

**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. 05/2016**

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Topics of Syllabi
1.	27/2016	Nursery School Teacher (Female) (BS-16), F.G. Colleges Islamabad, Federal Directorate of Education, Capital Administration & Development Division	Second Class or Grade 'C' B.Sc. Home Economics with B.Ed. or Montessori Education.	Objective Type Test (MCQ)  <b>Part-I</b> English =20 marks  <b>Part-II</b> Subject Test=40 marks  <b>Part-III</b> Professional Test=40 marks	<b>Part-I</b> Grammar Usage, Sentence Structuring <b>Part-II (Bachelor's Level)</b> <ul style="list-style-type: none"> <li>• Introduction to Home Economics</li> <li>• Fundamentals of Food and Nutrition</li> <li>• Meal Management &amp; Food Preservation</li> <li>• Home Management</li> <li>• Childhood and Adolescent Development and their Guidance</li> <li>Family &amp; Community Development</li> </ul> <b>Part-III</b> <ul style="list-style-type: none"> <li>• Education System in Pakistan,</li> <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>
2.	47/2016	Assistant Librarian (Female) (BS-16), F.G. Colleges Islamabad, Federal Directorate of Education, Capital Administration & Development Division	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>• Introduction to Library &amp; Information Science</li> <li>• Information Sources and Services</li> <li>• Classification: Theory and Practice</li> <li>• Cataloguing: Theory and Practice</li> <li>• Procurement and Maintenance of Library Books</li> <li>• Management of Libraries &amp; Information Centres</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 of 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
3.	50/2016	Librarian (Male) (BS-17), F.G. Colleges Islamabad, Federal Directorate of Education, Capital Administration & Development Division.	<p>Second Class or Grade 'C' Master's Degree in Library Science/ Information Science.</p> <p style="text-align: center;"><b>OR</b></p> <p>Graduate with Diploma in Library Science from a University.</p> <p style="text-align: center;"><b>OR</b></p> <p>Bachelor of Library Science plus 5 years post qualification professional experience in BS-16 otherwise 8 years experience if not in BS-16.</p> <p style="text-align: center;"><b>OR</b></p> <p>Second Class or Grade 'C' Master's Degree in relevant subject with Diploma in Library Science or Bachelor of Library Science.</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> Vocabulary, Grammar usage, Sentence Structuring.</p> <p><b>Part-II</b></p> <ul style="list-style-type: none"> <li>• Introduction to Library &amp; Information Science</li> <li>• Information Sources and Services</li> <li>• Classification: Theory and Practice</li> <li>• Cataloguing: Theory and Practice</li> <li>• Procurement, maintenance and issuance of library books</li> <li>• Management of libraries &amp; Information Centres</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 of Write off the Library Losses</li> </ul>
4.	77/2016	Drawing Mistress (BS-16), Federal Government Girls Schools, Federal Directorate of Education, Capital Administration & Development Division	<p>Second Class or Grade 'C' BA/B.Sc. Degree with B.Ed. alongwith one year Diploma in Drawing.</p> <p style="text-align: center;"><b>OR</b></p> <p>Second Class or Grade 'C' Bachelor Degree in Fine Arts with B.Ed.</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>Part-I</b> Grammar Usage, Sentence Structuring</p> <p><b>Part-II</b></p> <ul style="list-style-type: none"> <li>• Drawing &amp; Design Theory</li> <li>• Free Hand Sketches and Projected Measured Drawings</li> <li>• Technical Drawings and Diagrammatic Illustrations</li> <li>• Painting: Basic elements of Art, concepts, media and formats and the ability to apply them to their aesthetic intent.</li> <li>• Printmaking: Basic elements of art and design principles, concepts, media, and formats.</li> </ul> <p><b>Part-III</b></p> <ul style="list-style-type: none"> <li>• Education System in Pakistan,</li> <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
5.	78/2016	Deputy Headmistress (BS-17), Federal Government Schools, Federal Directorate of Education, Capital Administration & Development Division.	Second Class or Grade 'C' Master's Degree with B.Ed/M.Ed.	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>• Planning &amp; Management in Education</li> <li>• Educational Administration and Supervision,</li> <li>• Educational Psychology</li> <li>• Educational Guidance &amp; Counselling</li> <li>• Classroom/Institutional Management</li> <li>• Curriculum Development</li> <li>• Teaching Techniques &amp; Methodology</li> <li>• Testing &amp; Evaluation</li> <li>• Educational Reforms in Pakistan</li> <li>• Perspectives of Education in Pakistan</li> </ul>
6.	107/2016	Assistant Private Secretary (BS-16), Geological Survey of Pakistan , Ministry of Petroleum and Natural Resources.	i. Second Class or Grade 'C' Bachelor's degree from a University recognized by HEC. ii. Minimum shorthand speed 100 W.P.M. and typing speed 50 W.P.M. iii. Must be computer literate.	<ul style="list-style-type: none"> <li>• Typing Test with minimum Speed of 50 W.P.M 50 Marks</li> <li>• Shorthand Test with minimum Speed of 100 W.P.M 50 Marks</li> </ul>	
7.	113/2016	Pharmacist (BS-17), Federal General Hospital, Chak Shehzad, Islamabad, Cabinet Division.	Bachelor's degree in 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>• Physical Pharmacy,</li> <li>• Clinical Pharmacy,</li> <li>• Industrial Pharmacy,</li> <li>• Hospital Pharmacy,</li> <li>• Pharmaceutical Chemistry,</li> <li>• Pharmaceutical Biochemistry,</li> <li>• Pharmaceutical Microbiology,</li> <li>• Pharmaceutical Quality Control &amp; Management,</li> <li>• Physiology &amp; Histology,</li> <li>• Application of Computer in Pharmacy.</li> </ul>
8.	114/2016	Physiotherapist (BS-17), Federal General Hospital, Chak Shehzad, Islamabad, Cabinet Division.	i. Second Class or Grade 'C' Master's Degree in Physiotherapy or equivalent qualification from a University/ Institute recognized by HEC. ii. 2 years post qualification experience in the relevant field	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>• Anatomy</li> <li>• Biochemistry</li> <li>• Community Medicine &amp; Sociology</li> <li>• Electrotherapy &amp; Actinotherapy</li> <li>• Kinesiology</li> <li>• Medical Physics</li> <li>• Physiotherapy Skills &amp; Techniques</li> <li>• Therapeutic Exercises &amp; Techniques</li> </ul>

