

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. 07/2022

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
1.	101/2022	Assistant Private Secretary (BS-16) in different Ministries/ Divisions/ Department	i. Second Class or Grade 'C' Bachelor's degree from a University recognized by HEC. ii. Minimum shorthand speed: 100 w.p.m. and typing speed: 50 w.p.m. iii. Must be computer literate.	<ul style="list-style-type: none"> • Typing Test with minimum Speed of 50 W.P.M • Shorthand Test with minimum Speed of 100 W.P.M • Computer Literacy Test: <ul style="list-style-type: none"> i Microsoft Word (Typing, Formatting) ii Microsoft Excel (Typing, Graph, Calculations) iii Microsoft Power Point (Typing, Formatting, Inserting Objects) 	35 Marks 35 Marks 10 Marks 10 Marks 10 Marks
2.	102/2022	Junior Ordnance Management Officer (JOMO) , (BS-16), OS Directorate, Ministry of Defence.	i). Second Class or Grade 'C' Bachelor's degree or equivalent from a University recognized by HEC. ii). Two (2) years post qualification experience in Store Management.	Objective Type Test (MCQ) <u>Part-I</u> English =20 marks <u>Part-II</u> Mathematics & Accounting=20 marks <u>Part-III</u> General Intelligence/ Professional Test=60 marks	<u>Part-I</u> Grammar Usage, Sentence Structuring <u>Part-II</u> <ul style="list-style-type: none"> • Basic Arithmetic <ul style="list-style-type: none"> – Ratios – Percentages – Arithmetic Means • Basic Accounting <u>Part-III</u> <ul style="list-style-type: none"> • Current Affairs. <ul style="list-style-type: none"> – Issues/Challenges at National and International Level during the last 1 year • Basic Level knowledge of Pakistan Affairs & Islamic Studies • Knowledge of I.T with reference to Microsoft Excel & preparation of spreadsheets • Inventory Tracking & Auditing • Controlling, verifying & Reporting Stock • Inventory & Supply Chain in a Warehouse. • Warehouse layout • Fire Fighting <ul style="list-style-type: none"> – Classification of fires – Principles of heat transmission and Fire spread. – Common causes & consequences of fire – Various fire prevention methods • Care and preservation of Arms, Ammunition etc.

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
3.	103/2022	Junior Scientific Officer (JSO) (BS-16), O.S Directorate, GHQ, Ministry of Defence.	Second Class or Grade 'C' B. Tech (Textile/ Mechanical) or equivalent qualification from a University recognized by the HEC.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II Subject Test = 80 marks Note: Separate papers for candidates of Mechanical and Textile as there is no commonality in these disciplines. Moreover, job description of the post is entirely different from the educational qualification required for the post.	Part-I Sentence Structuring, Grammar Usage Part-II (For B. Tech. Textile candidates) <ul style="list-style-type: none"> • General textile technology, • Spinning, Weaving, • Dyeing and finishing, • Testing and quality control, • Fabric design and structure, • Business management and industrial economics, • Industrial management and human relations. Part-II (For B. Tech. Mechanical candidates) <ul style="list-style-type: none"> • Heat Transfer • Thermodynamics • Industrial Materials • Machine Design and Drawing • Mechanics of Machines • Workshop Technology • Hydraulic Machines
4.	104/2022	Statistical Officer (BS-17), Medical Directorate General Headquarters, Ministry of Defence.	i). Second Class or Grade 'C' Master's degree in Statistics/ Economics with Statistics/ Mathematics with Statistics. ii). Two (2) years post qualification experience in Statistical 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"> • Presentation of Data, • Measures of Central Tendency, • Measures of Dispersion, • Index Numbers, • Simple Regression and Correlation, • Time Series Analysis, • Sampling Techniques, • Testing of Hypothesis, • Techniques of Research, • I.T Knowledge of different statistical software commonly used in Pakistan
5.	105/2022	Social Welfare Officer , (BS-17), Armed Forces Institute of Rehabilitation Medicine (AFIRM), Ministry of Defence.	Master in Social Work 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"> • Community Organization and Development, • Social Research & Statistics, • Organizational Behaviour and Human Resources, • Social Welfare Policy and Administration, • Methods of Counselling & Guidance Services • Environmental Sociology • Health Policy of the Government. • Rehabilitation and placement of disable patients • Vocational Therapy techniques for disable patients

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6.	106/2022	<p>Lecturer (Male) (BS-17),</p> <p>A. Arabic B. Biology C. Botany D. Business Administration E. Chemistry F. Information Technology G. Economics H. English I. Fine arts J. Health & Physical Education K. History L. Home Economics M. International Relations N. Islamic Studies O. Mathematics P. Pak Studies Q. Physics R. Political Science S. Psychology T. Sociology U. Statistics V. Urdu W. Zoology</p> <p>Federal Government Educational Institutions (FGEI) Directorate, (Cantts/ Garrisons), Colleges, Ministry of Defence.</p>	<p>Second Class or Grade 'C' Master's Degree or equivalent qualification 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 Arabic and Urdu), English part will be of 10 marks. There will be 60 marks for subject Test and 30 marks for Professional Test. 	<p>A. For Arabic</p> <p>Part-I (10 Marks) Vocabulary, Grammar Usage, Sentence Structuring</p> <p>Part-II (Master's Level) (60 Marks)</p> <ul style="list-style-type: none"> • History of Arabic literature • Arabic Poetry at the Dawn of Islam • Arabic Syntax • Arabic Vocabulary, • Arabic Grammar usage, • Arabic Sentence Structure <p>Part-III (30 Marks)</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy <hr/> <p>B. For Biology</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring.</p> <p>Part-II (Masters Level)</p> <ul style="list-style-type: none"> • Theories of Evolution, • Multiple Alleles, • Nucleic Acids, • Cell Division, • Nutrition, • Ecosystem, • Mendelian laws of inheritance, • Diagnostic Characteristics of all the phyla or invertebrates and chordates, • Division of Plants <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy

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					<p>C. <u>For Botany</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"> • Algae, • Fungi, • Bryophytes • Gymnosperms, • Angiosperms, • Plant Physiology, • Ecology, • Cytology, • Genetics, <p><u>Part-III</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy
					<p>D. <u>For Business Administration</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"> • Business Finance • Principles of Management • Business Law • Business Research Methods • Financial Management • Marketing Management • Production/Operation Management • Management Information System <p><u>Part-III</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology, • Classroom Management and Discipline, • Testing and Evaluation, • Knowledge of Bloom's Taxonomy

