.	F.4-33-A/2019-R
Particulars of post	<b>Assistant Professor (Female) (Biology)</b> (BS-18), Directorate of Federal Government Educational Institutions (Cantt/Garrisons) Colleges, Ministry of Defence.
Minimum Qualification & Experience:	Ph. D Degree in the relevant subject with one (1) year post qualification teaching experience at College/ University level. <b>OR</b> M. Phil Degree in the relevant subject with three (3) year post qualification teaching experience at College/ University level <b>OR</b> Second Class or Grade 'C' Master's Degree in the relevant subject from a University recognized by HEC with five (5) year post qualification teaching experience at College/ University level

**Part-I: (Biology)****50 Marks****I. Anatomy and Embryology**

- Primary and secondary tissues. Meristems. Secondary growth in dicot stem. Anatomy of leaf, stem and root.
- Micro and megasporogenesis, pollination mechanism, fertilization, development of Embryo and Endosperm, Seed dispersal.

**II. Plant Physiology**

- Plant water relations, Osmotic Quantities, component potentials of water and their role in transport, water absorption by roots, transpiration. Role of essential mineral elements and their uptake. Plant hormones. Photoperiodism, Vernalization. Dormancy and Seed germination. Enzymes.
- Photosynthesis: Plant pigments, Light reaction, CO<sub>2</sub> fixation, Mechanism of photophosphorylation.
- Respiration: Glycolysis, Krebs cycle, Mechanism of oxidative phosphorylation.

**III. Genetics & Evolution**

- Mendelian Genetics, Multiple Alleles, Polygenic inheritance, Gene interaction, Epistasis and pleiotropy, Sex-linked inheritance, Chromosomal aberrations, Mutations, DNA repair.
- Introduction of Evolution, Evolutionary history, Evolution of life, Convergent Evolution, Divergent Evolution, Parallel Evolution and Natural selection

**IV. Molecular Biology**

- Nucleic acids, DNA as hereditary material, DNA replication, Transcription, Genetic code, Protein synthesis, Genetic engineering and its application, Genetically Modified Organisms (GMO).

**V. Animal Form and Function**

- Protection, Support and Movement: Integumentary system of invertebrates and vertebrates; Animal muscles: the muscular system of invertebrates and vertebrates.
- Digestion and Nutrition: Feeding mechanism, Digestion, Organization and regional function of alimentary canal, Regulation of food intake, Nutritional requirements
- Internal Fluids and Respiration: Internal fluid environment, Composition of blood, Circulation and respiration mechanisms
- Nervous Coordination: Nervous system and Senses: Functional units of nervous system, Synapses junctions between nerves.
- Chemical Coordination: Endocrine System; Vertebrate endocrine glands and types of hormones, Mechanism of hormones action,

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

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

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

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

**III. Educational Assessment and Evaluation**

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

**IV. Educational Administration and Supervision**

- The Concept of Administration
- Educational Supervision

**V. Research Methods in Education**

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



**SUGGESTED READINGS**

<b>S. No.</b>	<b>Title</b>	<b>Author</b>
1.	Comparative Morphology of the Vascular Plants	Foster, A.S. and E.H. Gifford. 1989
2.	Genetics: A Conceptual Approach. 4 <sup>th</sup> edition	Pierce, B. A. 2012
3.	Molecular Cell Biology	Lodish, H., A. Berk, S.L. Zipursky, P. Matsudaira, D. Baltimore and J. Darnell 2000
4.	Ilmi Biomolecules, Cell Biology and Genetics.	Cheema, T.A. and Cheema Z.T. 2009
5.	Growth and Differentiation in Plants	Phillips and Wareings
6.	Animal behavior:- An Evolutionary Approach	John Alcock
7.	Biology	Campbell, N.A.
8.	Research in Education	JW Best
9.	Integrating Education Technology into Teaching	Roblyer
10.	Curriculum Development	S. M. Shahid
11.	Educational Measurement and Evaluation	S. M. Shahid
12.	Educational Administration	S. M. Shahid