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9.	117/2016	Assistant Private Secretary (BS-16), Ministry of Law, Justice and Human Rights	i. Second Class or Grade 'C' Bachelor's degree from a University recognized by HEC. ii. Minimum shorthand speed 100 W.P.M. and typing speed 50 W.P.M. iii. Must be computer literate.	<ul style="list-style-type: none"> <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>	50 Marks 50 Marks
10.	118/2016	Head Nurse (BS-17), Federal General Hospital, Chak Shehzad, Islamabad, Cabinet Division.	M.Sc. Nursing or equivalent qualification from a recognized university having 3 years practical experience as Charge Nurse with valid registration with PNC. <b>OR</b> B.Sc. Nursing post registered nurse having 4 years practical experience as Charge Nurse with valid registration with PNC. <b>OR</b> B.Sc. Nursing Generic with 5 years practical experience as Charge Nurse 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> Vocabulary, Grammar usage, Sentence Structuring <b>Part-II</b> <ul style="list-style-type: none"> <li>• Core Courses of <b>BSc.</b> Nursing Programme</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>
11.	119/2016	Assistant. Chief Administrative Officer (BS-17), Ministry of Defence, (Defence Division).	Second Class or Grade "C" Master's Degree in Business Administration/ Public Administration or equivalent from a University recognized by the 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>• Principles of Management</li> <li>• Organizational Behaviour</li> <li>• Production/Operations Management</li> <li>• Human Resource Management</li> <li>• Civil Servants Act, 1973 and Rules made thereunder</li> <li>• Rules of Business, 1973</li> <li>• New System of Financial Control and Budgeting</li> <li>• Principles of Secretariat Noting and Drafting</li> <li>• Public Procurement Rules, 2004</li> <li>• Basic Arithmetic,</li> <li>• Basic knowledge of Computer/IT.</li> </ul>
12.	120/2016	Civilian Medical Practitioner, (CMP), (BS-17), Ordnance Corps, Ministry of Defence.	MBBS or equivalent qualification recognized by the 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 Subjects of <b>MBBS</b> Programme</li> <li>• Health Policy of the Government.</li> <li>• Care Vs Cure for Health Management</li> </ul>