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
					<p>E. For Chemistry</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring.</p> <p>Part-II (Masters Level)</p> <ul style="list-style-type: none"> • Nature, Properties & States of Matter, • Electronic Structure, • Bonding, • Chemical Kinetics & Radioactivity, • Synthetic Chemistry • Polymers, • Reaction Mechanism (electrophilic & nucleophilic substitution and addition reaction) • Inorganic Chemistry, • Thermodynamics, • Chemical Equilibrium, • Electrochemistry, • Solutions and Colloidal State. <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology, • Classroom Management and Discipline, • Testing and Evaluation, • Knowledge of Bloom's Taxonomy <hr/> <p>F. For Information Technology</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring.</p> <p>Part-II (Masters Level)</p> <ul style="list-style-type: none"> • Data Communication & Networking, • C/C++ Language, • Visual Basic, • Operating System Unix/Linux • Oracle/PLSQL, • System Analysis & Design, • Computer Architecture, • Operating System concepts, • Software Engineering, • Security and Ethical issues • Data Structures, • Management Information System, • Web Programming, <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
					<p>G. <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 • Knowledge of Bloom's Taxonomy <p>H. <u>For English</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"> • Linguistics. • 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-III</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology, • Classroom Management and Discipline, • Testing and Evaluation • Knowledge of Bloom's Taxonomy

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
					<p>I. <u>For Fine Arts</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"> • History of Art, Design & Architecture • Elements of Art • Drawing & Design Theory • Linear Perspective • Elements & Principles of Image Making • Painting: Basic elements of Art, concepts, media and formats. • Printmaking: Basic elements of art and design principles, concepts, media, and formats. <p><u>Part-III</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy <p>J. <u>For Health & Physical Education</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"> • Philosophy of Physical Education, • Psychology of Physical Education, • Rules of games • Basics of Human Anatomy • Administrative and Management in Sports, • Sports Nutrition, • Trauma and Rehabilitation, • Research Methodology in Physical Education • Test, Measurement and Evaluation in Physical Education & Sports • Sports Injuries, • Sports with physical disabilities <p><u>Part-III</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy

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					<p>K. <u>For History</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"> • The Prophetic Age (570-632) • The Pious Caliphate (632-660) • Political System of Islam under the Prophet (PBUH) and the Pious Caliphate (Nature of Islamic State, Form of Govt, Function of Islamic State, Caliphate Shura or the Consultative body and its role) • Institutional Development of the Muslim Civilisation (Umayyad, Abbasid, Crusade) • Muslim Freedom Movement in India (1857-1947) • Ideology of Pakistan • The Kashmir Issue • Pakistan and Neighbouring Countries • Research Methodology & Philosophy of History <p><u>Part-III</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy <p>L. <u>For Home 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"> • Introduction to Home Economics • Fundamentals of Food and Nutrition • Nutrition Health and Prevention • Entrepreneurship for home based industry • House Keeping Management • Methods of Research in Home Economics • Childcare and Development Guidance • Family Problems and Intervention strategies <p><u>Part-III</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy

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					<p>M. For International Relations</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring</p> <p>Part-II (Masters Level)</p> <ul style="list-style-type: none"> • The Definition and Scope of International Relations. • Theories and Approaches in International Relations • Terrorism, Globalization, Revival of Multipolarity • International Financial Institution (IMF, World Bank, ADB, IDB) • India and Pakistan Relations • Kashmir Issue, • CPEC-Pakistan China Relationship • FATF- Impacts on Pakistan Economy • Nuclear: Role of IAEA, NPT, CTBT in Nuclear proliferation • International Regional Organizations: EU, ASEAN, SAARC. <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy <p>N. For Islamic Studies</p> <p>Part-I 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>

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					<p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy
					<p>O. For Mathematics</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring.</p> <p>Part-II (Masters Level)</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>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy
					<p>P. For Pakistan Studies</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring.</p> <p>Part-II (Masters Level)</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>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy

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					<p>Q. For Physics</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring.</p> <p>Part-II (Masters Level)</p> <ul style="list-style-type: none"> • Heat and Thermodynamics, • Waves and Optics, • Electrostatic, • Electricity and Magnetism, • Atomic and Modern Physics, • Nuclear Physics, • Basic Solid State Physics, • Basic Electronics, • Electrodynamics, • Mechanics <p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy
					<p>R. 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)

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					<p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy <p>S. For 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 • Knowledge of Bloom's Taxonomy <p>T. For Sociology</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring</p> <p>Part-II (Masters Level)</p> <ul style="list-style-type: none"> • Meaning 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 • Social Problems in Pakistan

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					<p>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology, • Classroom Management and Discipline, • Testing and Evaluation, • Knowledge of Bloom's Taxonomy <p>U. For Statistics</p> <p>Part-I Vocabulary, Grammar Usage, Sentence Structuring.</p> <p>Part-II (Masters Level)</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>Part-III</p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology • Classroom Management and Discipline • Testing and Evaluation • Knowledge of Bloom's Taxonomy <p>V. For Urdu</p> <p>Part-I (10 Marks) Vocabulary, Grammar Usage, Sentence Structuring.</p> <p>Part-II (Masters Level) (60 Marks)</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>اردو ذخیرہ الفاظ ☆</p> <p>اردو جملے کا ڈھانچہ ☆</p> <p>اردو قواعد کا استعمال ☆</p> <p>غالبیات ☆</p> <p>اقبالیات ☆</p> <p>مسدس جانی ☆</p> <p>میر تقی میر کی شاعری ☆</p> <p>طنز و مزاح: مشتاق احمد یوسفی کی نظر میں ☆</p> </div>

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					<p><u>Part-III (30 Marks)</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology, • Classroom Management and Discipline, • Testing and Evaluation, • Knowledge of Bloom's Taxonomy <p><u>W. For Zoology</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"> • 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><u>Part-III</u></p> <ul style="list-style-type: none"> • Teaching Techniques and Methodology, • Classroom Management and Discipline, • Testing and Evaluation, • Knowledge of Bloom's Taxonomy
7.	107/2022	Demonstrator (Male) (BS-16), Federal Government Educational Institutions (FGEI) Directorate, (Cantts/ Garrisons) Colleges, Ministry of Defence.	Second Class or Grade 'C' Master's degree in Physics/ Chemistry/ Biology.	Objective Type Test (MCQ) <u>Part-I</u> English = 20 marks <u>Part-II</u> General Science Test=80 marks	<p><u>Part-I</u> Grammar Usage, Sentence Structuring</p> <p><u>Part-II</u></p> <ul style="list-style-type: none"> • Physics: <ul style="list-style-type: none"> • Heat & Thermodynamics, • Electrostatics, • Electromagnetism, • Waves and Optics • Chemistry: <ul style="list-style-type: none"> • Thermodynamics, • Nature, Properties and States of Matter, • Gases, Liquids & Solids, • Organic Chemistry. • Biology: <ul style="list-style-type: none"> • Viruses & Algae • Bryophyte • Protozoa • Mollusca • Maintenance and Management of Science Laboratories.