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

Case No.	F.4-33-B/2017-R
Particulars of post	<b>Assistant Professor (Female) (Computer Science) (BS-18)</b> , Directorate of Federal Government Educational Institutions (Cantt/Garrisons) Colleges, Ministry of Defence.
Minimum Qualification & Experience:	Ph. D Degree in the relevant subject with one (1) year post qualification teaching experience at College/ University level. <b>OR</b> M. Phil Degree in the relevant subject with three (3) year post qualification teaching experience at College/ University level <b>OR</b> Second Class or Grade 'C' Master's Degree in the relevant subject from a University recognized by HEC with five (5) year post qualification teaching experience at College/ University level

**Part-I: (Computer Science)****50 Marks****I. Computer Architecture**

Microprocessor Bus Structure (Address/Data/Control), Registers and Flags, Storage Hierarchy (Main/Virtual/Cache/Secondary memory), Peripheral communication, CPU, ALU, Principles of Instruction Set Design, Multiprocessors & Thread Level Parallelism.

**II. Object Oriented Programming**

Data types, control structures, functions, arrays, classes, methods, object and encapsulation; constructors and destructors, operator and function overloading, virtual functions, derived classes, inheritance and polymorphism, I/O and file processing.

**III. Data Structure and Algorithms**

Stack and Queue, Sequential Search, Binary Search, Bubble sort, Merge sort, Quick sort, Insertion sort, Selection Sort, Linked Lists, Infix to postfix conversions, Expression tree construction, Tree traversals, Graph representation and traversal, Minimum spanning tree.

**IV. Database Management Systems**

Entity Relationship modeling, Relational data model and algebra, Structured Query language, Database design, functional dependencies and normal forms, concurrency control and recovery techniques, Database security and authorization.

**V. Computer Communications and Networks**

Asynchronous and Synchronous transmission, LAN/WAN/MAN, Network layers, Transport layer protocols TCP/IP, UDP, Error Control, Flow Control, Multiplexing, Routing, Bridging, Network security issues.

**VI. Operating Systems**

Process and CPU management, Multithreading, Deadlocks, Memory management and virtual memory, External Fragmentation, Paging and Demand Paging, File management systems, Scheduling and dispatch, Introduction to concurrency.

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

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

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

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

**III. Educational Assessment and Evaluation**

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

**IV. Educational Administration and Supervision**

- The Concept of Administration
- Educational Supervision

**V. Research Methods in Education**

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

**Suggested Reading**

<b>S.No.</b>	<b>Title</b>	<b>Author</b>
1.	Modern Operating Systems	Andrew S. Tanenbaum
2.	Operating System Concepts	Addison-Wesley
3.	Algorithms and Data Structures	N. Wirth
4.	Data structures	Aaron M. Tanenbaum,
5.	Database Systems: A Practical Approach to Design, Implementation and Management	R.Connolly and P.Begg
6.	Introduction to Computer Networks	A. S. Tanenbaum
7.	Computer Networks and Internets	Douglas E. Comer
8.	Computer Architecture: A Quantitative Approach	Hennessy & Patterson
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.4-33-C/2017-R
Particulars of post	<b>Assistant Professor (Female) (Islamiyat)</b> (BS-18), Directorate of Federal Government Educational Institutions (Cantt/Garrisons) Colleges, Ministry of Defence.
Minimum Qualification & Experience:	Ph. D Degree in the relevant subject with one (1) year post qualification teaching experience at College/ University level. <b>OR</b> M. Phil Degree in the relevant subject with three (3) year post qualification teaching experience at College/ University level <b>OR</b> Second Class or Grade 'C' Master's Degree in the relevant subject from a University recognized by HEC with five (5) year post qualification teaching 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.