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13.	122/2016	Assistant Executive Engineer (Civil) (BS-17), PAK. PWD, Ministry of Housing & Works.	Bachelor's Degree in Engineering in Civil 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>• Building Material &amp; Building Construction,</li> <li>• Surveying &amp; Levelling,</li> <li>• Hydraulic &amp; Hydrology,</li> <li>• Soil Mechanics &amp; Foundation,</li> <li>• Concrete Technology &amp; R.C.C Structure Design,</li> <li>• Construction Management,</li> <li>• Structural Design Applications,</li> <li>• Engineering Materials,</li> <li>• Reinforced Concrete,</li> <li>• Ground Improvement,</li> <li>• Earth and Rock Structure.</li> </ul>
14.	124/2016	Lecturer (Mathematics) (Female) (BS-17) Directorate of Federal Government Educational Institutions (Cantts/ Garrisons), Ministry of Defence.	Second Class or Grade 'C' Master's Degree or equivalent qualification in Mathematics.	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>Part-I</b> Vocabulary, Grammar usage, Sentence Structuring. <b>Part-II (Masters Level)</b> <ul style="list-style-type: none"> <li>• Calculus/Differentiation, Integration, Limits of continuity</li> <li>• Discrete Structures/Discrete Mathematics,</li> <li>• Communication Skills for Mathematicians,</li> <li>• Computing Tools for Mathematicians,</li> <li>• Classical Mechanics,</li> <li>• Mathematical Statistics,</li> <li>• Real Analysis,</li> <li>• Mathematical Spaces (Sets, Vector Spaces, Metric Spaces, topological spaces Tensors,</li> <li>• Differential Equations.</li> </ul> <b>Part-III</b> <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>
15.	125/2016	Assistant Executive Engineer (Mechanical) (BS-17), MES, Ministry of Defence.	Bachelor's Degree in Mechanical Engineering 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>• 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 and Drilling</li> </ul>

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16.	127/2016	Assistant Executive Engineer (Civil) (BS-17), Civil Engineering Department of Pakistan Railways, (Railway Board), Ministry of Railways.	i. Bachelor's Degree in Civil 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>• Building Material &amp; Building Construction,</li> <li>• Surveying &amp; Levelling,</li> <li>• Hydraulic &amp; Hydrology,</li> <li>• Soil Mechanics &amp; Foundation,</li> <li>• Concrete Technology &amp; R.C.C Structure Design,</li> <li>• Construction Management,</li> <li>• Structural Design Applications,</li> <li>• Engineering Materials,</li> <li>• Reinforced Concrete,</li> <li>• Ground Improvement,</li> <li>• Earth and Rock Structure.</li> </ul>
17.	128/2016	Assistant Librarian (BS-16), PAK. PWD, Ministry of Housing and Works.	Second Class or Grade 'C' Bachelor's degree in Library Science from a University recognized by HEC. <b>OR</b> Second Class or Grade 'C' Bachelor's degree from recognized Institution by the HEC with one (01)year postgraduate diploma in 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>• Introduction to Library &amp; Information Science</li> <li>• Information Sources and Services</li> <li>• Classification: Theory and Practice</li> <li>• Cataloguing: Theory and Practice</li> <li>• Procurement and Maintenance of Library Books</li> <li>• Management of Libraries &amp; Information Centres</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 of Write off the Library Losses</li> </ul>
18.	130/2016	Assistant Private Secretary (BS-16), Federal Public Service Commission.	i. Second Class or Grade 'C' Bachelor's degree from a University recognized by HEC. ii. Minimum shorthand speed 100 W.P.M. and typing speed 50 W.P.M. iii. Must be computer literate.	<ul style="list-style-type: none"> <li>• Typing Test with minimum Speed of 50 W.P.M 50 Marks</li> <li>• Shorthand Test with minimum Speed of 100 W.P.M 50 Marks</li> </ul>	
19.	132/2016	Assistant Private Secretary (BS-16), Director General's Office, Pak PWD, Ministry of Housing & Works.	i. Second Class or Grade 'C' Bachelor's degree from a University recognized by HEC. ii. Minimum shorthand speed 100 W.P.M. and typing speed 50 W.P.M. iii. Must be computer literate.	<ul style="list-style-type: none"> <li>• Typing Test with minimum Speed of 50 W.P.M 50 Marks</li> <li>• Shorthand Test with minimum Speed of 100 W.P.M 50 Marks</li> </ul>	