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8.	110/2022	Dietitian (BS-16), Medical Directorate General Headquarters, Ministry of Defence.	B.Sc. Home Economics. OR B.Sc./ M.Sc. Human Nutrition/ Diet. OR B.Sc./ B.A with relevant Diploma as Hospital Diet. Technician/ Nutrition/ Food Production etc. OR B.Sc. with Human and Food Technology.	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"> • Fundamentals of Food & Nutrition • Principles of Diet Therapy. • Planning & Preparation of Balanced Diet. • Physiological aspect of Nutrition • Food Microbiology • Energy Value of Foods • Sanitation and Hygiene • Nutrition Health & Prevention
9.	111/2022	Research Officer (BS-17), Animal Quarantine Department, Ministry of National Food Security & Research.	D.V.M, B.Sc. (Animal Husbandry–Veterinarian) OR B.V.Sc.	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"> • Livestock Industry in Pakistan • Livestock Management Practices • Rangeland Management in Pakistan • Livestock & Poultry Diseases • Veterinary Medicines and Vaccines • Veterinary Microbiology/Virology • Veterinary Parasitology • Animal Nutrition/Physiology • Poultry, Sheep/Goat & Dairy Farming • Chemicals/Lab. Machines and their usage
10.	112/2022	Veterinary Officer (BS-17), Animal Quarantine Department, Ministry of National Food Security & Research.	D.V.M, B.Sc. (Animal Husbandry–Veterinarian) OR B.V.Sc.	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"> • Livestock Industry in Pakistan • Rangeland Management in Pakistan • Livestock & Poultry Diseases • Veterinary Medicines and Vaccines • Veterinary Surgery/Anatomy/Pharmacology • Veterinary Microbiology/Virology • Veterinary Parasitology • Animal Reproduction • Animal Nutrition/Physiology • Epidemiology • Procurement/ arrangement of Chemicals/Lab. Machines and their usage

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
11.	115/2022	Orientation and Briefing Officer (BS-16), Bureau of Emigration & Overseas Employment, Ministry of Overseas Pakistanis & Human Resource Development.	i). Second Class or Grade 'C' Bachelor's degree from a University recognized by the HEC. ii). Three (3) years post qualification experience in Labour/ Manpower and Overseas Employment Service/ Technical or Vocational Training/Planning/ Economic Development.	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"> Labour Laws of Gulf Countries Economic Situation of Pakistan Role of remittances and Impact of Immigrants in Pakistani Economy Emigration Ordinance and Rules, 1979 Illegal Migration, Human Trafficking Importance of Technical/Vocational Training for Immigrants Govt. Policies/Measures for Technical/Vocational Training Issues of Pakistani Migrant Workers Importance of pre-departure Orientation & Briefing for Intending Emigrants Knowledge of cultural diversity faced by the Overseas Pakistanis in host countries Knowledge of working methodology, work ethics etc. by the Overseas Pakistanis in host countries
12.	116/2022	Inspector (BS-16), Bureau of Emigration & Overseas Employment, Ministry of Overseas Pakistanis & Human Resource Development.	i). Second Class or Grade 'C' Bachelor's degree from a University recognized by the HEC. ii). Three (3) years post qualification experience in Labour/ Manpower and Overseas Employment Service/ Technical or Vocational Training/Planning/ Economic Development.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II Professional Test=40 marks Part-III Analytical Skills Test=40 marks	Part-I Grammar Usage, Sentence Structuring Part-II <ul style="list-style-type: none"> International Migration Convention 2003 Role of remittances and Impact of Immigrants in Pakistani Economy Emigration Ordinance and Rules, 1979 Issues of Pakistani Migrant Workers Part-III <ul style="list-style-type: none"> Reasonable Analytical Skills Conversant of Laws, Rules, SOPs etc. regarding Trade Test Centres for recruitment of workers Knowledge of Communication skills Knowledge of Interpersonal skills
13.	118/2022	Translator (BS-16), Ministry of Commerce.	i). Graduate. ii). Three (3) years post qualification experience in Government organizations in translation from English to Urdu and vice versa.	Subjective Test= 100 Marks Qualifying Threshold = 40 Marks	<ul style="list-style-type: none"> Paragraph Writing = 15 Marks Abridging a given paragraph= 15 Marks Translation of 2 short paragraphs from English to Urdu =2X15=30 Marks Translation of 2 short paragraphs from Urdu to English =2X15=30 Marks Translation of Urdu Sentences into English =5X2=10 Marks

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications/Experience for the Posts	Test Specification	Topics of Syllabi
14.	121/2022	Appraising/ Valuation Officer (BS-16), Revenue Division, Federal Board of Revenue. NOTE: At first stage MCQs Screening Test shall be held, then on the basis of its result top merit position holders @ ten candidates per vacancy from respective quotas would be called for Descriptive Test.	i). Second Class or Grade 'C' Bachelor's degree from a recognized University with Economics, Commerce, Statistics, Accounting, Computer Science, Law, Pharmacy, Chemistry or Physics as one of the subjects or B.Sc. Engineering in any speciality. ii). Computer literacy up to the level of MS Word, MS Power Point and MS Excel.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II General Intelligence=80 marks	Part-I Grammar Usage, Sentence Structuring Part-II • Basic Arithmetic – Algebra – Ratios – Percentages – Arithmetic Means • Current Affairs. – Issues/Challenges at National and International Level during the last 2 years – Basic Economic facts related to Pakistan. • Pakistan Affairs & Islamic Studies – Basic Level knowledge • Basic Computer Operation in MS Office Note : (Equal weightage for each topic at Part-II) Note: For Pre-selected candidate, syllabus for Descriptive Test is at Page-18 below
15.	122/2022	Preventive Officer (BS-16), Revenue Division, Federal Board Of Revenue. NOTE: At first stage MCQs Screening Test shall be held, then on the basis of its result top merit position holders @ ten candidates per vacancy from respective quotas would be called for Descriptive Test.	i). Second Class or Grade 'C' Bachelor's degree from a recognized university with Economics, Commerce, Statistics, Accounting, Computer Science, Law, Pharmacy, Chemistry or Physics as one of the subjects or B.Sc. Engineering in any speciality. ii). Computer literacy up to the level of MS Word, MS Power Point and MS Excel. iii). Minimum Physical Standard: (a) For Male candidates: Height 5'-6" Chest 32"-33.5" (b) For Female Candidates: Height 5'-2". (Documentary proof from authorized Medical authorities required).	Objective Type Test (MCQ) Part-I English = 20 marks Part-II General Intelligence Test = 80 marks	Part-I Grammar Usage, Sentence Structuring Part-II • Basic Arithmetic – Algebra – Ratios – Percentages – Arithmetic Means • Current Affairs. – Issues/Challenges at National and International Level during the last 2 years – Basic Economic facts related to Pakistan. • Pakistan Affairs & Islamic Studies – Basic Level knowledge • Basic Computer Operation in MS Office Note : (Equal weightage for each topic at Part-II) Note: For Pre-selected candidate, syllabus for Descriptive Test is at Page-18 below

Syllabus for Descriptive Test of
F.4-121/2022-R (Appraising/Valuation Officer (BS-16)) &
F.4-122/2022 (Preventive Officer (BS-16))

Max Marks: 100

Qualifying Standard 40%

Time Allowed: 3 Hours

Part-I (English Essay): 40 Marks

Candidates will be required to write an Essay in English comprising **1000 words** from a set of **four given topics**. Candidates are expected to reflect comprehensive knowledge on a selected topic. Candidate's articulation, expression and technical approach to the style of English Essay writing will be examined.