### I اسلامی ضابطہ حیات

- اسلامی نظام کی نمایاں خصوصیات:

- سماجی نظام
- سیاسی نظام
- اقتصادی نظام
- عدالتی نظام
- انتظامی نظام

- سرکاری ملازمین کی ذمہ داریاں

### II سیرت النبی کا مطالعہ

سیرت النبی کے مطالعہ کی اہمیت اور ضرورت بطور:

- نمونہ عمل
- پیغمبر امن
- مبلغ
- سفارت کار
- معلم انسانیت
- انقلابی رہنما

### III اسلامی تہذیب و ثقافت

- اسلامی تہذیب و ثقافت کے معانی اور اہم اجزا
- سماج اور انسانی شخصیت کی تعمیر میں تہذیب کا کردار

- اسلامی تہذیب کے نمایاں اوصاف:

- توحید
- رسالت
- تزکیہ نفس
- انسانی عزت و وقار
- مساوات
- سماجی انصاف
- اخلاقی اقدار
- صبر و برداشت
- قانون کی حکمرانی

IV اسلام اور دنیا:

- اسلامی تہذیب کے مغرب اور مغرب کے اسلامی تہذیب پر اثرات
- اسلام اور عصر حاضر کے چیلنجز
- مشرق اور مغرب کے درمیان بات چیت
- جدید دنیا میں اسلام کا مقام

## Part-II: (Professional)

50 Marks

### I. Development of Curriculum and Instructional Material

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

### II. Process of Teaching and Teaching Strategies

- Process of Classroom Communication
- Factors affecting Classroom Communication

- Barriers to Classroom Communications
- Use of Instructional Materials and Media

### III. Educational Assessment and Evaluation

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

### IV. Educational Administration and Supervision

- The Concept of Administration
- Educational Supervision

### V. Research Methods in Education

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

## SUGGESTED READINGS

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.4-33-D/2017-R
Particulars of post	<b>Assistant Professor (Female) (Health &amp; Physical Education)</b> (BS-18), Directorate of Federal Government Educational Institutions (Cantt/Garrisons) Colleges, Ministry of Defence.
Minimum Qualification & Experience:	Ph. D Degree in the relevant subject with one (1) year post qualification teaching experience at College/ University level. <b>OR</b> M. Phil Degree in the relevant subject with three (3) year post qualification teaching experience at College/ University level <b>OR</b> Second Class or Grade 'C' Master's Degree in the relevant subject from a University recognized by HEC with five (5) year post qualification teaching experience at College/ University level

**Part-I: (Health and Physical Education) 50 Marks****I. Philosophical Basis of Physical Education**

Philosophy and Physical Education, Physical Education as Discipline, Scientific Foundation of Physical Education, Physical Education and Recreation, Leadership in Physical Education

**II. Scientific Sports Coaching**

Sports Planning, Periodisation of Training, Systemization of Training, Data Collection, Coach and Professional Ethics

**III. Evaluation in Physical Education and Sports**

Evaluation and Administration of Tests, Basic Statistics, Measurement of Physical Fitness, General Motor Ability, Cardiovascular Fitness, Rating Scales in Physical Education.

**IV. Exercise Physiology**

Muscular System and Exercise, Cardiovascular System and Exercise, Environment and Exercise, Nervous System and Exercise, Glandular System and Exercise, Gender Differences, Obesity

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

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

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

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



**III. Educational Assessment and Evaluation**

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

**IV. Educational Administration and Supervision**

- The Concept of Administration
- Educational Supervision

**V. Research Methods in Education**

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

**SUGGESTED READINGS**

<b>S. No.</b>	<b>Title</b>	<b>Author</b>
1.	Health & Physical Education.	Dr. A. Waheed Mughal
2.	Education in Physical Education.	Shamshad Ahmed
3.	Sports in Society : Issue & Controversies,	Jay Coackley
4.	Modern Measurement.	Osterlind J. Steven
5.	Introduction to Measurement in PE and Exercise Science	Margaret J. Safrit PhD, Terry M. Wood PhD
6.	Physiology of Sports	Reilly T and Williams
7.	Essentials of Exercise Physiology.	Shaver
8.	Research in Education	JW Best
9.	Integrating Education Technology into Teaching	Roblyer
10.	Curriculum Development	S. M. Shahid
11.	Educational Measurement and Evaluation	S. M. Shahid
12.	Educational Administration	S. M. Shahid

