

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. 02/2021

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
1.	21/2021	Assistant District Attorney (BS-17), Office of District Attorney (ICT), Ministry of Interior.	Law Graduate with atleast Three (3) years post qualification experience as an Advocate/ Dealing with Legal Matters.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test =80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring Part-II <ul style="list-style-type: none"> • Code of Civil Procedure 1908 • Steps involved in Processing of Legal Cases • Pakistan Penal Code 1860 • The Code of Criminal Procedure, 1898 • The Qanoon-e-Shahadat, 1984
2.	22/2021	Industrial Development Officer (BS-16), ICT Administration, Ministry of Interior.	i. Degree in Mechanical/ Electrical Engineering. ii. Registration with PEC OR Second Class or Grade 'C' Bachelor's degree in Chemistry/ Physics/ Economics/ Commerce with three (3) years post qualification experience in the relevant field.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test =80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring Part-II <ul style="list-style-type: none"> • General Principles of Management • Human Resource Planning, • Recruitment & Selection, • System of Financial Control and Budgeting, 2006 • Public Procurement Rules, 2004 • Basic IT knowledge.
3.	23/2021	Deputy Assistant Director (BS-16), Directorate General Immigration & Passports, Ministry of Interior.	i. Bachelor's Degree. ii. Three (3) years post qualification administrative experience in a Government/ Semi Government/ Autonomous Organization.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II General Knowledge = 40 marks Part-III Job Oriented Test = 40 marks	Part-I Vocabulary, Grammar usage. Part-II <ul style="list-style-type: none"> • General Knowledge, • Current Affairs. <ul style="list-style-type: none"> – Developments at National and International Levels in the last 2 years • Everyday Science. Part-III <ul style="list-style-type: none"> • Immigration, Prevention & Control Human Trafficking Ordinance 2002, • Passport Act, 1974, • Passport Rules, 1974

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4.	24/2021	Assistant Director (BS-17), Directorate General Immigration & Passports, Ministry of Interior.	i. Second Class or Grade 'C' Master's degree. ii. Two (2) years post qualification Administrative experience in a Government/ Semi Government/ Autonomous Organization.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II General Knowledge = 40 marks Part-III Job Oriented Test = 40 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • General Knowledge, • Current Affairs. <ul style="list-style-type: none"> – Developments at National and International Levels in the last 2 years • Everyday Science, Part-III <ul style="list-style-type: none"> • Immigration, Prevention & Control Human Trafficking Ordinance 2002, • Passport Act, 1974, • Passport Rules, 1974 • Pakistan Citizenship Act 1951 • Public Procurement Rules, 2004
5.	25/2021	District Food Controller (BS-16), Chief Commissioner's Office (ICT), Ministry of Interior.	Second Class or Grade 'C' Bachelor's degree or equivalent qualification in Commerce / Economics/ Statistics/ Business Administration from a University recognized by HEC.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test =80 marks	Part-I Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • General Knowledge, • Everyday Science • Basic Arithmetic <ul style="list-style-type: none"> – Algebra – Ratios – Percentages – Arithmetic Means • Current Affairs. <ul style="list-style-type: none"> – Developments at National and International Levels in the last 2 years • Issues related to food security in Pakistan

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6.	26/2021	Assistant Director Food (BS-17), ICT Administration Ministry of Interior.	Second Class or Grade 'C' Master's degree or equivalent qualifications in Commerce/ Economics/ Statistics / Business Administration from a recognized University by HEC.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test =80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • General Knowledge, • Everyday Science • Basic Arithmetic <ul style="list-style-type: none"> – Algebra – Ratios – Percentages – Arithmetic Means • Current Affairs. <ul style="list-style-type: none"> – Developments at National and International Levels in the last 2 years • Food Procurement in Pakistan • Sustainable Development Goal No. 02. • Public Procurement Rules, 2004
7.	27/2021	Assistant Public Relation Officer (BS-16), Chief Commissioner's Office (ICT), Ministry of Interior.	Second Class Grade 'C' Master's degree in Journalism from a University recognized by HEC. OR i. Second Class or Grade 'C' Bachelor's degree from a University recognized by HEC. ii. Two (2) years post qualification experience in the field of Journalism or Public Relations.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test =80 marks	Part-I Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • Basic knowledge of computer/IT , • Pros and Cons of Social Media • Press laws in Pakistan • Newsprint Control Ordinance 1971 • Advertisement and Public Policy • Code of Ethics • Communication theories of social change • Newspaper Employees (Condition of service) Act 1973 • PEMRA Ordinance, 2007
8.	28/2021	Assistant Deputy District Prosecutor (BS-17), Prosecution Department ICT, Ministry of Interior.	Second Class or Grade 'C' Bachelor's Degree in Law or equivalent qualification from a University recognized by HEC.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II Professional Test=80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • Steps involved in Processing of Legal Cases • Pakistan Penal Code 1860 • The Code of Civil Procedure 1908 • Qanun-e-Shahadat Order, 1984 • Criminal Procedure Code, 1898

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9.	31/2021	Protocol Officer (BS-16), Pakistan National Commission for UNESCO, Ministry of Federal Education & Professional Training.	Second Class or Grade 'C' Bachelor's degree with two (2) years post qualification experience in the field of Protocol/ PRO.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test =80 marks	Part-I Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • General Knowledge, • Everyday Science • Basic Arithmetic <ul style="list-style-type: none"> – Algebra – Ratios – Percentages – Arithmetic Means • Current Affairs. <ul style="list-style-type: none"> – Developments at National and International Levels in the last 2 years • Techniques of Public Relations • Use of MS Office
10.	32/2021	Accountant (BS-16), Pakistan National Commission for UNESCO, Ministry of Federal Education & Professional Training.	i. Second Class or Grade 'C' Bachelor's degree in Commerce or equivalent qualification from a University recognized by the HEC. ii. Two (2) years post qualification experience in the field of Accounting/ Auditing. OR Second Class or Grade 'C' Master's degree in Commerce/MBA (Finance).	Objective Type Test (MCQ) Part-I English = 20 marks Part-II Professional Test=80 Marks	Part-I Grammar Usage, Sentence Structuring Part-II <ul style="list-style-type: none"> • Accounting Principles & Procedures, • Scrutiny of Record for Audit Purposes, • Journal, Ledger & Cash Book, • Preparation of Annual Budget, • Adjustment & Depreciation, • Financial Planning & Cost Accounting, • Heads of Account, Re-appropriation of Funds and Supplementary Grant, • Public Procurement Rules, 2004
11.	33/2021	Assistant Secretary General (BS-17), Pakistan National Commission for UNESCO, Ministry of Federal Education & Professional Training.	i. Second Class or Grade 'C' Master's degree or equivalent qualification from a University recognized by HEC. ii. Two (2) years post qualification experience in the field of Education/ Culture Administration/ Research/ Training/ Planning and Management.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test =80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • General Principles of Management • Human Resource Planning, • Recruitment & Selection, • Rules of Business, 1973 • Basic IT knowledge. • System of Financial Control and Budgeting, 2006 • Public Procurement Rules, 2004

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12.	34/2021	<p>Lecturer (Female) (BS-17)</p> <p>A. Applied Psychology B. Botany C. Chemistry D. Computer Science E. Economics F. English G. History H. Islamic Studies I. Mathematics J. Pakistan Studies K. Physics L. Political Science M. Sociology N. Statistics O. Urdu P. Zoology</p> <p>EX- F.G Colleges, Federal Directorate of Education, Islamabad, Ministry of Federal Education and Professional Training.</p>	<p>Second Class or Grade "C" Master's degree or equivalent in the relevant subject.</p>	<p>Objective Type Test (MCQ)</p> <p>Part-I English = 20 marks</p> <p>Part-II Subject Test = 50 marks</p> <p>Part-III Professional Test = 30 marks</p> <p>Note:</p> <ul style="list-style-type: none"> ▪ In Language Subjects (i.e Urdu and English), English part for 20 marks will not be included. There will be 70% subject Test and 30% Professional Test. ▪ In all other subjects there will be English (20 marks), Subject Test (50 marks) and Professional Test (30 marks) 	<p>A. For Applied Psychology</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring</p> <p>Part-II (Masters Level)</p> <ul style="list-style-type: none"> • Nature and Scope of Psychology • Developmental Psychology • Social Psychology • Educational Psychology • Counselling Psychology • Abnormal and Clinical Psychology • Organizational/Industrial Psychology • Forensic Psychology • Psychological Testing and Assessment • Research Methodology <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation <hr/> <p>B. For Botany</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring.</p> <p>Part-II (Masters Level)</p> <ul style="list-style-type: none"> • Algae, • Fungi, • Bryophytes • Pteridophytes • Gymnosperms, • Angiosperms, • Plant Physiology, • Ecology, • Cytology, • Genetics, <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation