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20.	133/2016	Assistant Geophysicist (BS-17), Geological Survey of Pakistan, Ministry of Petroleum and Natural Resources.	Second Class or Grade 'C' M.Sc. degree in Geophysics or in Geology with specialization in Geophysics OR Second Class or Grade 'C' M.Sc. degree in Physics with Geology and Mathematics as subjects in B.Sc. course or equivalent qualification from a University recognized by the HEC.	Objective Type Test (MCQ)  <u>Part-I</u>  English =20 marks  <u>Part-II</u>  Professional Test=80 marks	<u>Part-I</u> Vocabulary, Grammar Usage, Sentence Structuring <u>Part-II</u> <ul style="list-style-type: none"> <li>• Basic Geology</li> <li>• Basic Geochemistry</li> <li>• Structural Geology</li> <li>• Gravity Survey</li> <li>• Magnetic Survey</li> <li>• Seismic Survey (Refraction &amp; Reflection)</li> <li>• Electrical Methods</li> <li>• Geophysical Bore hole Logging</li> <li>• Radioactive Survey</li> <li>• Earthquake Seismology</li> </ul>

**Schemes and Syllabi for Written Examination (Descriptive)  
for All Posts in BS-18 & BS-19 included in Consolidated  
Advertisement No. 05/2016**

**PAPER-I: ENGLISH**

Max Marks: 100

Time Allowed: 3 Hours

- (i) **English Essay-50 Marks:** Candidates will be required to write an Essay in English comprising **1500 words** from a set of **six given topics**. Candidates are expected to reflect comprehensive and research based knowledge on a selected topic. Candidate's articulation, expression and technical approach to the style of English Essay writing will be examined.

- (ii) **English (Composition and Précis)-50 Marks:**

The examination will test the candidate's abilities to handle Précis Writing, Reading Comprehension, Sentence Structuring, Translation, Grammar and Vocabulary, etc.

**Précis Writing (10 marks):** A selected passage with an orientation of generic understanding and enough flexibility for compression shall be given for précising and suggesting an appropriate title.

**Reading Comprehension (10 marks)**

A selected passage that is rich in substance but not very technical or discipline-specific shall be given, followed by five questions, each carrying 2 marks.

**Grammar and Vocabulary (10 marks):** Correct usage of Tense, Articles, Prepositions, Conjunctions, Punctuation, Phrasal Verbs, Synonyms and Antonyms etc.

**Sentence Correction (5 marks):** Ten sentences shall be given each having a clear structural flaw in terms of grammar or punctuation. The candidates shall be asked to rewrite them with really needed correction only, without marking unnecessary alterations. No two or more sentences should have exactly the same problem, and 2-3 sentences shall be based on correction of punctuation marks.

**Grouping of Words (5 marks):** A random list of ten words of moderate standard (neither very easy nor utterly unfamiliar) shall be given, to be grouped by the candidates in pairs of those having similar or opposite meaning, as may be clearly directed in the question.

**Pairs of Words (5 marks):** Five pairs shall be given of seemingly similar words with different meanings, generally confused in communication, for bringing out the difference in meaning of any five of them by first explaining them in parenthesis and then using them in sentences.