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

Case No.	F.4-33-E/2017-R
Particulars of post	<b>Assistant Professor (Female) (History)</b> (BS-18), Directorate of Federal Government Educational Institutions (Cantt/Garrisons) Colleges, Ministry of Defence.
Minimum Qualification & Experience:	Ph. D Degree in the relevant subject with one (1) year post qualification teaching experience at College/ University level. <b>OR</b> M. Phil Degree in the relevant subject with three (3) year post qualification teaching experience at College/ University level <b>OR</b> Second Class or Grade 'C' Master's Degree in the relevant subject from a University recognized by HEC with five (5) year post qualification teaching experience at College/ University level

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

- I. **Muslim Rule and Heritage in India** (712-1857): Political History Arrival, foundation and consolidation of Muslim rule in India, important rulers of the Slave Dynasty and the Mughals. The Spirit and legacy of Muslim civilization, Art, Architecture and literature, Public Administration under Muslim Rules. Sultans, Kings, Economic, Social, Judicial, Civil and Military system during the Muslim rule, Industry, trade and commerce under the Muslim patronage, Financial Administration.
- II. **British Rule in India:** 1857-1947: British Imperialism, origin and growth of the East India Company, Causes and effects of downfall of the Mughal Empire in India, War of Independence in 1857: Causes and effects.
- III. **Muslim Struggle for Independence:** Role of Shah Wali Ullah, Syed Ahmad Shaheed and Sir Syed Ahmed Khan towards regeneration of the Muslim of South Asia, All India Muslim League, Partition of Bengal, Simla Deputation, Lucknow pact; Khilafat movement. Nahru Report, Quaid-i- Azam's Fourteen Points.
- IV. **Pakistan Movement:** Allama Iqbal's Allahabad Address 1930, and Round Table Conference. The Congress Rule in the provinces-1937-1939, Lahore Resolution 1940, various Missions and Plans for the partition of the South Asia. Founders of Pakistan: Quaid-i-Azam, Mohsin-ul-Mulk, Syed Amir Ali, Ali Brothers. Sir Agha Khan, Ch. Khaliq uz Zaman, Chaudhry Rahmat Ali, etc.
- V. **Separation of East Pakistan:** Causes and Effects.
- VI. **Working of Democracy in Pakistan:** Liaquat Ali Khan to Feroz Khan Noon (1947-1958), Zulfikar Ali Bhutto's Period,(1971-1977),Benazir, Nawaz Sharif, Revival of Democracy: 1988-1999, Restoration of Democracy (2008 to date), Role of Major Political Parties and Pressure Groups in the history of Pakistan.

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

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

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

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

**III. Educational Assessment and Evaluation**

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**IV. Educational Administration and Supervision**