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					<p>C. For Chemistry</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring</p> <p>Part-II (Master's Level)</p> <ul style="list-style-type: none"> • Chemical Kinetics, • Chemical Equilibrium, • Quantum Theory of Atom, • Synthetic Chemistry & Polymers, • Reaction Mechanism, • Green Chemistry, • Spectroscopy, • Nano Technology, • Colloidal State. <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation <p>D. For Computer Science</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring</p> <p>Part-II (Masters Level)</p> <ul style="list-style-type: none"> • Computer Hardware/Software, • Data Communication & Networking, • C/C++ Language, • Visual Basic, • Operating System Unix/Linux • Windows XP, 2000, • Oracle/PLSQL, • System Analysis & Design. • Web Programming, <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology, • Classroom Management and Discipline, • Testing and Evaluation,

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					<p>E. <u>For Economics</u></p> <p><u>Part-I</u> Vocabulary, Grammar Usage, Sentence Structuring.</p> <p><u>Part-II (Masters Level)</u></p> <ul style="list-style-type: none"> • Micro Economics: Meaning, Scarcity and Opportunity Cost. • Goals of Microeconomics Policy: Efficiency & equity • Macro Economics: Basic Economic Concepts • The theory of Factor Pricing • Monetary Theory & Public Finance, • Industrial Development in Pakistan • Interest Free Banking in Pakistan • Basic Statistics on Economy of Pakistan <p><u>Part-III</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation
					<p>F. <u>For English</u></p> <p><u>Part-I (Master's Level) (70 Marks)</u></p> <ul style="list-style-type: none"> • Vocabulary • Structuring of sentences. • Linguistics. • Grammar. • Syntax. • Diction. • Drama: Shakespeare (Hamlet; King Lear; Twelfth Night), William Congreve (The Way of the World), Shaw (Pygmalion; Heartbreak House), Harold Pinter (The Caretaker), Samuel Beckett (Waiting for Godot), Eugene O'Neill (Long Day's Journey into Night) <p><u>Part-II (30 Marks)</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology, • Classroom Management and Discipline, • Testing and Evaluation,

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					<p>G. For History</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring</p> <p>Part-II (Masters Level)</p> <ul style="list-style-type: none"> • The Prophetic Age (570-632) • The Pious Caliphate (632-660) • Political System of Islam under the Prophet (PBUH) and the Pious Caliphate • Institutional Development of the Muslim Civilisation (Umayyad, Abbasid, Crusades, Ottoman Empire) • Muslim Freedom Movement in India (1857-1947) • Ideology of Pakistan • The Kashmir Issue • Pakistan and Neighbouring Countries • Research Methodology & Philosophy of History <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation
					<p>H. For Islamic Studies</p> <p>Vocabulary, Grammar Usage, Sentence Structuring</p> <p>Part-II (Masters Level)</p> <p>قرآن کا بنیادی موضوع / متن ☆</p> <p>سیرت النبی ﷺ ☆</p> <p>فقہ: جامعیت، اختلاف رائے اور عصر حاضر کے تناظر میں مذہب کی تشریح۔ ☆</p> <p>تعارف اسلام ☆</p> <p>انسانی زندگی میں دین کی اہمیت ☆</p> <p>اسلام کے نمایاں پہلو ☆</p> <p>اسلامی عقائد کے انفرادی اور اجتماعی اثرات ☆</p> <p>انسانی حقوق۔ اسلام کی نظر میں ☆</p> <p>اسلام اور عصر حاضر کے چیلنجز ☆</p> <p>اسلامی نظام حکمرانی کا ڈھانچہ ☆</p> <p>سرکاری ملازمین کی ذمہ داریاں ☆</p> <p>اسلامی ضابطہ حیات ☆</p> <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation

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					<p>I. <u>For Mathematics</u></p> <p><u>Part-I</u> Vocabulary, Grammar Usage, Sentence Structuring.</p> <p><u>Part-II (Masters Level)</u></p> <ul style="list-style-type: none"> • Calculus/Differentiation, Integration, Limits of continuity • General Theorems (Rolle's Theorem, Mean Value Theorem) • Areas and Volumes, centre of Mass • Computing Tools for Mathematicians, • Mathematical Statistics, • Mathematical Spaces (Sets, Vector Spaces, Metric Spaces, topological spaces Tensors, • Differential Equations. <p><u>Part-III</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation <p>J. <u>For Pakistan Studies</u></p> <p><u>Part-I</u> Vocabulary, Grammar Usage, Sentence Structuring.</p> <p><u>Part-II (Masters Level)</u></p> <ul style="list-style-type: none"> • Ideology of Pakistan in light of speeches and statements of Allama Iqbal and Quaid-e-Azam • Pakistan Movement 1857-1947 • Current Issues of Pakistan (challenges to National Security, Economic Challenges, Pakistan's War on Terror, • Geography of Pakistan <ul style="list-style-type: none"> ✓ Land and People of Pakistan ✓ Pakistan and CPEC ✓ Natural Resources of Pakistan, • Latest Constitutional Amendments, <p><u>Part-III</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation

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					<p>K. For Physics</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring</p> <p>Part-II (Masters Level)</p> <ul style="list-style-type: none"> • Mechanics • Heat and Thermodynamics, • Waves and Optics, • Electrostatic, • Electricity and Magnetism, • Modern and Quantum Physics, • Nuclear Physics, • Basic Solid State Physics, <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation <p>L. For Political Science</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring.</p> <p>Part-II (Masters Level)</p> <ul style="list-style-type: none"> • Western Political Thought (Plato, Aristotle, Machiavelli, Montesquieu, Hobbes, Locke, Rousseau, Marx, Lenin, Frances Fukuyama) • Muslim Political Thought (Al-Farabi, Al-Mawardi, Imam Ghazali, Ibn Khaldun, Shah Waliullah, Allama Muhammad Iqbal) • State System: Nature and Emergence, Islamic Concept • Political Institutions and Role of Government • Basic concepts of Political Ideologies (Capitalism, Marxism, Communism/Socialism, Fascims, Nationalism, Islamic Political Ideology) • Government and Politics in Pakistan: Analysis of 1956, 1962, 1973 Constitutions and Constitutional Amendments • Comparative Study of Political System (Turkey, India, Malaysia and China) <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation

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					<p><u>M. For Sociology</u></p> <p><u>Part-I</u> Vocabulary, Grammar Usage, Sentence Structuring</p> <p><u>Part-II (Masters Level)</u></p> <ul style="list-style-type: none"> • Meaning, Characteristics and Elements of Culture • Society: Meaning and Characteristics • Social Contract Theory & Organismic Theory • Sociological Theories (Ibn-i-Khaldun, Spencer, Max Weber, Karl Marx) • Methods of Sociological Research, • Social Institutions: Nature, Genesis & Function • Mechanism of Social Control: Formal & Informal • Social and Cultural Change & Social Policy: Processes & Effects • Community organization and development • Social Problems in Pakistan <p><u>Part-III</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology, • Classroom Management and Discipline, • Testing and Evaluation, <p><u>N. For Statistics</u></p> <p><u>Part-I</u> Vocabulary, Grammar Usage, Sentence Structuring.</p> <p><u>Part-II (Masters Level)</u></p> <ul style="list-style-type: none"> • Measures of Central Tendency, • Measures of Dispersion or Variation, • Regression and Correlation, • Index Numbers, • Probability Theory, • Probability Distributions, • Presentation of Data • Time Series Analysis, • Statistical Inference, • Sampling Theory and Techniques, • Analysis of Variance, • Experimental Design <p><u>Part-III</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation

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					<p>O. For Urdu Part-I (Master's Level) (70 Marks)</p> <p style="text-align: right;"> ☆ اردو ڈیڑھ الفاظ ☆ ☆ اردو جملے کا ڈھانچہ ☆ ☆ اردو قواعد کا استعمال ☆ ☆ غالبیات ☆ ☆ اقبالیات ☆ ☆ مسدس حالی ☆ ☆ میر تقی میر کی شاعری ☆ ☆ طنز و مزاح: مشتاق احمد یوسفی کی نظر میں ☆</p> <p>Part-II (30 Marks)</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology, • Classroom Management and Discipline, • Testing and Evaluation,
					<p>P. For Zoology Part-I Vocabulary, Grammar Usage, Sentence Structuring Part-II (Masters Level)</p> <ul style="list-style-type: none"> • Eco System, • Classification of Fish, Reptiles, Mammals, • Classification of Mollusks, Edinodermata, • Theories of Evolution, • Mammalian Hormonal System, • Membrane System, • Mammalian Gametogenesis and Fertilization, • Multiple Alleles. • Mendelian laws of inheritance, • Reproduction and Development, <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology, • Classroom Management and Discipline, • Testing and Evaluation,