**Translation (5 marks):** Ten short Urdu sentences involving structural composition, significant terms and figurative/idiomatic expressions shall be given, to be accurately translated in English.

**SUGGESTED READINGS**

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



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

Case No.	F.4-66/2016-R
Particulars of post	Principal (BS-18), F.G. English Medium (Public Schools), Directorate of Federal Government Educational Institutions (Cantt/ 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.4-100/2016-R
Particulars of post	Director (BS-19), Board of Investment, Prime Minister's Office
Minimum Qualification & Experience:	<p>i. Second Class or Grade 'C' Master's Degree or equivalent in one of the following subject: Economics/ Commerce/ Business Administration/ Public Administration/ Physics/ Chemistry/ International Relations/ Chemicals/ Electronics / Mechanical Engineering.</p> <p>ii. Twelve (12) years post qualification experience in BS-17 and above or equivalent in Industrial Production/ Financial and Economic Analysis of Investment proposals/ Marketing, Management Development/ Economic Policy and Planning/ Industrial Policy Investment Promotion in Commercial/ Industrial Government/ Semi- Government Organizations/ Private firms of repute.</p>

**Part-I: 50 Marks**

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

**I. Human Resource and Financial Management**

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

**II. Basic Concept of Quality Management**

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

**III. Information Technology and MS Office**

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

**Part-II: 50 Marks**  
(Job Oriented)

**I. Public Policy Formulation and Implementation**

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

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

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

**SUGGESTED READINGS**

S. No.	Titles	Author
1.	Human Resource Management	H.T. Graham & Roger Bennett
2.	Management	James A.F. Stoner, R. 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.	Implementing Public Policy: Governance in Theory and in Practice.	Hill M. and Hupe P.
7.	Governance, Economic Policy and Reform in Pakistan	Abdus Samad
8.	Public Policy: Politics, Analysis, and Alternatives, 4th Ed., CQ Press, 2012	Kraft, Michael E., Scott R. Furlong
9.	Pakistan Economic Survey 2014-15	Finance Division
10.	Relevant Rules, Acts, Ordinance and course contents mentioned in Part-II	

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

Case No.	F.4-105/2016-R
Particulars of post	Assistant Chief (BS-18), Water Resources Section, Ministry of Planning, Development and Reform.
Minimum Qualification & Experience:	<ul style="list-style-type: none"> <li>i. Second Class Bachelor's Degree or equivalent qualifications in Civil Engineering or Agricultural Engineering.</li> <li>ii. Three (3) years post qualification experience of operation, maintenance, drainage or research or planning relating to irrigation, drainage or flood control works of similar matters.</li> </ul>

**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) Cost Management**

Quality Planning, Staff Acquisition and Team Development.

**e) Communications Management**

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

**f) Risk Management**

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

**g) Procurement Management**

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

**h) Closing**

Administrative Closure, Contract Close-Out and Lessons Learnt.

**i) Lab Work**

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

**j) 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 cost of flood protection.

**SUGGESTED READINGS**

<b>S. No.</b>	<b>Title</b>	<b>Author</b>
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 Yorkey
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 Scharon.
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.

<b>S. No.</b>	<b>Title</b>	<b>Author</b>
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.4-106/2016-R
Particulars of post	Deputy Director (BS-18), Directorate of Dock Workers Safety, (Regional Office) GWADAR, 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. Five (5) years post qualification experience in testing 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: 50 Marks  
(Engineering)****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, Difference between Engineering and 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/ step-down 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.