Part-II (Current Affairs): 30 Marks

Candidates will be expected to demonstrate knowledge on current affairs related to the following:

- CPEC and Pakistan,
- Kashmir Issue,
- Pak US relations
- Afghanistan Crisis
- Basic Economic facts related to Pakistan

Part-III (Islamic Studies/Pakistan Studies): 30 Marks

I. Islamic Studies

Introduction to Islam, Seerah of the Prophet Muhammad (PBUH) as Role Model, Status of Woman in Islam, Articles of Faith, Islamic Code of Life, Islamic Concept of Human Rights

II. Pakistan Studies

Parliamentary democracy in Pakistan under 1973 Constitution, Salient features of the Constitution of Pakistan 1973, Economic Challenges for Pakistan, Major social problems of Pakistan.

SUGGESTED READINGS

S.No.	Title	Author
1.	Pakistan and World Affairs	Shamshad Ahmad (Edition-2015)
2.	Constitution of Pakistan 1973	
3.	Kashmir in Conflict: India, Pakistan and the Unending War.	Schofield, Victoria. New York: I.B.Tauria, 2003.
4.	Modern South Asia: History, Culture, Political Economy.	Jalal, Aisha and Bose, Sugata. New York: Routledge, 1998.
5.	Federalism and Ethnic Conflict Regulation in India and Pakistan.	Adeney, Katharine. , New York: Palgrave Macmillan, 2007.
6.	Issues in Pakistan's Economy	S. Akbar Zaidi
7.	Economic Survey of Pakistan	Government Publication
For Islamic Studies		
8.	Introduction to Islam	Dr. Hamidullah
9.	Islam: its meaning and Message	Khurshid Ahmad
10.	Insan e Kamil	Dr Khalid Alvi
11.	Islami Tehzeeb Kay Chund Darakhshan Pehloo	Mustafa Sabali

Schemes and Syllabi for Written Examination (Descriptive) for All Posts in BS-18 & BS-19 included in Consolidated Advertisement No. 07/2022

PAPER-I: ENGLISH

Max Marks: 100

Time Allowed: 3 Hours

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

SUGGESTED READINGS

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

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

Case No.	F.4-108 (A)/2022-R
Particulars of post	Assistant Professor (Female) (Business Administration) (BS-18) , Federal Government Educational Institution Directorate, (Cantt./ Garrison) Colleges, Ministry of Defence.
Minimum Qualification & Experience:	Ph.D. degree in the relevant subject with one (1) year post qualification teaching experience at College/ University level. OR M. Phil. degree in the relevant subject with three (3) years post qualification teaching experience at College/ University level. OR Second Class or Grade 'C' Master's degree in the relevant subject with five (5) years post qualification teaching experience at College/ University level.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II & III.

Part-II: (Business Administration) (Subjective)**50 Marks****I. Introduction to Management**

- Introduction to Management
- The History and evaluation of Management
- Organizational theories and different approaches to management
- Foundations and basic elements of Planning
- Effective strategic planning
- Decision Making
- Decision making process
- Strategic management process

II. Financial Accounting

- Accounting for companies
- Accounting for Issuance of shares
- Company final Accounts
- Accounting for Dividends
- Accounting for Bonds and Debentures
- Preparation and Interpretation of Cash Flow
- Important IAS and FRS
- Analysis of Financial Statements
- Accounting for consolidated statements.

III. Introduction to HRM

- Meeting present human resource requirements
- Emerging Human resource management challenges.
- Trends in HRM
- Global vs local HRM practices
- HRM from Islamic and indigenous perspective
- Basic Islamic philosophy of managing human resource
- HR Planning

IV. Marketing Management

- Marketing: An Overview
- Marketing Information Systems.

- Consumer Markets and Consumer Behavior Analysis
- STP Marketing
- Product Markets Strategies
- Pricing Strategies and Policies
- Marketing Channel Decisions

Part-III (Professional) (Subjective) : 25 Marks

I. Development of Curriculum and Instructional Material

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

II. Process of Teaching and Teaching Strategies

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

III. Educational Assessment and Evaluation

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

IV. Research Methods in Education

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

SUGGESTED READINGS

S.No.	Title	Author
1.	Management	Mary Coulter & Robbins
2.	Managing Human Resources.	Luis R. Gomez Mejia, David B. Balkin, Robert L. Cardy
3.	Financial & Managerial Accounting,	Williams, Haka, Bettner:
4.	Financial Accounting	Professor Muhammad Ammanullah Khan
5.	Marketing Management, Analysis, Planning, Control	Philip Kotler,
6.	Fundamentals of Marketing	William J. Stanton & Charles Futrell
7.	Research in Education	JW Best
8.	Integrating Education Technology into Teaching	Roblyer
9.	Curriculum Development	S.M. Shahid
10.	Educational Measurement and Evaluation	S.M. Shahid
11.	Educational Administration	S.M. Shahid

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

Case No.	F.4-108 (B)/2022-R
Particulars of post	Assistant Professor (Female) (Computer Science) (BS-18) , Federal Government Educational Institution Directorate, (Cantt./ Garrison) Colleges, Ministry of Defence.
Minimum Qualification & Experience:	Ph.D. degree in the relevant subject with one (1) year post qualification teaching experience at College/ University level. OR M. Phil. degree in the relevant subject with three (3) years post qualification teaching experience at College/ University level. OR Second Class or Grade 'C' Master's degree in the relevant subject with five (5) years post qualification teaching experience at College/ University level.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II & III.