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13.	36/2021	Assistant Security Officer (BS-16), MVRDE, Ministry of Defence Production.	Retired/ Released Officers of the Armed Forces including JCOs holding Honorary Commission in the Rank of Lieutenant/ Captain.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test =80 marks	Part-I Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • Official Secret Act, 1923 • Classification of Security • Classification and treatment of Protected documents • Cyber Security • Army Regulations (Instructions) • General Security/Emergency Drills • Use of MS Office
14.	37/2021	Veterinary Officer (BS-17) Remount Veterinary & Farms Directorate, GHQ, Ministry of Defence.	Veterinary Graduate. (Registration with Pakistan Veterinary Medical Council).	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test=80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring Part-II <ul style="list-style-type: none"> • Veterinary Pathology, • Veterinary Parasitology, • Veterinary Microbiology, • Animal Nutrition, • Animal Breeding & Genetics, • Livestock Management, • Poultry Husbandry, • Animal Reproduction, • Infectious Diseases of Bovines & Poultry.
15.	38/2021	Database Administrator (BS-17), Office of the Attorney General for Pakistan, Ministry of Law and Justice.	Second Class or Grade 'C' Master's/ Bachelor's (04 years duration) degree in Computer Engineering or Software Engineering or System Engineering or Computer Science or Information Technology or equivalent qualification from a University recognized by HEC.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test=80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring Part-II <ul style="list-style-type: none"> • Introduction to Oracle Database and SQL overview • Modifying Information in Multiple Databases • Backup and Recovery • Managing Constraints and Indexes • Managing Tables and views • Managing Users and Security • Oracle Database Server Architecture

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16.	40/2021	Staff Officer-III (Stats) (BS-17), GHQ, Ministry of Defence.	i. Second Class or Grade 'C' or higher Master's degree in Statistics/ Economics or Mathematics with Statistics as a paper in Master's degree. ii. Two (2) years post qualification experience of Statistical/ Research work.	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"> • Introduction to Statistics and its application • Presentation and classification of data. • Measures of Central Tendency • Measures of Dispersion • Correlation and Regression • Index Numbers • Sampling • Time Series Analysis • Testing of Hypothesis • Research Methods & Techniques • Report Writing
17.	43/2021	Assistant Executive Engineer (Civil) (BS-17), PAK. PWD, Ministry of Housing and Works.	i. Bachelor's Degree in Civil Engineering from a recognized University. ii. Registration with PEC.	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"> • Building material & Building Construction, • Surveying & Levelling, • Hydraulic & Hydrology, • Concrete Technology & R.C.C Structure Design, • Construction Management, • Structural Design Applications, • Sewerage and Sewage Treatment, • Engineering Materials, • Reinforced Concrete, • Ground improvement,
18.	44/2021	Assistant Executive Engineer (E/M) (BS-17), PAK. PWD, Ministry of Housing and Works.	i. Bachelor's Degree in Engineering in Electrical/ Mechanical from a recognized University. ii. Registration with PEC.	Objective Type Test (MCQ) <u>Part-I</u> English = 20 marks <u>Part-II</u> Professional Test=80 marks Note: keeping in view two distinct disciplines of Engineering, two independent tests will be developed in Part-II of the paper.	<u>Part-I</u> Vocabulary, Grammar Usage, Sentence Structuring, <u>Part-II</u> For candidates with <u>Electrical Engineering</u> degree <ul style="list-style-type: none"> • Electric Circuits, • Semiconductor Devices, • Electrical Instrumentation, • Power Transmission, • Power System Operation and Control, • Power System Protection, • High Voltage Engineering, • Electrostatics, • Electronic System Design,

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					<p>For candidates with <u>Mechanical Engineering</u> degree</p> <ul style="list-style-type: none"> • Heat Transfer, • Thermodynamics, • Industrial Materials, • Machine Design and Drawing, • Mechanics of Machines, • Production Management & Quality control, • Workshop Technology, • Hydraulic Machines.
19.	46/2021	Assistant Director Hajj (BS-17), Directorate of Hajj, Ministry of Religious Affairs & Interfaith Harmony.	Second Class or Grade 'C' Master's degree with two (2) years post qualification experience in executive/administrative work.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test =80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • Definition & fundamentals of Hajj • General Principles of Management • Human Resource Planning, • Recruitment & Selection, • Rules of Business, 1973 • Basic IT knowledge. • System of Financial Control and Budgeting, 2006 • Public Procurement Rules, 2004
20.	47/2021	Deputy Assistant Director Hajj (BS-16), Directorate of Hajj, Ministry of Religious Affairs & Interfaith Harmony.	Second Class or Grade 'C' Bachelor's degree with five (5) years post qualification experience in executive/administrative work.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test =80 marks	Part-I Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • Definition & fundamentals of Hajj • General Principles of Management • Human Resource Planning, • Recruitment & Selection, • Rules of Business, 1973 • Basic IT knowledge. • System of Financial Control and Budgeting, 2006 • Public Procurement Rules, 2004
21.	48/2021	Deputy Assistant Solicitor (BS-17), Ministry of Law and Justice.	i. Bachelor's Degree in Law or equivalent. ii. Two (2) years post qualification experience of work in Judicial or Legal appointment or practice as an Advocate in a Court of Law after enrolment as practicing Lawyer excluding attachment period.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II Professional Test=80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • Steps involved in Processing of Legal Cases • Pakistan Penal Code 1860 • The Code of Civil Procedure 1908 • Qanun-e-Shahadat Order, 1984 • Criminal Procedure Code, 1898

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
22.	49/2021	Assistant (BS-16), Gilgit Baltistan Secretariat, Ministry of Kashmir Affairs and Gilgit Baltistan.	Second Class or Grade "C" Bachelor's degree or equivalent qualification from a University recognized by HEC.	Objective Type Test (MCQ) Part-I English =20 marks Part-II General Intelligence Test =80 marks	Part-I Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • General Knowledge, • Everyday Science • Basic Arithmetic <ul style="list-style-type: none"> – Algebra – Ratios – Percentages – Arithmetic Means • Current Affairs. <ul style="list-style-type: none"> – Developments at National and International Levels in the last 2 years • Use of MS Office
23.	54/2021	Deputy Database Administrator (BS-17), (HRM Wing) Finance Division.	i. Second Class or Grade "C" Master's degree in one of the following subjects: Computer Science/ Mathematics/ Statistics/ Physics/ Economics. ii. Three (3) years post qualification experience of Budget Compilation. iii. Training in Electronic Data Processing.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II Professional Test=80 Marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • Accounting Principles & Procedures, • Scrutiny of Record for Audit Purposes, • Journal, Ledger & Cash Book, • Preparation of Annual Budget, • Financial Planning • Heads of Account, Re-appropriation of Funds and Supplementary Grant, • Settlement of Audit Objections • Public Procurement Rules, 2004 • Introduction to Oracle Database and SQL overview • Oracle Database Server Architecture
24.	55/2021	Braille Press Manager (BS-17), Directorate General of Special Education, Ministry of Human Rights.	i. Second Class or Grade 'C' Master's Degree or equivalent qualifications. ii. One year post qualification experience in supervisory capacity in Braille Printing relaxable for the holders of Certificate/ Diploma in Braille Printing. OR i. Second Class or Grade 'C' Bachelor's Degree. ii. Five (5) years post qualification experience in Braille Printing.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II General Intelligence=50 marks Part-III Professional Test=30 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • General Knowledge, • Everyday Science • Basic Arithmetic <ul style="list-style-type: none"> – Algebra – Ratios – Percentages – Arithmetic Means • Current Affairs. <ul style="list-style-type: none"> – Developments at National and International Levels in the last 2 years Part-III <ul style="list-style-type: none"> • Fundamentals of Printing of Braille Material • Composing of Braille reading material.

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
25.	56/2021	Assistant Director (Non-Technical) (BS-17), Policy Wing, Petroleum Division, Ministry of Energy.	i. Second Class or Grade "C" Master's degree in Business Administration/Public Administration/ Economics / Commerce / Statistics OR Second Class or Grade "C" Bachelor's degree in Law. ii. 03 years post qualification experience in the field of Oil Marketing/Energy Planning/Oil Movement/Administration in Government/Semi Government Organization /Commercial Organization of repute.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test =80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring. Part-II <ul style="list-style-type: none"> • General Principles of Management • Human Resource Planning, • Functions of Ministry of Energy under Rules of Business, 1973 • Basic IT knowledge. • Public Procurement Rules, 2004 • Energy Policy of Govt. of Pakistan (latest) • UN Sustainable Development Goal No. 7: Affordable, reliable, sustainable & modern energy for all
26.	60/2021	Assistant Director (Network Administrator) (BS-17), Plant Breeders Rights Registry, Ministry of National Food Security & Research.	Second Class or Grade 'C' Master's degree in Computer Science or Information Technology or equivalent qualification from a University recognized by the HEC. OR Second Class or Grade 'C' Bachelors (4 years duration) degree of BCS or BS (IT) or BS (CS) or equivalent qualification from a University recognized by the HEC. OR Second Class or Grade 'C' Bachelor's degree in Software Engineering or Computer Engineering or Computer System Engineering or equivalent qualification from a University recognized by the HEC/ PEC.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test=80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring Part-II <ul style="list-style-type: none"> • Operating System • Database Management System • System and Application software • Network & Security Issues • Data Communication and Networking • Server, Router and Switches Management • LAN/WAN/MAN, • Transport layer protocols TCP/IP, • Multiplexing, Routing, Bridging, • Network security issues.