- The Concept of Administration
- Educational Supervision

**V. Research Methods in Education**

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

**SUGGESTED READINGS**

S. No.	Title	Author
1.	India's Struggle for Independence	Chandre Bipin, 1989
2.	Wavell and the Days of the Raj: Britain's Penultimate Viceroy in India,	Chawla, Muhammad Iqbal, 2011
3.	The Charismatic Leader: Jinnah and the Creation of Pakistan	Hayat, Sikandar, 2007
4.	Muslim Civilization of Indo-Pakistan.	Ikram, Shaikh Muhammad, 1966
5.	Constitutional and Political History of Pakistan	Khan, Hamid, 2005
6.	The Military and Politics in Pakistan 1947-86	Rizvi Hassan Askari
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.4-36/2019-R
Particulars of post	<b>Assistant Electronics Adviser</b> (BS-18), Ministry of Science & Technology
Minimum Qualification & Experience:	<p>1) Second Class or Grade 'C' M.Sc. in Physics with specialization in Electrical/Electronics or equivalent qualification from University recognized by HEC.</p> <p style="text-align: center;"><b>OR</b></p> <p>Second Class or Grade 'C' B.E/B.Sc. (Engineering) in Electrical/Electronics/Telecommunication/Instrumentation/Control System/ Power/ Aerospace/Avionics/Mechatronics recognized by Pakistan Engineering Council (PEC).</p> <p>2) Five (5) years post qualification experience in Research &amp; Development/Science &amp; Technology Management.</p>

**Part-I: (Research and Planning)****50 Marks****i. Communication Skills, Technical Writing and Presentation Skills**

Paragraph writing, Essay writing, Translation skills, Academic skills, Academic writing, Technical Report writing, Progress report writing,

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

Project Management. Processes Integration Management, Project Plan Development, Project Plan Execution and Overall Change Control.

**b) Time Management**

Activity Definition, Activity Sequencing, Activity Duration Estimation, Schedule Development and Schedule Control.

**c) Risk Management**

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

**d) Procurement Management**

Procurement Planning, Solicitation Planning, Solicitation, Source Selection, Contract Administration and Contract Close-Out.

**e) Statistical Techniques**

All statistical techniques related to Planning & Research

**Part-II: 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

### SUGGESTED READINGS

S. No.	Title	Author
1.	Practical English Grammar	A.J. Thomson and A.V. Martinet.
2.	Writing. Intermediate	Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet.
3.	Writing. Upper-Intermediate	Rob Nolasco.
4.	Reading. Advanced	Brian Tomlinson and Rod Ellis.
5.	Study Skills	Riachard Yorky
6.	Writing. Advanced	Ron White.
7.	College Writing Skills	John Langan.
8.	Patterns of College Writing	Laurie G. Kirsner and Stephen R. Mandell.
9.	The Mercury Reader. A Custom Publication.	Janice Neulib; Kathleen Shine Cain; Stephen Ruffus and Maurice Scharton.
10.	Project Management Body of Knowledge,	Project Management Institute (PMI) standards committee
11.	Software Project Management	S.A. Kelkar, A Concise Study, Prentice Hall of India.
12.	Human Resource Management	H.T. Graham & Roger Bennett
13.	Management	James A.F. Stoner, R. Edward Freeman, Daniel R. Gilbert Jr.
14.	Understanding Computer: Today and Tomorrow	Deborah Morley, Charles Parker
15.	MS Office 365 Handbook: 2013 Edition	Kevin Wilson
16.	Governance	Anne Mette Kjær

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

Case No.	F.4-39/2019-R
Particulars of post	<b>Assistant Chief</b> (BS-18), Health Section, Ministry of Planning, Development and Reform.
Minimum Qualification & Experience:	i. Second Class or Grade 'C' Master's degree or equivalent qualification in Health Planning, Nutrition Planning. <b>OR</b> M.B.B.S. or equivalent. ii. Three (3) years post qualification experience of work and/ or research relating to medicine, surgery or public health or in planning and development in these fields.

**Part-I: (Research and Planning)****50 Marks****i. Communication Skills, Technical Writing and Presentation Skills**

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

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

Project Management. Processes Integration Management, Project Plan Development, Project Plan Execution and Overall Change Control.

**b) Scope Management**

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

**c) Risk Management**

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

**d) Lab Work**

Computing Project Management Software, PERT, Gantt Chart/ Network, CPM, etc.