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

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

II. Object Oriented Programming

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

III. Data Structure and Algorithms

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

IV. Database Management Systems

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

V. Computer Communications and Networks

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

VI. Operating Systems

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

Part-III (Professional) (Subjective) : 25 Marks

- I. Development of Curriculum and Instructional Material**
 - Elements of Curriculum.
 - Curriculum Development Process: Need Assessment, Formulation of Aims and Objectives, Taxonomies of Educational Objectives, Selection of Content, Development of Curricular Materials.
- II. Process of Teaching and Teaching Strategies**
 - Process of Classroom Communication
 - Factors affecting Classroom Communication
 - Barriers to Classroom Communications
 - Use of Instructional Materials and Media
- III. Educational Assessment and Evaluation**
 - Concept of Classroom Assessment and Evaluation
 - Distinction between Assessment, Evaluation and Measurement
 - Approaches to Evaluation: Formative Evaluation; Summative Evaluation
 - Types of Test: Essay Type; Objective Type: Multiple Choice, True-False Items, Matching Type; Principles of Construction of these Test
 - Characteristics of a Good Test: Validity, Reliability, Objectivity, Usability
- IV. Research Methods in Education**
 - Research Instruments: Questionnaire: Interview; Test; Observation; Rating Scale
 - Research Proposal and Report Writing.

Suggested Reading

S.No.	Title	Author
1.	Modern Operating Systems	Andrew S. Tanenbaum
2.	Operating System Concepts	Addison-Wesley
3.	Algorithms and Data Structures	N. Wirth
4.	Data structures	Aaron M. Tanenbaum,
5.	Database Systems: A Practical Approach to Design, Implementation and Management	R.Connolly and P.Begg
6.	Introduction to Computer Networks	A. S. Tanenbaum
7.	Computer Networks and Internets	Douglas E. Comer
8.	Computer Architecture: A Quantitative Approach	Hennessy & Patterson
9.	Research in Education	JW Best
10.	Integrating Education Technology into Teaching	Roblyer
11.	Curriculum Development	S.M. Shahid
12.	Educational Measurement and Evaluation	S.M. Shahid
13.	Educational Administration	S.M. Shahid

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

Case No.	F.4-108 (C)/2022-R
Particulars of post	Assistant Professor (Female) (Economics) (BS-18), Federal Government Educational Institution Directorate, (Cantt./ Garrison) Colleges, Ministry of Defence.
Minimum Qualification & Experience:	Ph.D. degree in the relevant subject with one (1) year post qualification teaching experience at College/ University level. OR M. Phil. degree in the relevant subject with three (3) years post qualification teaching experience at College/ University level. OR Second Class or Grade 'C' Master's degree in the relevant subject with five (5) years post qualification teaching experience at College/ University level.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II & III.

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

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

II. Macro Economics

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

III. Public Financing

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

IV. Role of Foreign Trade and Aid in Economic Development

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

V. Major Issues in Pakistan Economy

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

Part-III (Professional) (Subjective) : 25 Marks

- I. Development of Curriculum and Instructional Material**
 - Elements of Curriculum.
 - Curriculum Development Process: Need Assessment, Formulation of Aims and Objectives, Taxonomies of Educational Objectives, Selection of Content, Development of Curricular Materials.
- II. Process of Teaching and Teaching Strategies**
 - Process of Classroom Communication
 - Factors affecting Classroom Communication
 - Barriers to Classroom Communications
 - Use of Instructional Materials and Media
- III. Educational Assessment and Evaluation**
 - Concept of Classroom Assessment and Evaluation
 - Distinction between Assessment, Evaluation and Measurement
 - Approaches to Evaluation: Formative Evaluation; Summative Evaluation
 - Types of Test: Essay Type; Objective Type: Multiple Choice, True-False Items, Matching Type; Principles of Construction of these Test
 - Characteristics of a Good Test: Validity, Reliability, Objectivity, Usability
- IV. Research Methods in Education**
 - Research Instruments: Questionnaire: Interview; Test; Observation; Rating Scale
 - Research Proposal and Report Writing.

SUGGESTED READINGS

S. No.	Title	Author
1.	A Text-book of Economics Theory	Stonier & Hague
2.	Government Finance—An Economic Analysis	Due John, F.
3.	Microeconomic	Ferguson, C.E. & Gould, J.P., Nicholson, Mankiw
4.	Macroeconomics	Rudigar Dorubush and Stanley Fisher Blanchard
5.	Foreign Aid Theory and Practice in Southern Asia	Wolf, Jr. DC
6.	History of International Trade	Findlay, R and O' Rourke, K
7.	Research in Education	JW Best
8.	Integrating Education Technology into Teaching	Roblyer
9.	Curriculum Development	S. M. Shahid
10.	Educational Measurement and Evaluation	S. M. Shahid
11.	Educational Administration	S. M. Shahid

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

Case No.	F.4-108 (D)/2022-R
Particulars of post	Assistant Professor (Female) (English) (BS-18), Federal Government Educational Institution Directorate, (Cantt./ Garrison) Colleges, Ministry of Defence.
Minimum Qualification & Experience:	Ph.D. degree in the relevant subject with one (1) year post qualification teaching experience at College/ University level. OR M. Phil. degree in the relevant subject with three (3) years post qualification teaching experience at College/ University level. OR Second Class or Grade 'C' Master's degree in the relevant subject with five (5) years post qualification teaching experience at College/ University level.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II & III.

Part-II: (English) (Subjective)**50 Marks****I. Essays:**

- Bertrand Russell (The Conquest of Happiness)
- George Orwell (Politics and the English Language; The Prevention of Literature)
- Ralph Waldo Emerson (The Transcendentalist; Self-reliance)

II. Short Stories:

- Somerset Maugham (The Lotus-eater)
- G.K.Chesterton (A Somewhat Improbable Story)
- O'Henry (The Gift of the Magi)

III. Poetry:

- William Wordsworth (Resolution Independence; Tintern Abbey)
- John Keats (Ode to a Nightingale; Ode to Autumn)
- Lord Alfred Tennyson (Ulysses; The Lady of Shalott)
- Yeats (A Dialogue of Self and Soul; The Second Coming)
- Eliot (The Wasteland; Love Song of J. Alfred Prufrock)
- Philip Larkin (Maturity; Continuing to Live; The Trees)
- Wallace Stevens (A postcard from the volcano; Continual conversation with a silent man; Dry loaf) **OR** Walt Whitman (As I ponder'd in silence; Are you the new person drawn toward me?; This moment yearning and thoughtful)

IV. Drama:

- Shakespeare (*Hamlet; King Lear, As you like it and 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*)

V. Novels:

- Thomas Hardy (*Far from the Madding Crowd*)
- D.H. Lawrence (*Sons and Lovers*)
- George Orwell (*Nineteen Eighty-four*)
- James Joyce (*A Portrait of the Artist as a Young Man*)
- Iris Murdoch (*Under the Net*)
- Nathaniel Hawthorne (*The Scarlet Letter*) or William Faulkner (*The Sound and the Fury*)

VI. Literacy Theory & Criticism

- Structuralism
- Marxism
- Deconstructionism
- Psychoanalytic criticism
- Feminist criticism
- Postcolonial Criticism