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
27.	61/2021	Assistant Director (Protocol Officer) (BS-17), Plant Breeders Rights Registry, Ministry of National Food Security & Research.	Second Class or Grade 'C' Master's degree in Public Administration or equivalent qualification from a University recognized by HEC.	Objective Type Test (MCQ) Part-I English =20 marks Part-II Professional Test=80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring Part-II <ul style="list-style-type: none"> • Role of M/O National Food Security & Research under Rules of Business 1973 • Decision making process, • Communication process, • Administrative Ethics • Contemporary issues of Public Administration in Pakistan • Scenario Building related to Protocol duties
28.	62/2021	Assistant Director (Librarian) (BS-17), Plant Breeders Rights Registry, Ministry of National Food Security & Research.	Second Class or Grade 'C' Master's degree (2 years) in Library Science or Library and Information Science or equivalent qualification from a University recognized by HEC. OR i. Second Class or Grade 'C' Bachelor's degree with at least One (1) year diploma in Library Science or Library and Information Science or equivalent qualification from a University recognized by HEC. ii. Two (2) years post qualification experience in Library Management.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II Professional Test=80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring Part-II <ul style="list-style-type: none"> • Information Sources and Services • Cataloguing: Theory and Practice • Procurement and Maintenance of Library Books • Library Automation/Information Storage & Retrieval • Research Methods & Techniques for Librarians • Public Records, Rare Material & their Conservation • Rules & Procedure regarding Write Off the Library Losses • Role of ICT in Library Management

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
29.	63/2021	Librarian (BS-17), Ministry of Law & Justice	<p>Second Class or Grade 'C' Master's degree (2 years) in Library Science/ Information Science.</p> <p style="text-align: center;">OR</p> <p>Second Class or Grade 'C' Master's degree with Diploma in Library Science/ Bachelor of Library Science.</p> <p style="text-align: center;">OR</p> <p>i. Bachelor's degree (2 years) with Diploma in Library Science/ Bachelor of Library Science.</p> <p>ii. Five (5) years post qualification professional experience in BS-16 otherwise Eight (8) years if not in BS-16.</p>	<p>Objective Type Test (MCQ)</p> <p>Part-I</p> <p>English = 20 marks</p> <p>Part-II</p> <p>Professional Test=80 marks</p>	<p>Part-I</p> <p>Vocabulary, Grammar Usage, Sentence Structuring</p> <p>Part-II</p> <ul style="list-style-type: none"> • Information Sources and Services • Cataloguing: Theory and Practice • Procurement and Maintenance of Library Books • Library Automation/Information Storage & Retrieval • Research Methods & Techniques for Librarians • Public Records, Rare Material & their Conservation • Rules & Procedure regarding Write Off the Library Losses • Role of ICT in Library Management
30.	64/2021	Research Officer (Epidemiology) (BS-17), Ministry of National Food Security & Research.	<p>Second Class or Grade 'C' Master's (Hons) degree in Veterinary Epidemiology/Veterinary Public Health with a basic degree in Veterinary Science i.e. Doctor of Veterinary Medicine (DVM), or equivalent qualification from a University recognized by HEC.</p>	<p>Objective Type Test (MCQ)</p> <p>Part-I</p> <p>English = 20 marks</p> <p>Part-II</p> <p>Professional Test=80 marks</p>	<p>Part-I</p> <p>Vocabulary, Grammar Usage, Sentence Structuring</p> <p>Part-II</p> <ul style="list-style-type: none"> • Animal Breeding Plans & Policies in Pakistan • Animal Feed Resources • Histology & Embryology • Livestock Economics & Business Management • Principles of Animals Nutrition • Research Methods & Techniques • Descriptive epidemiology, • Analytical epidemiology, • Experimental epidemiology, • National and international disease reporting, Trans-boundary disease of veterinary importance, • TAD distribution, mapping, regulatory implications • TAD control,

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
31.	66/2021	Research Officer (Planning) (BS-17), Ministry of National Food Security & Research.	Second Class or Grade 'C' Master's (Hons) degree in Animal Husbandry or Veterinary Science with a basic degree in Veterinary Science i.e. Doctor of Veterinary Medicine (DVM) or equivalent qualification from a University recognized by HEC.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II Professional Test=80 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring Part-II <ul style="list-style-type: none"> • Animal Breeding Plans & Policies in Pakistan • Animal Feed Resources • Financial and Economic Analysis of agro livestock business, • Feasibilities for livestock poultry and related businesses, • Dairy marketing systems, • Poultry feed industry, • Evaluation of development project & Management • New Venture Planning, Management & Organization • Product Planning, Development & Marketing Patents Trade Mark • Research Methods & Techniques
32.	68/2021	Examiner (BS-17), Plant Breeders Rights Registry, Ministry of National Food Security & Research.	Second Class or Grade 'C' B.Sc (Hons) degree in Agriculture in the discipline of Plant Breeding/ Seed Technology/ Plant Pathology/ Plant Physiology/ Agronomy/ Horticulture/ Entomology/ M.Sc. (Botany) or equivalent qualification from a University recognized by HEC.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II Professional Test=60 marks Part-III General Intelligence Test=20 marks	Part-I Vocabulary, Grammar Usage, Sentence Structuring Part-II <ul style="list-style-type: none"> • Common Pests and Diseases in plants • Concepts of integrated Pest and Disease Management. • Morphological and Physiological basis of Plant Protection. • Pesticides chemistry clarification and regulations. • Plant quarantine and SPS regulations. • Biotechnology. • Locust Biology and Management. Part-III <ul style="list-style-type: none"> • General Knowledge, • Current Affairs. <ul style="list-style-type: none"> – Developments at National and International Levels in the last 1 year • Logical Reasoning and Analytical Ability

Schemes and Syllabi for Written Examination (Descriptive) for All Posts in BS-18 & BS-19 included in Consolidated Advertisement No. 02/2021

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.	29/2021
Particulars of post	Deputy District Prosecutor (BS-18), Prosecution Department, ICT, Ministry of Interior.
Minimum Qualification & Experience:	i. Second Class or Grade 'C' Bachelor's Degree in Law or equivalent qualification from a University recognized by HEC. ii. Five (5) years post qualification experience in Legal matters/ practice as an Advocate.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II.

Part-II LAW: 75 Marks (Descriptive)**I. Definitions of Crime****II. All Provisions of:**

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

SUGGESTED READINGS

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

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

Case No.	30/2021
Particulars of post	Deputy Director (Legal) (BS-18), Federal Directorate of Education, Ministry of Federal Education & Professional Training.
Minimum Qualification & Experience:	i. Bachelor Degree in Law or equivalent qualification. ii. Five (5) years post qualification experience of work in Legal matters in BS-16 and above or equivalent in Government/ Semi Government/ Autonomous Bodies or practice as an Advocate in Service Tribunal/ Court of law.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II.

Part-II LAW: 75 Marks (Descriptive)**I. Definitions of Crime****II. All Provisions of:**

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

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4.	Qanun-e-Shahadat Order, 1984	
5.	The Code of Civil Procedure, 1908	Aamir Raza A. Khan
6.	The Arbitration Laws in Pakistan	M. Mahmood
7.	Civil Courts Ordinance, 1962	Nisar Ahmad Nisar

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

Case No.	35/2021
Particulars of post	Associate Professor (Mathematics) (BS-19), Federal College of Education, Ministry of Federal Education and Professional Training.
Minimum Qualification & Experience:	Second Class or Grade 'C' Master's Degree in Mathematics with Twelve (12) years post qualification teaching/administrative experience at College/University level.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II & Part-III.

Part-II: (Mathematics) 50 Marks (Descriptive)**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-III: (Professional) 25 Marks (Descriptive)

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. Research Methods in Education

- Research Instruments: Questionnaire: Interview; Test; Observation; Rating Scale
- Research Proposal and Report Writing

SUGGESTED READINGS

S. No.	Title	Author
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.	39/2021
Particulars of post	Deputy Director (Town Planning) (BS-19), ML&C Department, Ministry of Defence.
Minimum Qualification & Experience:	<ul style="list-style-type: none"> i. Second Class or Grade 'C' B.Sc Degree from a recognized University in Town Planning. ii. Associate Member of the Pakistan Institute of City and Regional Planning. iii. Twelve (12) years post qualification practical experience in the field of Town Planning. iv. Must be registered with Pakistan Council of Architects & Town Planners.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II & Part-III.

Part-II: (Town Planning) 50 Marks (Descriptive)

- I. Definition of Town Planning, Goals and objectives of Town Planning:** Town Planning as a multi-disciplinary approach and relationship of Town Planning with other professions.
- II. Historical Perspective of Urban Planning:** Planning of historical towns in the world. Examples of planned towns in Europe, Nile Valley region, Euphrates and Tigris Valley region and Indus Valley region (Mohenjodaro, Harappa, Kot Diji and Mehr Garh and Gandhara Civilization).
- III. Urban Rural Differences and Hierarchy of Settlements:** Urbanization and its effects on the environment of urban areas.
- IV. Public Policy and Urban Design Management:** Solving social and environmental problems using:
 - a. Economics,
 - b. Policy analysis,
 - c. Political science and
 - d. Urban Design
- V. Urban Information Systems:** Use of planning related software and spatial analysis tools and systems e.g. GIS, SPSS etc.