**e) Statistical Techniques**

All statistical techniques related to Planning & Research

**Part-II: (Public Health)****50 Marks****i. Meaning and Significance of Health Education**

- Definition and scope of Health Education
- Relationship of Health Education with Physical Education
- Importance of Health Education in Community

**ii. Community Health**

- Concepts in Community Health
- Health & Welfare
- Health & Development
- Infectious diseases, Epidemiology
- Disease Transmission
- Immunity
- Disease prevention and control
- Disinfection

- i. Symptoms, causes and prevention of most common communicable diseases
- j. Epidemiology of non-communicable diseases and condition
- iii. **Environment and Human Health**
  - a. Toxic pollutants and their effect on health
  - b. Mechanisms of action of drugs producing toxic effects of drugs on human body
  - c. Carcinogenic agents
  - d. Chemicals and pesticides residues in food.
  - e. Biological effects of Radiation
  - f. Sources of pollution: Air, Water, Noise

### SUGGESTED READINGS

S. No.	Title	Author
1.	Practical English Grammar	A.J. Thomson and A.V. Martinet.
2.	Writing. Intermediate	Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet.
3.	Writing. Upper-Intermediate	Rob Nolasco.
4.	Reading. Advanced	Brian Tomlinson and Rod Ellis.
5.	Study Skills	Riachard Yorky
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7.	College Writing Skills	John Langan.
8.	Patterns of College Writing	Laurie G. Kirsznern and Stephen R. Mandell.
9.	The Mercury Reader. A Custom Publication.	Janice Neulib; Kathleen Shine Cain; Stephen Ruffus and Maurice Scharton.
10.	Project Management Body of Knowledge,	Project Management Institute (PMI) standards committee
11.	Software Project Management	S.A. Kelkar, A Concise Study, Prentice Hall of India.
12.	Global Climatic Change,.	Houghton and R A,
13.	Health Factors for College Students.	Maude Lee & Heredge E T.
14.	Synopsis of Hygiene and Public Health.	Dr Jabalpur K S Shah
15.	Community Health.	Anderson and Mortengreen
16.	Environmental Health,	Willgoose

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

Case No.	F.4-43/2019-R
Particulars of post	<b>Senior Librarian (BS-18), Intelligence Bureau</b>
Minimum Qualification & Experience:	i. Second Class or Grade 'C' Master's degree in Library Science/ Information Science or equivalent qualification from a University recognized by HEC ii. Five (5) years post qualification experience in BS-17 and above or equivalent in the relevant field. <b>OR</b> i. Second Class or Grade 'C' Bachelor's Degree with Diploma in Library Science from a recognized University/ Institute. ii. Eight (8) years post qualification experience in BS-17 and equivalent in the relevant field.

**Library and Information Science: 100 Marks****I. Information, Library and Society**

Nature of information and knowledge. Library and Information Profession, Library and its role in Society. Information society. Communication and information management. Social information. Economic aspects of information. Information policy. Freedom of information. Information privacy. Intellectual property. Information ethics.

**II. 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.

**III. Organization of Information**

Historical development of the 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.

**IV. Basic Reference Sources**

Definition. Evaluation Criteria. Bibliographies-- General bibliographies, Basic guides to reference materials, Library catalogs; Serials guides; Indexes and abstracts; HEC NDL; Dictionaries and thesauri; Almanacs and fact books; Encyclopedias; Directories; Biographical sources; Geographical sources-- Maps, atlases & gazetteers; Reference Web sites; Internet Public Library (<http://www.ipl.org/div/subject/browse/ref00.00.00>). Evaluation



## V. 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.

## VI. Research Methodology

Definition. Types of research. Research methods. Research problem. Theory formulation. Literature review. Research questions / hypotheses. Sampling. Data collection. Data analysis and Interpretation. Report writing. Dissemination of results. Research proposal. Research ethics. Research in library & information science.