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

**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

**IV. Laws about Ports and Shipping**

Labour Laws, Dock Labourers Act, Pakistan Dock Labourers Regulations

**SUGGESTED READINGS**

S. No.	Title	Author
1.	Fluid mechanics with engineering applications	Finnemore/ Franzini.
2.	Schaum Outline Series; Strength of Materials	Williym A. Nash
3.	Fluid Mechanics	Lewitt
4.	Manufacturing Processes for Engineering Materials	Kalpakgjian
5.	Electrical Technology	B.L. Tharaja
6.	Electronic Devices and Circuits.	Bogart
7.	DC Machines	P.C. Sen
8.	Semiconductors	Manzar Saeed
9.	Human Resource Management	H.T.Graham & Roger Bennett
10.	Management	James A.F.Stoner, R.Eward Freeman, Daniel R.Gilbert Jr.
11.	Understanding Computer: Today and Tomorrow	Deborah Morley, Charles Parker
12.	MS Office 365 Handbook: 2013 Edition	Kevin Wilson

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

Case No.	F.4-108/2016-R
Particulars of post	Physician (General Medicine) (BS-19), Federal General Hospital, Chak Shahzad Islamabad, Cabinet Division.
Minimum Qualification & Experience:	i. MBBS degree recognized by PM&DC. ii. Postgraduate higher diploma in the relevant field recognized by PM&DC with 7 years post graduate experience. <b>OR</b> Postgraduate lower diploma in the relevant field recognized by PM&DC with 10 years post graduate experience.

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

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

Case No.	F.4-109/2016-R
Particulars of post	Associate Anesthetist (BS-18), Federal General Hospital, Chak Shahzad Islamabad, Cabinet Division.
Minimum Qualification & Experience:	i. MBBS degree recognized by PM&DC. ii. Postgraduate higher diploma in the relevant field recognized by PM&DC with 3 years post graduate experience. <b>OR</b> Postgraduate lower diploma in the relevant field recognized by PM&DC with 5 years post graduate experience.

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

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

Case No.	F.4-110/2016-R
Particulars of post	Associate Physician (PEADS) (BS-18), Federal General Hospital, Chak Shahzad Islamabad, Cabinet Division.
Minimum Qualification & Experience:	i. MBBS degree recognized by PM&DC. ii. Postgraduate higher diploma in the relevant field recognized by PM&DC with 3 years post graduate experience. <b>OR</b> Postgraduate lower diploma in the relevant field recognized by PM&DC with 5 years post graduate experience.

**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.4-111/2016-R
Particulars of post	Associate Radiologist (BS-18), Federal General Hospital, Chak Shahzad Islamabad, Cabinet Division.
Minimum Qualification & Experience:	i. MBBS degree recognized by PM&DC. ii. Postgraduate higher diploma in the relevant field recognized by PM&DC with 3 years post graduate experience. <b>OR</b> Postgraduate lower diploma in the relevant field recognized by PM&DC with 5 years post graduate experience.

**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**.

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

Case No.	F.4-112/2016-R
Particulars of post	Associate Surgeon (Eye) (BS-18), Federal General Hospital, Chak Shahzad Islamabad, Cabinet Division.
Minimum Qualification & Experience:	i. MBBS degree recognized by PM&DC. ii. Postgraduate higher diploma in the relevant field recognized by PM&DC with 3 years post graduate experience. <b>OR</b> Postgraduate lower diploma in the relevant field recognized by PM&DC with 5 years post graduate experience.

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

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

Case No.	F.4-115/2016-R
Particulars of post	Deputy Director (Medical) (BS-18), Federal General Hospital, Chak Shahzad Islamabad, Cabinet Division.
Minimum Qualification & Experience:	<p>i. MBBS degree recognized by PM&amp;DC.</p> <p>ii. Postgraduate higher diploma in Public Health/Health Services Administration recognized by PM&amp;DC with 3 years post graduate experience.</p> <p style="text-align: center;"><b>OR</b></p> <p>Postgraduate lower diploma in Public Health/Health Services Administration recognized by PM&amp;DC with 5 years post graduate experience.</p>

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

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

Case No.	F.4-116/2016-R
Particulars of post	Physician Psychiatry (BS-19), Federal Government Polyclinic, Capital Administration and Development Division.
Minimum Qualification & Experience:	<p>i. MBBS or equivalent qualification recognized by Pakistan Medical and Dental Council.</p> <p>ii. Postgraduate higher diploma in the requisite speciality with 7 years clinical experience in the requisite speciality.</p> <p style="text-align: center;"><b>OR</b></p> <p>Postgraduate lower diploma in the requisite speciality with 10 years post qualification clinical experience in the requisite speciality.</p>