Part-III: 25 Marks (Descriptive)

(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, Principles of Organization, 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; Elements of Financial Administration, 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, Characteristics of Computer and related material; 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;

SUGGESTED READINGS

S. No.	Title	Author
1.	Introducing Town Planning	Clara Greed
2.	Introduction to Town and Country Planning	John Ratcliff
3.	Town Planning for the Third World	A.K. Bhatti
4.	Contemporary Urban Planning	J.M. Levy
5.	Land Use, Planning, and Zoning	Peter J. Loughlin,
6.	Town Planning in Practice	Raymond Unwin,
7.	Human Resource Management	H.T. Graham & Roger Bennett
8.	Management	James A.F. Stoner, R. Eward Freeman, Daniel R. Gilbert Jr.
9.	Understanding Computer: Today and Tomorrow	Deborah Morley, Charles Parker
10.	MS Office 365 Handbook: 2013 Edition	Kevin Wilson

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

Case No.	41/2021
Particulars of post	Deputy Armament Supply Officer (BS-18) , Pakistan Navy, Ministry of Defence.
Minimum Qualification & Experience:	i. Second Class or Grade 'C' Master's Degree in Chemistry/ Physics. ii. Five (5) years post qualification experience in Explosives/ Dangerous Cargoes/ Petroleum/ Oils/ Lubricants.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II & Part-III.

Part-II: (Chemistry) 40 Marks (Descriptive)

- I. Atomic structure.—Quantum theory, Schrodinger equation, Particle in box, hydrogen atom. Hydrogen moleculeion, hydrogen molecule. Theories of hydrogen and metallic bonding.
- II. Electrochemistry.—Ionic equilibria, theory of strong electrolytes; ebye-Huckel theory of activity coefficients, galvanic cells, membrane equilibria and fuel cells. Theories of Acids and Bases, glass electrode, measurement of pH. Electrolysis, overvoltage and corrosion.
- III. Thermodynamics.—First law of thermodynamics, internal energy, enthalpy functions. Thermochemistry, Entropy and second law of Thermodynamics, Free energy and chemical equilibrium.
- IV. Chemistry of Following Elements.—Oxygen, Carbon, Chlorine, Silicon, Nitrogen, Phosphorus.
- V. Inorganic Chemical Industries.—Sulphuric Acid, Fixation of Nitrogen, Chemical Fertilizers, Semi-conductivity devices. Cement, Glass and Ceramics.
- VI. Industrial Organic Chemistry.—Organic Polymers. Fermentation processes including preparation of Anti-Biotics. Petro-Chemical Industry.

Part-III: (Physics) 35 Marks (Descriptive)**I. Mechanics**

- Vectors—Dots, Cross and triple products, Gradient, divergence and applications.
- Newtonian laws of motion; calculus based approach to kinematics, forces and dynamics, conservation law of energy; conservation of linear and angular momentum; Dynamics of rigid body; spin and precession; gyroscope; Gravitation; planetary motion and satellites; Kepler's laws; centripetal forces
- Special theory of relativity. Michelson—Morley experiment and Einstein's postulates; Lorentz transformation; time dilation and length contraction; equivalence of mass and energy.

II. Fluid Mechanics

- Surface tension; Viscosity; Elasticity; fluid motion and Bernoulli's theorem.

III. Heat and Thermodynamics

- Perfect gas and Vander Waals equation; Three Laws of Thermodynamics,

internal energy, temperature, entropy. Thermal properties of Simple system production and measurement of low temperatures; kinetic theory of gases; Maxwellian distribution of molecular velocities; Brownian motion; Transport phenomena. Classical Maxwell-Boltzmann Statistics and its application; Quantum Bose—Einstein and Fermi—Dirac Statistics.

IV. Electricity and Magnetism

- Electric field due to point charges, Gauss' law Electric potential and Poisson and Laplace's equation Dielectric medium and Polarization; Capacitance; Moving charges and resulting magnetic field; Ampere's law; Vector potential; Magnetic properties of matter; Transient current; Faraday's law of electromagnetic induction; Alternating current and LRO circuit. Maxwell's equations; Poynting theorem and Poynting Vector. Maxwell's equations in integral and differential form.

V. Solid State Physics

- Crystal lattice and structure, Bravais lattice, free electron model, Band theory and electron in a periodic potential, Fermi energy and density of states, n and p type semiconductors, physics of the transistor and MOSFET, dielectric properties, magnetic properties and origin of magnetism.

VI. Nuclear Physics

- Structure of Nuclei; Radioactivity, α , β and γ decay. Methods of detection, Mass Spectrometer. Accelerators. Phenomenon of fission; reactor and nuclear power, nuclear fusion and its application, Elementary particles and their properties.

SUGGESTED READINGS

S. No.	Title	Author
1.	Advanced Inorganic Chemistry 3 rd Ed.	Cotton. F.A. and Wilkinson Groffrey
2.	Inorganic Chemistry, 3 rd Ed. 1983	Hukeavy, James E.
3.	Physical Chemistry 5 th Ed.	Moore, Walter J.
4.	Mechanism & Structure in Organic Chemistry	Gould, Edwards
5.	Organic Chemistry 2 nd Ed.	Morrison, Robert Thornton & Boyd R.N.
6.	Perspectives of Modern Physics.	A. Beiser.
7.	Fundamentals of Physics.	Halliday & Resnick
8.	Introduction to Electromagnetic Fields and Waves.	D. Corson & P. Lorrain.
9.	Heat and Thermodynamics.	D. Zemansky
10.	Introduction to Quantum Mechanics	D. Griffiths
11.	Modern Physics	Serway, Moses, Moyer.
12.	Solid State Physics	C. Kittel

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

Case No.	42/2021
Particulars of post	Senior Prosthetics & Orthotist (BS-18) , Armed Forces Institute of Rehabilitation Medicine, Ministry of Defence.
Minimum Qualification & Experience:	<ul style="list-style-type: none"> i. BS in Orthopedic Technology from a University recognized by HEC. ii. Five (5) years post qualification experience as Prosthetics and Orthotist in Government Organization. The candidate must have experience in CAD CAM Technology and Pressure Measurement Systems.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II.

Part-II: (Professional) 75 Marks (Descriptive)**I. Advanced Orthotics and Prosthetics**

- Spinal orthotics
- CAD/CAM Orthotics/Prosthetics
- Lower limb orthotics

II. Lower Limb Prosthesis

- Lower limb prosthetics
- Sports Prosthetics
- Advance Socket Designing
- Hydraulic Knees

III. Upper Limb Prosthesis

- Anatomy of muscles
- Upper Limb prosthesis
- Upper Limb Myoelectric prosthesis

IV. Pressure Measurement

- Internal socket Pressure measurement
- Pressure measurement with different knees and feet

V. Legal Aspect of Sports Prosthetics

- Ban on flex foot cheetah in IAAF and ADA
- Oscar Pistorius

SUGGESTED READINGS

S. No.	Title	Author
1.	Physical Medicines and Rehabilitation fourth edition	Randall L. Braddom
2.	Powered Upper Limb Prosthesis	Ashok Muzamdar
3.	Biomechanics of Lower Limb Prosthetics	Mark R Pitkin
4.	Marquette sports law review volume 19	

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

Case No.	45/2021
Particulars of post	Deputy Director (Horticulture) (BS-18), PAK. P.W.D, Ministry of Housing and Works.
Minimum Qualification & Experience:	i. Second Class or Grade "C" Master's degree in Agriculture. ii. B.Sc.(Hons) degree in Agriculture with Horticulture as major subject. iii. Five (5) years post qualification experience in the field of Horticulture/ Agriculture.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II.

Part-II (Professional): 75 Marks (Subjective)**I. Introductory Horticulture**

Introduction, history, importance and future scope, Definition and divisions of horticulture, Classification of horticultural crops, Plant parts, their modifications and functions, Plant environment; climate (temperature, light, humidity etc) and soil (structure, texture, fertility etc), Phases of plant growth, Propagation of horticultural plants.

II. Horticultural Crop Production

Establishment of orchards, vegetable farms and ornamental gardens; site selection, layout methods, wind breaks and their role. Management practices; irrigation, manures and fertilizers, training and pruning, cultivation and weed control. Climate, soil, propagation, rootstocks, cultivars, important pests, harvesting, post-harvest handling and marketing of important horticultural crops (fruits, vegetables and ornamentals) of the region.

III. Landscape Horticulture

Classification of landscape plants, Growth habits, foliage and flowering effects, Propagation and maintenance of important landscape plants and turf grasses Introduction to landscape design, hardscape and softscape, Principles, elements and types of landscape, Suitability of various plants for different purposes and locations, Irrigation systems for different landscapes, Landscape planning, installation, maintenance, and budget estimation.

SUGGESTED READINGS

S. No.	Title	Author
1.	Handbook of Horticulture	Chadha, K.L.
2.	Introductory Horticulture.	Christopher, E. P.
3.	Horticulture: Principles and Practices	Acquaah, G.
4.	Principles of Horticulture	Adams, C. R., K.M. Bamford and M. P. Early
5.	Horticulture,	Malik, M.N. National Book Foundation, Islamabad.
6.	Introductory Ornamental Horticulture	Arora, J.S.
7.	Introduction to Landscaping Design, Construction and Maintenance	Biondo, R.J., and C.B. Schroeder

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

Case No.	50/2021
Particulars of post	Director (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;">OR</p> <p>i. Ph.D in Defence & 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: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II.