Part-III (Professional) (Subjective) : 25 Marks

I. Development of Curriculum and Instructional Material

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

II. Process of Teaching and Teaching Strategies

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

III. Educational Assessment and Evaluation

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

IV. Research Methods in Education

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

SUGGESTED READINGS

S.No.	Title	Author
1.	The basics Literary Theory. (Second edition). Routledge.	Bertens, H. (2008).
2.	Literary Theory: An Introduction. (Anniversary Edition).	Eagleton, E. (2008).
3.	A New Handbook of Literary Terms.	Mikics, W. (2007).
4.	A Companion to Twentieth Century Poetry.	Roberts, N. (2003).
5.	A Reader's Guide to Contemporary Literary Theory. (Fifth edition).	Selden, R., Widdowson, P., & Brooker, P. (2005)
6.	Twentieth Century British Drama.	Smart, J. (2001).
7.	Modern Critical Views & Interpretations, ed: 80's and 90's editions.	Harold Bloom
8.	A Companion to 20 th Century Drama Oxford: Blackwell.	Krasner David. 2005.
9.	Research in Education	JW Best
10.	Integrating Education Technology into Teaching	Roblyer
11.	Curriculum Development	S. M. Shahid
12.	Educational Measurement and Evaluation	S. M. Shahid
13.	Educational Administration	S. M. Shahid

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

Case No.	F.4-108 (E)/2022-R
Particulars of post	Assistant Professor (Female) (Mathematics) (BS-18), Federal Government Educational Institution Directorate, (Cantt./ Garrison) Colleges, Ministry of Defence.
Minimum Qualification & Experience:	Ph.D. degree in the relevant subject with one (1) year post qualification teaching experience at College/ University level. OR M. Phil. degree in the relevant subject with three (3) years post qualification teaching experience at College/ University level. OR Second Class or Grade 'C' Master's degree in the relevant subject with five (5) years post qualification teaching experience at College/ University level.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II & III.

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

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

II. Statics

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

III. Dynamics

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

IV. Ordinary differential equations

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

V. Fourier series and partial differential equations

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

VI. Numerical Methods

- Solution of nonlinear equations by bisection, secant and Newton-Raphson methods; the fixed- point iterative method; order of convergence of a method.

- Solution of a system of linear equations; diagonally dominant systems; the Jacobi and Gauss-Seidel methods.
- Numerical solution of an ordinary differential equation; Euler and modified Euler methods; Runge- Kutta methods.

Part-III (Professional) (Subjective) : 25 Marks

I. Development of Curriculum and Instructional Material

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

II. Process of Teaching and Teaching Strategies

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

III. Educational Assessment and Evaluation

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

IV. 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.	F.4-108 (F)/2022-R
Particulars of post	Assistant Professor (Female) (Psychology) (BS-18), Federal Government Educational Institution Directorate, (Cantt./ Garrison) Colleges, Ministry of Defence.
Minimum Qualification & Experience:	Ph.D. degree in the relevant subject with one (1) year post qualification teaching experience at College/ University level. OR M. Phil. degree in the relevant subject with three (3) years post qualification teaching experience at College/ University level. OR Second Class or Grade 'C' Master's degree in the relevant subject with five (5) years post qualification teaching experience at College/ University level.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II & III.

Part-II: (Psychology) (Subjective) 50 Marks

- I. **Nature and Scope of Psychology:** Definition and scope, Psychology as a Science, Schools, Perspectives, and Models of Psychology, Recent Trends
- II. **Biological Basis of Behaviour:** Nervous System, Neuron and its function, Central and Peripheral Nervous System, Endocrine System
- III. **Motivation and Emotion:** Homeostasis, Factors affecting Motivation, Biogenic and Social Motives, Measurement of Human Motivation, Theories of Motivation, Emotions, Types of Emotions, Physiological changes and Emotion, Theories of Emotion.
- IV. **Personality:** Determinants of Personality, Factors in Development of Personality, Theoretical Perspectives, Traits and Types, Personality Assessment and Techniques, Cross-Cultural Issues.
- V. **Intelligence:** Theories of Intelligence, Types of intelligence (IQ, EQ), Assessing Intelligence
- VI. **Developmental Psychology:** Physical, Cognitive, Social and Emotional development in Childhood, Adolescence, Adulthood and Old Age
- VII. **Abnormal and Clinical Psychology:** Concept and causes of Abnormality, Clinical Assessment and Intervention, Different disorders such as Schizophrenia, Mood disorders, Anxiety disorders, Personality disorders, etc. Psychological treatment including different Therapeutic techniques.

Part-III (Professional) (Subjective) : 25 Marks

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

II. Process of Teaching and Teaching Strategies

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

III. Educational Assessment and Evaluation

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

IV. Research Methods in Education

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

SUGGESTED READINGS

S. No.	Title	Author
1.	Introduction to Psychology	Atkinson R. C., & Smith, E. E
2.	Development Across the Life Span	Feldman, R.
3.	Abnormal Psychology	Kring, A. M
4.	Psychology	Myers, D. G.
5.	An introduction of theories of personality	Ewen, R. B.
6.	Research in Education	JW Best
7.	Integrating Education Technology into Teaching	Roblyer
8.	Curriculum Development	S.M. Shahid
9.	Educational Measurement and Evaluation	S.M. Shahid
10.	Educational Administration	S.M. Shahid

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

Case No.	F.4-108 (G)/2022-R
Particulars of post	Assistant Professor (Female) (Sociology) (BS-18), Federal Government Educational Institution Directorate, (Cantt./ Garrison) Colleges, Ministry of Defence.
Minimum Qualification & Experience:	Ph.D. degree in the relevant subject with one (1) year post qualification teaching experience at College/ University level. OR M. Phil. degree in the relevant subject with three (3) years post qualification teaching experience at College/ University level. OR Second Class or Grade 'C' Master's degree in the relevant subject with five (5) years post qualification teaching experience at College/ University level.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II & III.

Part-II: (Sociology) (Subjective)**50 Marks**

1. **Social Interaction:** Caste and classes, Forms of social classes, Feudal system in Pakistan, Social Mobility-nature of social mobility and its determinants in Pakistani society, Culture of poverty.
2. **Social Control:** Mechanisms of social control-formal and informal means of social control, Anomie, Alienation and social Integration-Means of social integration in Pakistani Society.
3. **Social and Cultural Change and Social Policy:** Processes of Social and Cultural Change-discovery, Inhibitions to social and cultural change in Pakistan, Social planning and directed social and cultural change, Effect of Industrialization, Urbanization, Modernization and Modern Means of Communication on Social Change.
4. **Public Opinion:** Formulation of public opinion, concept of opinion leader, characteristics of opinion leadership.
5. **Community:** The rural community, Traditional Characteristics of rural life, The urban community, Rural – Urban convergence, Urbanism, Future of cities in Pakistan.
6. **Social Institutions:** The nature and genesis of institutions, The process of institutionalization, Functions of Social Institutions: Family, Religion, Education, Economy and Politics.
7. **Social Problems in Pakistan:** High population growth rate, Rural –urban migration. Issues of technical/vocational training, Deviance and street crime, Unemployment, illiteracy and School drop out, Smuggling, Prostitution, Poverty, Drug Addiction, Child Labour and Abuse, Bonded Labour, Social customs and

Traditions affecting Women in Pakistan, Violence Against Women and Domestic Violence, Issues concerning the Elderly in Pakistan.