**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**.



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

Case No.	F.4-121/2016-R
Particulars of post	Deputy Captain Superintendent (BS-19), Pakistan Marine Academy, Ministry of Ports and Shipping
Minimum Qualification & Experience:	i. Certificate of Competency as Master Foreign Going or equivalent Naval qualifications. ii. Two (2) years experience in Training Establishment for sailors or equal number of Sea Service in the Rank

**Part-I: 20 Marks**  
(Basic Concepts only)

- I. Public Administration
- II. Human Resource Management
- III. Financial Management
- IV. Information Technology and MS Office

**Part-II: 80 Marks**  
(Professional)

- I. Course Contents of Certificate of Competency as **Master Foreign Going Ships**.
- II. Pakistan Merchant Shipping Ordinance, 2001
- III. Mercantile Shipping (Safety Convention Certificate) Rules 1967.
- IV. Port Act 1908 (Relevant Portion)
- V. Lighthouse Act 1927

**SUGGESTED READINGS**

S. No.	Title	Author
1.	An Introduction to the Public Administration	E.N.Cladden
2.	Human Resource Management	H.T.Graham & Roger Bennett
3.	System of Financial Control and Budgeting, 2006	Published by Finance Division
4.	Understanding Computers: Today and Tomorrow	Deborah Morley, Charles Parker
5.	MS Office 365 Handbook: 2013 Edition	Kevin Wilson
6.	Relevant Rules, Acts, Ordinance and course contents mentioned in Part-II	

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

Case No.	F.4-126-A/2016-R
Particulars of post	Assistant Professor (Male) ( <b>Mathematics</b> ) (BS-18) Federal Government Educational Institutions (FGEI) (Cantts/ Garrisons), Ministry of Defence.
Minimum Qualification & Experience:	Ph.D. Degree in the relevant subject with one year (1) 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 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.
- 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.	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.4-126-B/2016-R
Particulars of post	Assistant Professor (Male) ( <b>Health and Physical Education</b> ) (BS-18) Federal Government Educational Institutions (FGEI) (Cantts/ Garrisons), Ministry of Defence.
Minimum Qualification & Experience:	Ph.D. Degree in the relevant subject with one year (1) 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 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.
- 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.	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.4-126-C/2016-R
Particulars of post	Assistant Professor (Male) ( <b>Political Science</b> ) (BS-18) Federal Government Educational Institutions (FGEI) (Cantts/ Garrisons), Ministry of Defence.
Minimum Qualification & Experience:	Ph.D. Degree in the relevant subject with one year (1) 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 with five (5) year 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

S. No.	Title	Author
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.4-126-D/2016-R
Particulars of post	Assistant Professor (Male) ( <b>History</b> ) (BS-18), Federal Government Educational Institutions (FGEI) (Cantts/ Garrisons), Ministry of Defence.
Minimum Qualification & Experience:	Ph.D. Degree in the relevant subject with one year (1) 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 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 Conferences. 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 Firoz 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.
  - 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.	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.4-126-E/2016-R
Particulars of post	Assistant Professor (Male) ( <b>Economics</b> ) (BS-18) Federal Government Educational Institutions (FGEI) (Cantts/ Garrisons), Ministry of Defence.
Minimum Qualification & Experience:	Ph.D. Degree in the relevant subject with one year (1) 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 with five (5) year post qualification teaching experience at College/ University level.

**Part-I: (Economics)****50 Marks****I. Micro Economics**

Consumer behaviour, Determination of market demand and supply i.e. concept of elasticity of Demand & Supply, Static, Comparative Static Analysis, Distinction between partial and general equilibrium analysis (basic level) theory of the Firm, Producer's equilibrium, Pricing factors of production

**II. Macro Economics**

Basic Economic Concepts, National Income Accounting, Consumption Function, Multiplier, Accelerator, Component of Aggregate Demand, Labour Demand and Supply, Un-Employment, Determination of equilibrium level of income and output (at least with reference to two or three school of thought), Inflation.