### SUGGESTED READINGS

S. No.	Title	Author
1.	Practical research methods for librarians and information professionals.	Beck, S. E., & Manuel, K. (2007).
2.	Reference and information services: An introduction.	Bopp, R. E., & Smith, L. C. (2001).
3.	Future Librarians: dreams, Madness & reality.	Crawford, W and Gorman, Micheal(1995).
4.	Management basics for information professionals.	Evans, G. E., Layzell Ward, P., Rugaas, B., & Evans, G. E. (2007).
5.	Computers for librarians: An introduction to the electronic library.	Ferguson, S., & HeBELS, R. (2003).
6.	Libraries in society.	Gerard, D. (1978).
7.	Organising knowledge in a global society: Principles and practice in libraries and information centres.	Harvey, D. R., Hider, P., & Harvey, D. R. (2004).
8.	Introduction to reference work: Vol. 1,	Katz, W. A. (2002).
9.	Paper to digital: Documents in the information age.	Liu, Z. (2008).
10.	The practical library manager.	Massis, B. E. (2003).
11.	Internet technologies and information services.	Miller, J. B. (2008).
12.	The electronic library.	Rowley, J. (2001).
13.	Organizing knowledge: An introduction to managing access to information.	Rowley, J. E., & Farrow, J. (2000).
14.	Library and information centre management.	Stueart, R. D. & Moran, B. B. (2007).
15.	The organization of Information.	Taylor, A. G., & Joudrey, D. N. (2008).
16.	The information age: Current controversies.	Torr, J. D. (2003).

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

Case No.	F.4-46/2019-R
Particulars of post	<b>Director</b> (BS-19), Intelligence Bureau
Minimum Qualification & Experience:	<p>i. Second Class or Grade 'C' Master's Degree in Strategic Studies/International Relations/Sociology/Political Science/History/ Pakistan Studies/Psychology/Public Administration/Economics/Electronics or equivalent qualification from a University recognized by HEC.</p> <p>ii. Twelve (12) years post qualification experience in BPS-17 and above in Government Department (s) including six (6) years experience in Intelligence functions</p> <p style="text-align: center;"><b>OR</b></p> <p>i. Ph. D. in Defence &amp; Strategic Studies/International Relations/Political Science/ History/ Pakistan Studies from a University recognized by HEC.</p> <p>ii. Eight (8) years post qualification experience in BPS-17 and above in Government Department (s) including three (3) years experience in Intelligence functions</p>

**Part-I: 50 Marks**

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

**I. Human Resource and Financial Management**

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

**II. Basic Concept of Quality Management**

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

**III. Information Technology and MS Office**

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

**Part-II: 50 Marks**

(Public Administration &amp; Office Management)

- I. **Public Administration:** Nature and scope, Role of Public Administration in a modern Welfare State;
- II. **Bureaucracy:** Concept of Bureaucracy, Theories of Bureaucracy, Ecology of Bureaucracy; Bureaucracy of Pakistan as a Change Agent;
- III. **Administrative Leadership:** Approaches to the study of Leadership, Forms of Leadership, Leadership qualities;
- IV. **Administrative Accountability:** Internal and External Controls; Executive Control, Legislative Control, Judicial Control, Ombudsman, Public Opinion and Pressure Groups; Problems of Administrative Accountability in Pakistan;
- V. **Planning:** Types of Plans, Planning Process; Principles of Planning, Planning Machinery in Pakistan;
- VI. **Controlling and Co-Ordination:** Forms of Controls, Control Mechanism, the process of Control, Principles of Controlling; Principles of Coordination; Machinery for Coordination; Problems of Coordination in Public Administration in Pakistan.
- VII. Civil Servant Act 1973 and Rules made thereunder;
- VIII. PPRA Ordinance 2002 and Rules 2004.