8. **Methods of Sociological Research:** Scientific Method, Steps in research, Types of Questionnaire Research Design, Surveys, Observation and Case Studies.

Part-III (Professional) (Subjective) : 25 Marks

- I. Development of Curriculum and Instructional Material**
- Elements of Curriculum.
 - Curriculum Development Process: Need Assessment, Formulation of Aims and Objectives, Taxonomies of Educational Objectives, Selection of Content, Development of Curricular Materials.
- II. Process of Teaching and Teaching Strategies**
- Process of Classroom Communication
 - Factors affecting Classroom Communication
 - Barriers to Classroom Communications
 - Use of Instructional Materials and Media
- III. Educational Assessment and Evaluation**
- Concept of Classroom Assessment and Evaluation
 - Distinction between Assessment, Evaluation and Measurement
 - Approaches to Evaluation: Formative Evaluation; Summative Evaluation
 - Types of Test: Essay Type; Objective Type: Multiple Choice, True-False Items, Matching Type; Principles of Construction of these Test
 - Characteristics of a Good Test: Validity, Reliability, Objectivity, Usability
- IV. Research Methods in Education**
- Research Instruments: Questionnaire: Interview; Test; Observation; Rating Scale
 - Research Proposal and Report Writing.

SUGGESTED READINGS

S. No.	Title	Author
1.	Sociology : A down to earth approach	James M. Henslin
2.	Methods of Social Research	Baily
3.	Poverty Curtains	Dr. Mehboob-ul-haq
4.	Sociology	Ogburn & Nimkoff
5.	Feudal System in Pakistan	Nawab Haider Naqvi
6.	Sociology: An Introduction to the Science of Society	Koening Samuel
7.	The Design of Social Research,	Ackoff, Russel, L.
8.	An Introduction to the History of Sociology	Barnes, H.E. (Ed.)
9.	Research in Education	JW Best
10.	Integrating Education Technology into Teaching	Roblyer
11.	Curriculum Development	S.M. Shahid
12.	Educational Measurement and Evaluation	S.M. Shahid
13.	Educational Administration	S.M. Shahid

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

Case No.	F.4-109/2022-R
Particulars of post	Deputy Armament Supply Officer (BS-18) , Naval Headquarters, 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.	F.4-113/2022-R
Particulars of post	Deputy Scientific Adviser (BS-19) , Ministry of Science & Technology.
Minimum Qualification & Experience:	i). Second Class or Grade 'C' M.Sc. in Natural Sciences or equivalent qualification from University recognized by HEC. ii). Twelve (12) years post qualification experience in Research & Development/ Science & Technology Management.

Part-I: 25 Marks (MCQ)

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

Part-II: (Research and Planning) 25 Marks (Descriptive)**I. Communication Skills, Technical Writing and Presentation Skills**

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

II. Planning and Managementa) 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.

Part-III: 25 Marks (Descriptive)
(General Science)**I. Basic Inorganic Chemistry**

Types of chemical bonding, ionic and covalent bonding, localized bond approach, theories of chemical bonding, valence bond theory (VBT), hybridization and resonance, prediction of molecular shapes using valence-shell electron-pair repulsion (VSEPR) model, Molecular orbital theory (MOT) applied to diatomic molecules, delocalized approach to bonding, bonding in electron deficient compounds, hydrogen bonding.

II. Metabolism

Digestion; absorption and transport of proteins, carbohydrates, lipids and nucleic acids. Glycolysis; citric acid cycle, gluconeogenesis, glycogenesis, glycogenolysis and photosynthesis.

Biosynthesis of triglycerides, phosphides, steroids and bile acids and ketone bodies.

Biochemical reaction of amino acids: decarboxylation, deamination, transamination and transmethylation, etc., urea cycle, creatine and uric acid synthesis.

Catabolism of nucleosides, DNA polymerases and other enzymes involves in metabolism.

III. Mechanics

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.

IV. Modern and Quantum Physics

Waves and particles and De Broglie's Hypothesis; Operators and quantum states; observables; time dependent and independent Schrodinger equation; angular momentum; spin-1/2 particle in a magnetic field; wave mechanics; particle in a box; tunneling; one-dimensional harmonic oscillator; Heisenber's uncertainty relationship and indeterminacy based on commutation properties of operators; Bohr's theory and quantum numbers including electron spin; Pauli's exclusion principle; Spectra of simple systems with one or two valence electrons; photo electric effect; Compton scattering; pair production; Lande's g factor and Zeeman effect. Raman effect;

Part-IV: 25 Marks (Descriptive)

(Geology, Astronomy & Human Resource 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.

II. Basic concepts of Geology

Plate tectonics: Types of plates boundaries and related phenomenon. Mountain building (orogenic) processes. Tectonics of Pakistan: mountains and related landforms in Pakistan. Types of tectonic stresses forming these landforms, Topographic maps: Identification of different features on topographic maps and different types of maps, Geophysics: earthquakes, seismic waves and related hazards. Composition of internal part of earth.

SUGGESTED READINGS

S. No.	Title	Author
1.	Practical English Grammar	A.J. Thomson and A.V. Martinet.
2.	Reading. Advanced	Brian Tomlinson and Rod Ellis.
3.	Study Skills	Richard Yorkey
4.	Writing. Advanced	Ron White.
5.	College Writing Skills	John Langan.
6.	Project Management Body of Knowledge	Project Management Institute (PMI) standards committee
7.	Software Project Management	S.A. Kelkar, A Concise Study, Prentice Hall of India.
8.	Textbook of Inorganic Chemistry 2013	Chaudhary, S. U.
9.	Stereochemistry (Basic Concepts in Chemistry)	Morris, D. G.
10.	Perspectives of Modern Physics.	A. Beiser.
11.	Introduction to Quantum Mechanics	D. Griffiths
12.	Human Resource Management	H.T. Graham & Roger Bennett
13.	Management	James A.F. Stoner, R. Edward Freeman, Daniel R. Gilbert Jr.
14.	Governance	Anne Mette Kjær
15.	Plate Tectonics – Geodynamics	Moores, E.M. & Twiss, R.J

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

Case No.	F.4-114/2022-R
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/ Electronic or equivalent qualification from a University recognized by HEC.</p> <p style="text-align: center;">OR</p> <p>Second Class or Grade 'C' BE/ 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)

(General Science)

I. Mechanics

Vectors - Dots, Cross and triple products, Gradient, divergence and applications. Newtonian laws of motion; conservation law of energy; conservation of linear and angular momentum; Dynamics of rigid body; spin and precession; gyroscope; Gravitation; planetary motion including satellite. 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 Van der Waals equation; Three Laws of Thermodynamics, 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 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.