Part-II: 50 Marks (Descriptive)

(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. PPRA Ordinance 2002 and Rules 2004

Part-III: 25 Marks (Descriptive)

(Human Resource, Financial Management and Quality Management)

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;

SUGGESTED READINGS

S. No.	Title	Author
1.	An Introduction to the Public Administration	E.N. Cladden
2.	Bureaucracy: Modern Society	Pebr, M.Blau.
3.	Public Administration for a Welfare State	Paul Ableby
4.	The Bureaucracy of Pakistan	Charles F. Kennedy
5.	Human Resource Management	H.T.Graham & Roger Bennett
6.	Management	James A.F.Stoner, R.Eward Freeman, Daniel R.Gilbert Jr.

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

Case No.	51/2021
Particulars of post	Assistant Electronics Adviser (BS-18), Ministry of Science & Technology.
Minimum Qualification & Experience:	<p>i. Second Class or Grade 'C' M.Sc. in Physics with specialization in Electrical/ Electronics or equivalent qualification from a University recognized by HEC.</p> <p style="text-align: center;">OR</p> <p>Second Class or Grade 'C' B.E/ B.Sc. (Engineering) in Electrical/ Electronics/Telecommunications/Instrumentation/Control System/ Power/ Aerospace/ Avionics/ Mechatronics recognized by Pakistan Engineering Council (PEC).</p> <p>ii. Five (5) years post qualification experience in Research & Development/ Science & Technology Management.</p>

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II & Part-III.

Part-II: (Physics) 50 Marks (Descriptive)**I. Mechanics**

- Vectors—Dots, Cross and triple products, Gradient, divergence and applications.
- Newtonian laws of motion; calculus based approach to kinematics, forces and dynamics, conservation law of energy; conservation of linear and angular momentum; Dynamics of rigid body; spin and precession; gyroscope; Gravitation; planetary motion and satellites; Kepler's laws; centripetal forces
- Special theory of relativity. Michelson—Morley experiment and Einstein's postulates; Lorentz transformation; time dilation and length contraction; equivalence of mass and energy.

II. Fluid Mechanics

- Surface tension; Viscosity; Elasticity; fluid motion and Bernoulli's theorem.

III. Heat and Thermodynamics

- Perfect gas and Vander Waals equation; Three Laws of Thermodynamics, internal energy, temperature, entropy. Thermal properties of Simple system production and measurement of low temperatures; kinetic theory of gases; Maxwellian distribution of molecular velocities; Brownian motion; Transport phenomena. Classical Maxwell-Boltzmann Statistics and its application; Quantum Bose—Einstein and Fermi—Dirac Statistics.

IV. Electricity and Magnetism

- Electric field due to point charges, Gauss' law Electric potential and Poisson and Laplace's equation Dielectric medium and Polarization; Capacitance; Moving charges and resulting magnetic field; Ampere's law; Vector potential; Magnetic properties of matter; Transient current; Faraday's law of electromagnetic induction; Alternating current and LRO circuit. Maxwell's equations; Poynting theorem and Poynting Vector. Maxwell's equations in integral and differential form.

V. Solid State Physics

- Crystal lattice and structure, Bravais lattice, free electron model, Band theory and electron in a periodic potential, Fermi energy and density of states, n and p type

semiconductors, physics of the transistor and MOSFET, dielectric properties, magnetic properties and origin of magnetism.

VI. Nuclear Physics

- Structure of Nuclei; Radioactivity, α , β and γ decay. Methods of detection, Mass Spectrometer. Accelerators. Phenomenon of fission; reactor and nuclear power, nuclear fusion and its application, Elementary particles and their properties.

Part-III: (Research and Planning) 25 Marks (Descriptive)

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) Statistical Techniques

All statistical techniques related to Planning & Research

SUGGESTED READINGS

S. No.	Title	Author
1.	Perspectives of Modern Physics.	A. Beiser.
2.	Fundamentals of Physics.	Halliday & Resnick
3.	Introduction to Electromagnetic Fields & Waves	D. Corson & P. Lorrain.
4.	Heat and Thermodynamics.	D. Zemansky
5.	Introduction to Quantum Mechanics	D. Griffiths
6.	Modern Physics	Serway, Moses, Moyer.
7.	Solid State Physics	C. Kittel
8.	Practical English Grammar	A.J. Thomson and A.V. Martinet.
9.	Writing. Intermediate	Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet.
10.	Writing. Upper-Intermediate	Rob Nolasco.
11.	Reading. Advanced	Brian Tomlinson and Rod Ellis.
12.	Study Skills	Riachard Yorkey
13.	Writing. Advanced	Ron White.
14.	College Writing Skills	John Langan.
15.	Patterns of College Writing	Laurie G. Kirszner and Stephen R. Mandell.
16.	The Mercury Reader. A Custom Publication.	Janice Neulib; Kathleen Shine Cain; Stephen Ruffus and Maurice Scharon.
17.	Project Management Body of Knowledge,	Project Management Institute (PMI) standards committee
18.	Software Project Management	S.A. Kelkar, A Concise Study, Prentice Hall of India.

PAPER-II: PROFESSIONALMax Marks: 100Time Allowed: 3 Hours

Case No.	52/2021
Particulars of post	Neuro Physician (BS-18), National Institute of Rehabilitation Medicine, Ministry of National Health Services, Regulations & Coordination.
Minimum Qualification & Experience:	<ul style="list-style-type: none"> i. MBBS or equivalent qualification recognized by PM&DC. ii. PM&DC Level-III qualification in the relevant specialty. iii. Two (2) years post qualification experience in the relevant field.

Part-I: (MCQ)**25 Marks**

25 MCQ Questions on Part-II & Part-III.

Part-II: (Qualification Based) (Descriptive)**50 Marks**Core courses of **MBBS Degree****Part-III: (Professional) (Descriptive)****25 Marks**Core courses of Level-III qualification (**Neurology**).

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

Case No.	53/2021
Particulars of post	Director (LAB/NEQS) (BS-19), Pakistan Environmental Protection Agency (Pak-EPA), Ministry of Climate Change.
Minimum Qualification & Experience:	i. Second Class or Grade 'C' M.Sc. in Biology/ Chemistry/ Bio-Chemistry/ Chemical technology. ii. Twelve (12) years post qualification experience in BS-17 or above or equivalent in any of the prescribed educational qualification in Government/ Semi Government/ Reputable Organization.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II.

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

- I. Photosynthesis: Plant pigments, Light reaction, CO₂ fixation, Mechanism of photophosphorylation.
- II. Molecular Biology: Nucleic acids, DNA as hereditary material, DNA replication, Transcription, Genetic code, Protein synthesis, Genetic engineering and its application, Genetically Modified Organisms (GMO).
- III. Inorganic Chemical Industries.—Sulphuric Acid, Fixation of Nitrogen, Chemical Fertilizers, Semi-conductivity devices. Cement, Glass and Ceramics.
- IV. Physical Organic Chemistry.—Elements of Organic reaction mechanism. Optical and Geometric Isomerism. Conformational analysis. Resonance. H—Bond and its effects on the properties of Organic Compounds.
- V. Chemistry of Natural Products.—Elementary study of Carbohydrates. Oils and Fats. Alkaloids and Vitamins.
- VI. Industrial Organic Chemistry.—Organic Polymers. Fermentation processes including preparation of Anti-Biotics. Petro-Chemical Industry.
- VII. Environmental Pollution: Air Pollution, Water Pollution, Soil Pollution, Noise Pollution, Solid Waste, Water Logging & Salinity, Deforestation, Desertification, Eutrophication, Global and regional air pollution problems (Greenhouse effect, Global Warming/Climate Change, Ozone Depletion, Acid Rain).
- VIII. Climate Change: Climate Pattern at local, regional and global scale. Climate change processes, Drivers and Indicators of Climate Change, Effects of Climate Change on natural and societal systems. Carbon foot print. Climate change adaptation and mitigation, Clean Development Mechanism (CDM), REDD+. Global environmental politics on climate change.
- IX. Environmental Laws

Part-III: 25 Marks (Descriptive)

(Human Resource, Financial Management and Quality Management)

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;

SUGGESTED READINGS

S. No.	Title	Author
1.	Environmental Science: Earth as a living Planet	Botkin, D. Keller, E.
2.	Environmental Health; Ecological Perspective	Kathryn Hilgenkamp
3.	Advanced Inorganic Chemistry 3rd Ed.	Cotton. F.A. and Wilkinson Groffrey
4.	Inorganic Chemistry, 3rd Ed. 1983	Hukeavy, James E.
5.	Physical Chemistry 5th Ed.	Moore, Walter J.
6.	Mechanism & Structure in Organic Chemistry	Gould, Edwards
7.	Organic Chemistry 2nd Ed.	Morrison, Robert Thornton & Boyd R.N.
8.	Human Resource Management	H.T.Graham & Roger Bennett
9.	Management	James A.F.Stoner, R.Eward Freeman, Daniel R.Gilbert Jr.