**III. Public Financing**

Government expenditure, Sources of Government Revenue, Privatization, Taxes and non-taxes, Incidence of different taxes, Public Debt, Objectives, methods of repayment, Deficit financing, General Equilibrium Analysis, Welfare Economics, Fiscal Policy.

**IV. Role of Foreign Trade and Aid in Economic Development**

Trends in Pakistan's Balance of Payments, Terms of Trade, Changes in direction of trade, Trends in Pakistan's major exports and imports, Causes of significant changes in the trends, the role of migration and remittances in Pakistan's economy, costs and benefits of Foreign Aid, Role of Foreign Investment.

**V. Major Issues in Pakistan Economy**

Energy crisis, Corruption, Bad governance, External debt accumulation and dependency, Unemployment, Income inequality, Inflation, Fiscal and trade deficits, Balance of payment issues, Shortage of irrigation water.

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

- Elements of Curriculum.
- Relationship of Education and Curriculum

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

## II. Process of Teaching and Teaching Strategies

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

## III. Educational Assessment and Evaluation

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

## IV. Educational Administration and Supervision

- The Concept of Administration
- Educational Planning and Organization in Pakistan
- Approaches to Educational Administration: Democratic; Authoritarian; Laissez-faire
- Educational Supervision

## V. Research Methods in Education

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

### SUGGESTED READINGS

S. No.	Title	Author
1.	A Text-book of Economics Theory	Stonier & Hague
2.	Government Finance—An Economic Analysis	Due John, F.
3.	Microeconomic	Ferguson, C.E. & Gould, J.P., Nicholson, Mankiw
4.	Macroeconomics	Rudigar Dorubush and Stanley Fisher Blanchard
5.	Foreign Aid Theory and Practice in Southern Asia	Wolf, Jr. DC
6.	History of International Trade	Findlay, R and O' Rourke, K
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.4-129/2016-R
Particulars of post	Associate Dental Surgeon (BS-18), Federal Government Polyclinic, Capital Administration and Development Division.
Minimum Qualification & Experience:	i. BDS or Equivalent qualification recognized by PMDC. ii. Postgraduate higher diploma in the requisite speciality with three (3) years post qualification Clinical experience in the speciality.  <b>OR</b>  Postgraduate lower diploma with five (5) years post qualification clinical experience in the speciality.

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

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

Case No.	F.4-131/2016-R
Particulars of post	Chief Librarian (BS-19), Directorate General of Special Education, Capital Administration and Development Division.
Minimum Qualification & Experience:	i. Second Class or Grade 'C' Master's degree in Library Science/ Information Sciences/Documentation. ii. Twelve (12) years post qualification experience in BS-17 and above or equivalent 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. Kaliaammal & 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.4-134/2016-R
Particulars of post	Deputy Chief (Transport) (BS-19), National Energy Conservation Centre (ENERCON), Ministry of Water and Power.
Minimum Qualification & Experience:	<p>i. Second Class or Grade 'C' Bachelor's degree in Mechanical or Transport Engineering or equivalent from a University recognized by the HEC.</p> <p>ii. Twelve (12) years post qualification experience in the relevant field with atleast three (3) years in Transport Energy Conservation programmes.</p>

**Engineering: 100 Marks****I. 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.

**II. 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, Difference between Engineering and 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.

**III. Environmental Engineering:**

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

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

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

**V. Project Management:**

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



**VI. Inventory Management:**

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

**VII. Quality Management Systems:**

QA models. 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.	Transportation Engineering, Planning and design	Paul Wright.
2.	Public Health Engineering	STEEL.
3.	Engineering Mechanics (Statics)	J.L. Merriems.
4.	Manufacturing Processes for Engineering Materials	Kalpakjian
5.	Environmental Science: Earth as a living Planet, 9 <sup>th</sup> ed.	Botkin, D . Keller, E. 2014
6.	Handbook of Engineering Management	Dennis Lock.
7.	Total Quality Management	Dale H. Besterfield, Carol Besterfield-Michna, Glen H. Besterfield, Mary Gesterfield-Sacre