**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.	An Introduction to the Public Administration	E.N. Cladden
6.	Bureaucracy: Modern Society	Pebr, M.Blau.
7.	Public Administration for a Welfare State	Paul Abbleby
8.	The Bureaucracy of Pakistan	Charles F. Kennedy

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

Case No.	F.4-49/2019-R
Particulars of post	<b>Deputy Director</b> (BS-18), Intelligence Bureau
Minimum Qualification & Experience:	<p>i. Second Class or Grade 'C' Master's Degree in Strategic Studies/International Relations/Sociology/Political Science/History/ Pakistan Studies/Psychology/Public Administration/Economics/Electronics or equivalent qualification from a University recognized by HEC.</p> <p>ii. Five (5) years post qualification experience in BPS-17 and above in Government Department (s) including three (3) years experience in Intelligence functions.</p> <p style="text-align: center;"><b>OR</b></p> <p>i. M.Phil. in Defence &amp; Strategic Studies/International Relations/Political Science/ History/ Pakistan Studies.</p> <p>ii. Three (3) years post qualification experience in BPS-17 and above in Government Department (s) including two (2) years experience in Intelligence functions.</p>

**Part-I: 50 Marks**

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

**I. Human Resource and Financial Management**

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

**II. Basic Concept of Quality Management**

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

**III. Information Technology and MS Office**

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

## Part-II: 50 Marks

(Public Administration & Office Management)

- I. **Public Administration:** Nature and scope, Role of Public Administration in a modern Welfare State;
- II. **Bureaucracy:** Concept of Bureaucracy, Theories of Bureaucracy, Ecology of Bureaucracy; Bureaucracy of Pakistan as a Change Agent;
- III. **Administrative Leadership:** Approaches to the study of Leadership, Forms of Leadership, Leadership qualities;
- IV. **Administrative Accountability:** Internal and External Controls; Executive Control, Legislative Control, Judicial Control, Ombudsman, Public Opinion and Pressure Groups; Problems of Administrative Accountability in Pakistan;
- V. **Planning:** Types of Plans, Planning Process; Principles of Planning, Planning Machinery in Pakistan;
- VI. **Controlling and Co-Ordination:** Forms of Controls, Control Mechanism, the process of Control, Principles of Controlling; Principles of Coordination; Machinery for Coordination; Problems of Coordination in Public Administration in Pakistan.
- VII. Civil Servant Act 1973 and Rules made thereunder;
- VIII. PPRA Ordinance 2002 and Rules 2004.

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S. No.	Title	Author
1.	Human Resource Management	H.T.Graham & Roger Bennett
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3.	Understanding Computer: Today and Tomorrow	Deborah Morley, Charles Parker
4.	MS Office 365 Handbook: 2013 Edition	Kevin Wilson
5.	An Introduction to the Public Administration	E.N. Cladden
6.	Bureaucracy: Modern Society	Pebr, M. Blau.
7.	Public Administration for a Welfare State	Paul Abbleby
8.	The Bureaucracy of Pakistan	Charles F. Kennedy

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

Case No.	F.4-51/2019-R
Particulars of post	<b>Assistant Chief</b> (BS-18), Education Section, Ministry of Planning, Development and Reform.
Minimum Qualification & Experience:	i. Second Class or Grade 'C' Master's Degree or equivalent qualification in Education or Second Class or Grade 'C' Master's Degree or equivalent qualification in any discipline with Bachelor's Degree or equivalent qualification in Education. ii. Three (3) years post qualification experience of work and/or research relating to Education or in planning or development in Education.

**Part-I: (Research and Planning)****50 Marks****i. Communication Skills, Technical Writing and Presentation Skills**

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

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

Project Management. Processes Integration Management, Project Plan Development, Project Plan Execution and Overall Change Control.

**b) Scope Management**

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

**c) Time Management**

Activity Definition, Activity Sequencing, Activity Duration Estimation, Schedule Development and Schedule Control.

**d) Risk Management**

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

**e) Lab Work**

Computing Project Management Software, PERT, Gantt Chart/ Network, CPM, etc.

**f) Statistical Techniques**

All statistical techniques related to Planning & Research

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

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

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

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

**III. Educational Assessment and Evaluation**

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

**IV. Educational Administration and Supervision**

- The Concept of Administration
- Educational Supervision

**V. Research Methods in Education**

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

**SUGGESTED READINGS**

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