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

Case No.	57/2021
Particulars of post	Director (System) (BS-19), Policy Wing, Petroleum Division, Ministry of Energy.
Minimum Qualification & Experience:	i. Bachelor's degree in Chemical/Refining Engineering. ii. Twelve (12) years post qualification experience in Oil Refineries or Petroleum related field in posts in BS-17 and above.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II.

Part-II (Professional): 75 Marks (Subjective)**I. Petroleum Refinery Engineering**

Introduction; origin; formation and composition of petroleum; Indigenous and world resources. Refinery products; properties; significant tests and standard test methods; characterization and evaluation of crude oil stocks; generation of crude processing data; Crude preheating and preliminary treatment; pipe still heaters; desalting; atmospheric and vacuum distillation; steam stripping; arrangement of towers. Calculation of number of trays, types of reflux employed; Packie's approach; processing plans, schemes and product patterns of refineries. Modern separation, conversion and treatment processes. Thermal and catalytic cracking and reforming, hydrocracking. Auxiliary processes and operations; refinery corrosion and metals; blending plants, product design and marketing. Use of linear programming techniques to solve refinery blending and production problems; Overview of petroleum act.

II. Fuels & Energy

Survey of available energy resources. Introduction and survey of locally available fuels, industrial fuels: Classification and storage of solids, liquids and gaseous fuels: Criteria and characterization for the selection of fuels for industrial purposes; Carbonization, liquefaction and gasification of coal; Synthetic fuels; Petroleum refining, natural gas processing & syngas production. Fuel up gradation, Fisher tops process and clean coal technology

Furnaces, Burners and their performance Biomass Sources, Pre-treatment of biomass for thermo-chemical conversion, methods of production of fuels from biomass, Gasification and liquefaction of forest products, Biomass volatilization, Kinetics of gasification, Ethanol and Methanol production from biomass.

III. Chemical Engineering Economics

Engineering economy basics: Measures of financial effectiveness; Non-monetary factors and multiple objectives; principles of engineering economy. Consumer and producer goods; Measures of economic worth; Price, Supply and Demand relationship; Production; Factors of production; Laws of return, Taxation & Insurance.

Depreciation calculation Sunk and opportunity costs; Fixed, variable and incremental costs; Recurring and nonrecurring costs; Direct, indirect and overhead costs; Standard costs; Break even analysis; Unit cost of production; Cost-benefit analysis; Feasibility

studies; Value analysis in designing and purchasing. Economic evaluation of processes and equipment; Payback period method; Present worth method; Uniform annual cost method; Rate of return method (including Internal Rate of Return). Manufacturing lead time; Production rate; Capacity; Utilization; Availability; Work in process; WIP and TIP ratios.

Types of ownership; types of stock; Partnership & joint stock companies; Banking and specialized credit institutions. Islamic and Contemporary financing systems and their use in cost estimation.

IV. Mineral Processing

Introduction to Mineralogy; Objectives of mineral processing. Properties of minerals and ores. Sampling and evaluation. Comminution: fracture, liberation, size criteria, energy-size relationships. Crushing and grinding. Screening and classifying. Concentration processes: density and other physical processes. Interfacial phenomena. Flotation. Liquid-solid separation: flocculation, thickening, filtration. Wash ability curves. Partition curves. Material balances. Performance prediction. Applications of biotechnology in mineral processing.

SUGGESTED READINGS

S. No.	Title	Author
1.	Petroleum Refinery Engineering	W.L. Nelson,
2.	Refining Processes Handbook,	S. Parkash,
3.	An Introduction to Combustion	Turns, S.R.
4.	Flame and Combustion	Griffiths, J.F. & Barnard, J.A.
5.	Engineering Economy	Leland Blank, and Anthony Tarquin
6.	Essentials of Engineering Economics	James L. Riggs, and Thomas M. West
7.	Engineering Economy	William G. Sullivan & C. Patrick koelling
8.	Applied Mineralogy: A Quantitative Approach	Jones, Meurig P.,
9.	Introduction to Mineral Processing	Kelly, Errol G. And Spottiswood, David J.

PAPER-II: PROFESSIONALMax Marks: 100Time Allowed: 3 Hours

Case No.	58/2021
Particulars of post	Deputy Financial Analyst (BS-19) , HRM Wing, Finance Division
Minimum Qualification & Experience:	<p>FCMAP/Chartered Accountant with seven (7) years post qualification experience of a job equivalent to BS-17 and above in the field of Finance including Management of Public Debt/ Financial Analysis/ Auditing of Financial Institutions in Government/ Semi Government/ Reputable Private Organization/ Firm.</p> <p style="text-align: center;">OR</p> <p>ACMAP with Ten (10) years post qualification experience of a job equivalent to BS-17 and above in the field of Finance including Management of Public Debt/ Financial analysis/ Auditing of Financial Institutions in Government/ Semi Government/ Reputable Private Organization/ Firm.</p> <p style="text-align: center;">OR</p> <p>MBA/M.Com. with Finance as major subject with twelve (12) years post qualification experience of a job equivalent to BS-17 and above in the field of Finance including Management of Public Debt / Financial Analysis / Auditing of Financial Institutions in Government / Semi- Government / Reputable Private Organization / Firm.</p>

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II.

Part-II (Professional): 75 Marks (Subjective)

- I. Accounting Concepts and Principles:** Definition and scope of financial accounting; basic principles of accounting; concepts and conventions underlying accounting statements, the impact of International Accounting Standards as applicable in Pakistan. (IAS 1,2, & 18).
- II. Accounting Procedures and Systems:** Principles of double-entry book-keeping; accrual based accounting system, adjusting, closing and reversing entries, methods of keeping and presenting books of prime entry (cash book, petty cash book, sales journal, purchase journal, purchase and sales return journals etc); principal and subsidiary ledgers, trial balance.
- III. Control Accounts :** Receivable control accounts; payable control accounts, errors of control accounts (including subsidiary ledger) and reconciliation of control accounts and subsidiary ledger.
- IV. Inventory Accounting:** Nature and classes of inventories, periodic and perpetual inventory systems, periodic and perpetual inventory system; requirements and application of IAS-2.
- V. Accounts Receivable:** Receivables and its subsidiary ledger; recording bad debts and its recovery; estimation of allowance for bad and doubtful debts (both income statement and balance sheet approaches of estimation).

- VI. Cash Control:** Preparation of petty cash statement and maintenance of petty cash system; preparation of bank reconciliation statement; cash receipts and payments accounts. The purpose, requirements and process of internal audit relating to cash control; financial control, errors and frauds.
- VII. Tangible Non-Current Assets (IAS-16 including Revaluation of Assets):** Recognition and measurement of tangible noncurrent assets; distinction between and application of principles of capital and revenue expenditures, concept of depreciation; methods and recording of depreciation; change of method; revision of life of an asset; accounting for disposal and exchange of tangible non-current assets; application of IAS-16.
- VIII. Intangible Non-Current Assets (including IAS-38 Portion only):** Nature and composition of intangible assets; accounting treatment of intangible assets of goodwill and research and development; methods of goodwill computation; impairment of goodwill (concept and recording entry); capitalization of development cost; amortization development cost (concept and recording entry); application of IAS- 38 in respect of research and development and goodwill.
- IX. Computer-based Accounting Systems:** Computer-based application in accounting; advantages of computer-based systems, ways of achieving Internal controls in a computer-based accounting system.
- X. Preparation of Financial Statements of a Sole Proprietor (both trading & manufacturing concern):** Elements and components of Financial Statements in accordance with format of IAS-1; Financial Statements (balance sheet, income statement and cash flow statement) of sole proprietor in respect of trading; reference to basic financial ratios (liquidity ratios only).

SUGGESTED READINGS

S. No.	Title	Author
1.	Frankwood Business Accountancy: Accounting Principles	Frankwood Jerry. J IASB
2.	IFRSs/IASs Accounting: The Basis for Business Decision	Robert F. Meigs, Jan R. Williams, Susan F. Hakar, Mark S. Bettner, Jack L. Smith
3.	Accounting Principles	Jack L. Smith
4.	Financial Accounting Fundamentals	Professional Business Publications, Lahore.

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

Case No.	59/2021
Particulars of post	Deputy Director (Senior Examiner) (BS-18), Plant Breeders Rights Registry, Ministry of National Food Security & Research.
Minimum Qualification & Experience:	i. Second Class or Grade 'C' B.Sc. (Hons) degree in Agriculture in the discipline of Plant Breeding/ Seed Technology/ Plant Pathology/ Plant Physiology/ Agronomy/ Horticulture/ Entomology/ M.Sc. (Botany) or equivalent qualification from a University recognized by HEC. ii. Five (5) years post qualification experience in Plant Breeders Rights Registry/ Plant Variety Registration/ "Distinctness, Uniformity and Stability" (DUS) Examination.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II.

Part-II (Professional): 75 Marks (Subjective)

- I. Introductory Plant Breeding:** Introduction to plant breeding and its role in crop improvement. Reproductive systems in major crop plants. Genetic variation and its exploitation, creation of variation through genetic recombination, mutation and heteroploidy. Breeding self-pollinated crops: introduction, mass selection, pure line selection; hybridization, pedigree method, bulk method and backcross techniques. Breeding cross-pollinated crops: introduction, mass selection, recurrent selection, development and evaluation of inbred lines, development of hybrids, synthetic and composite populations. New trends in plant breeding.
- II. Plant Pathology :**Introduction and history of plant pathology; basic characteristics of fungi, bacteria, viruses and nematodes; concept of disease in plants; economic importance of plant diseases; nature and cause of (biotic and abiotic) diseases; components of plant disease development; diagnosis of plant diseases; principles of plant disease management; Introduction to IDM and IPM; symptoms, ethology, mode of infection, disease cycle and management of representative diseases of agricultural and horticultural crops.
- III. Genetic Improvement for Crop Production:** GMO crops, Seed production technology.
- IV. Horticulture:** Floriculture, landscaping, pests and diseases of agriculture crops and their control, integrated pest management.
- V. Rainfed and Irrigated Agriculture:** Agriculture mechanization, land tenure and land reforms, role of agriculture in national economy.

Suggested Reading

S. No.	Title	Author
1.	Breeding Field Crops. (5th ed.)	Sleper, D. A. and J.M. Poehlman
2.	Principles and Procedures of Plant Breeding.	Chahal, G.S. and S.S. Gosal.
3.	Plant Breeding. National Book Foundation,	Khan, M.A (Editor).
4.	Plant Pathology,	Agrios, G.N.
5.	A Text Book of Introductory Plant Pathology.	Ahmad, I. and A.R. Bhutta
6.	A Text Book of Plant Pathology	A.V.S.S. Sambamurti
7.	The Principles of Agronomy.	Harris, Franklin Stewart

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

Case No.	65/2021
Particulars of post	Assistant Animal Husbandry Commissioner (BS-18), Ministry of National Food Security & Research
Minimum Qualification & Experience:	i. Second Class or Grade 'C' Master's (Hons.) degree in Animal Husbandry or Veterinary Science with a basic degree in Veterinary Science i.e. Doctor of Veterinary Medicine (DVM) or equivalent qualification from a University recognized by HEC. ii. Five (5) years post qualification experience of work in any field of Animal Husbandry/ Veterinary Sciences.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II.

Part-II (Professional) (Subjective) : 75 Marks**I. Veterinary Protozoology**

Protozoology: definition, history and differences from other unicellular organisms, Anatomy and physiology of protozoa, Classification, Morphology, Life cycle, Pathogenesis, Diagnosis and Control of the species of the following genera of Protozoa, Trypanosoma / Leishmania, Trichomonias and Histomonas, Entamoeba, Giardia and Balantidium, Eimeria and Isospora, Toxoplasma and Sarcocystis, Toxoplasmosis and Sarcocystosis and Plasmodium, Plasmodium, Haemoproteus, Leucocytozoan and Hepatozoan, Babesia, Theileria, Anaplasma & Cryptosporidium, Ehrlichia & Eperythrozoon, Protozoan zoonosis.

II. Systemic Veterinary Pathology

Digestive system, Skin and Appendages, Dermatophytes (Ring Worms), Mange: Psoroptic, chorioptic mange, neoplasia, Urinary system, Cardiovascular system, Nervous system, Respiratory system, Musculo-skeleton system, Rickets, Osteomalacia, Osteodystrophy, Osteoporosis, Osteopetrosis, Exostoses, neoplasia, Reproductive System, Postparturient Haemoglobinuria,

III. Small Ruminant Production

Scope and role of small ruminants, Sheep and goat as milch, meat and wool/hair producer. Grazing management systems and supplementary feeding, Management during drought, Record keeping of sheep and goat, Fencing on ranges, Shearing and handling wool/hair,

IV. Ruminant Nutrition

Nutrients, their classification and requirements, Concept of forage, concentrate and non-conventional feed resources in feeding of ruminants, Feeding standards, their usefulness and limitations for large ruminants. Feeding standards, their usefulness and limitations for small ruminants. Nutrient requirements of cattle for maintenance, production and reproduction. Nutrient requirements of buffaloes for maintenance, production and reproduction. Nutrient requirements of sheep for maintenance, production and reproduction, Nutrient requirements of beef animals for maintenance and fattening. Concept of digestibility and nitrogen balance. Feeding management of

dairy animals at different physiological stages, Feeding practices of small ruminants, Nutritional management of grazing livestock, Feeding of calves from birth to puberty.

V. Meat Production

Scope and importance of meat production in Pakistan, Present situation of meat industry and Problems of meat industry in Pakistan, Feeding of beef Animals, Breeding of beef Animals, Management of Beef Animals, Feed additives, hormones and Probiotics, Vitamins etc for enhanced growth Antibiotics, Factors affecting carcass and meat quality, Meat Hygiene, Storage and Preservation of Meat, Marketing of beef animals and beef, Modern Slaughter Houses, Slaughtering Methods.

SUGGESTED READINGS

S. No.	Title	Author
1.	General Parasitology and Protozoology.	Akhtar, M., M. A. Hafeez and C. S. Hayat 2003.
2.	Techniques in Parasitology. Higher Education Commission, Pakistan	Iqbal, Z., M.S. Sajid, A. Jabbar, Z.A. Rao and M.N. Khan, 2006.
3.	Introduction to Veterinary Pathology.	Cheville, N. F., 2006.
4.	Pathologic Basis of Veterinary Disease	McGavin, D. M. and J. F. Zachary, 2006.
5.	Sheep and Goat Production, Univ. of Agriculture, Faisalabad.	Khan, B.B., A. Iqbal and M.I. Mustafa. 2003.
6.	Recent Advances in Ruminant Nutrition.	Garnsworthy and J. Wiseman. 2002.
7.	Commercial Poultry Nutrition,	Lesson, S. and J.D. Summers. 2001.
8.	Feed Manufacturing Technology	McEllihiney, R.R. 1994.
9.	Dictionary of Animal Nutrition and Feed Technology,.	Singhal, K.K. 1992.
10.	Meat Production and Technology in Pakistan, PARC, Islamabad.	Alvi, A.S. 1991.
11.	Meat Hygiene and Inspection.	Anwar, A.H. 1996.
12.	Meat Hygiene. Bailliere Tindall, UK.	Gracey, J. F. and Collins D.S. 1992

PAPER-II: PROFESSIONALMax Marks: 100Time Allowed: 3 Hours

Case No.	67/2021
Particulars of post	Director (BS-19), Plant Breeders Rights Registry, Ministry of National Food Security & Research
Minimum Qualification & Experience:	<p>i. Second Class or Grade 'C' B.Sc. (Hons) degree in Agriculture in the discipline of Plant Breeding/ Seed Technology/ Plant Pathology/ Plant Physiology/ Agronomy/ Horticulture/ Entomology/ M.Sc (Botany) or equivalent qualification from a University recognized by HEC.</p> <p>ii. Twelve (12) years post qualification experience in Plant Breeders Rights Registry/ Plant Variety Registration/ "Distinctness, Uniformity and Stability" (DUS) Examination.</p>

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II.

Part-II (Professional): 75 Marks (Subjective)

- I. Introductory Plant Breeding:** Introduction to plant breeding and its role in crop improvement. Reproductive systems in major crop plants. Genetic variation and its exploitation, creation of variation through genetic recombination, mutation and heteroploidy. Breeding self-pollinated crops: introduction, mass selection, pure line selection; hybridization, pedigree method, bulk method and backcross techniques. Breeding cross-pollinated crops: introduction, mass selection, recurrent selection, development and evaluation of inbred lines, development of hybrids, synthetic and composite populations. New trends in plant breeding.
- II. Plant Pathology :**Introduction and history of plant pathology; basic characteristics of fungi, bacteria, viruses and nematodes; concept of disease in plants; economic importance of plant diseases; nature and cause of (biotic and abiotic) diseases; components of plant disease development; diagnosis of plant diseases; principles of plant disease management; Introduction to IDM and IPM; symptoms, etiology, mode of infection, disease cycle and management of representative diseases of agricultural and horticultural crops.
- III. Genetic Improvement for Crop Production:** GMO crops, Seed production technology.
- IV. Horticulture:** Floriculture, landscaping, pests and diseases of agriculture crops and their control, integrated pest management.
- V. Rainfed and Irrigated Agriculture:** Agriculture mechanization, land tenure and land reforms, role of agriculture in national economy.

Suggested Reading

S.No.	Title	Author
1.	Breeding Field Crops. (5th ed.)	Sleper, D. A. and J.M. Poehlman
2.	Principles and Procedures of Plant Breeding.	Chahal, G.S. and S.S. Gosal.
3.	Plant Breeding. National Book Foundation,	Khan, M.A (Editor).
4.	Plant Pathology,	Agrios, G.N.
5.	A Text Book of Introductory Plant Pathology.	Ahmad, I. and A.R. Bhutta
6.	A Text Book of Plant Pathology	A.V.S.S. Sambamurti
7.	The Principles of Agronomy.	Harris, Franklin Stewart