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. Electronics

Thermionic emission; Space charge: Diode. Triode Tetrode; Pentode and their static and dynamic characteristics; Amplitude modulation and demodulation or detection. Various basic circuits for rectification, amplification modulation and detection connected with radio receivers and transmission; n and p type semiconductors; Biased function; Transistors; Common base and common emitter configurations.

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

I. Communication Skills, Technical Writing and Presentation Skills

Paragraph writing, Essay writing, Translation 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.

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 Scharton.

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

Case No.	F.4-117/2022-R
Particulars of post	Assistant Inspector General (Forest) (BS-18) , Ministry of Climate Change.
Minimum Qualification & Experience:	i). Second Class or Grade 'C' B.Sc. (Hons) Forestry/ M.Sc. (Forestry). ii). Five (5) years post qualification experience in the field of Forestry and wildlife.

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II.

Part-II: (Forestry) 75 Marks (Descriptive)**I. Definition of Forestry**

- National Definition of Forestry (Pakistan)
- National Definition of Deforestation (Pakistan)
- Definition of Forestry by UNFCCC, Convention of Bio Diversity, FAO
- Definition of Deforestation by UNFCCC, Convention of Bio Diversity, FAO

II. Introduction to Forestry

- Forest resources of Pakistan and their distribution of forests in different ecological zones with species composition.
- Economic, social and environmental importance of forests.
- Main issues in protections and development of forest resources in Pakistan.
- Measures taken for protection and development of forest resources (legal, technical, social and financial).

III. Forest Policies and Laws

- **Forest Laws/Regulations/Acts/Ordinances:**
 - The Forest Act 1927
 - Pakistan National Forest Policy 2015
 - Constitutional Provisions relating to Forest under Constitution of Pakistan 1973.
- **Provincial Acts/Ordinances:**
 - Khyber Pakhtunkhwa Forest Ordinance 2002
 - Punjab The Forest Act, 1927 amended 2016.
 - Baluchistan Forest Regulation. 1890
 - Sindh Forest Act 2012
 - Gilgit Forest Rules 1932
 - AJK Forest Regulations
- **Multi-lateral Environment Agreements:**
 - United Nations Framework Convention on Climate Change
 - United Nations Forum on Forest Strategic Plan
 - Convention on Biological Diversity 1993

IV. Forest Management

- Definition and scope of forest management in Pakistan.
- Objectives of forest management.
- Forest fires and their control
- Protected area Management
- Silviculture efforts at National/Provincial level on forest & Wildlife

V. Forestry and Wildlife Statistics of Pakistan

SUGGESTED READINGS

S. No.	Title	Author
1.	Forest Types of Pakistan, Pakistan Forest Institute, Peshawar.1965	Champion, H.G., Seth, S.K. and Khattak, G.M.
2.	Forest Law and Sustainable Development: Addressing Contemporary Challenges Through Legal Reform	Lawrence C. Christy. 2007.
3.	Explanatory Notes on Forest Law with up-to-date amendments by Asif Jah. 2009.	Compiled for the use of Forestry students at Pakistan Forest Institute Peshawar.
4.	West Pakistan Forest Manual Vol.I	Govt. of Pakistan. 1975.
5.	Forest Policy Directives	Ministry of Food and Agri. Government of Pakistan.
6.	Forest Act, 1927	Ideal Publisher, Karachi
7.	NWFP (KP) Forest Ordinance 2002.	
8.	Global Environmental Forest Policies: An International Comparison	McDermott, C., B. Cashore and P. Kanowski. 2009.
9.	Forest Management and Planning	Pete Bettinger, Kevin Boston, Jacek P. Siry and Donald L. Grebner (2008)
10.	Forest Management and the Water Cycle: An Ecosystem-Based Approach	Michael Bredemeie (2010)
11.	Legal and Institutional Dynamics of Forest Management in Pakistan	Yusuf, M. (2009)
12.	Global Forest Resources Association 2010	FAO Forestry Paper 163 Food and Agriculture Organization
13.	National Forest Policy of Pakistan 2015	
14.	www.cbt.intl (Convention on Biological Diversity)	

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

Case No.	F.4-119/2022-R
Particulars of post	Senior Psychologist (BS-19), Federal Public Service Commission.
Minimum Qualification & Experience:	<p>(A)</p> <p>i. Ph. D. or equivalent qualification in Psychology from a University recognized by HEC.</p> <p>ii. Eight (8) years post qualification experience in any of the fields specified in Schedule-II.</p> <p style="text-align: center;">OR</p> <p>i. M. Phil or equivalent degree in Psychology from a University recognized by HEC.</p> <p>ii. Ten (10) years post qualification experience in any of the fields specified in Schedule-II.</p> <p style="text-align: center;">OR</p> <p>i. Second Class or Grade 'C' Master's degree in Psychology or Applied Psychology or equivalent qualification from a University recognized by HEC.</p> <p>ii. Twelve (12) years post qualification experience in any of the fields specified in Schedule-II.</p> <p>(B)</p> <p>Two (2) Research Publications in reputed journals in the field of Psychology.</p> <p><u>FIELDS SPECIFIED IN SCHEDULE-II.</u></p> <p>(a) <u>Research:</u> Research experience of carrying out empirical research in one of the fields/ areas i.e. Psychometrics, or Clinical, or Test Construction and Measurement or Personnel Selection or Job analysis or Counselling.</p> <p>(b) <u>Professional:</u> Experience in Armed Forces or Public Service Commissions or other institutions engaged in work related to selection of personnel or recruitment or Test Construction and Measurement or report writing.</p> <p>(c) <u>Teaching:</u> Teaching experience in one of the fields/ areas i.e. Psychometrics or Clinical or Test Construction and Measurement or Organizational/ Personnel Psychology or Counselling Psychology. Teaching experience should be at post graduate level.</p>

Part-I: 25 Marks (MCQ)

- 25 MCQ Questions on Part-II.

Part-II: 75 Marks (Psychology) (Descriptive)

- I. **Nature and Scope of Psychology:** Definition and scope, Psychology as a Science, Schools, Perspectives, and Models of Psychology, Recent Trends
- II. **Biological Basis of Behaviour:** Nervous System, Neuron and its function, Central and Peripheral Nervous System, Endocrine System
- III. **Sensation and Perception:** Sensory process through sense organs, Perception, Gestalt Principles, Binocular and Monocular cues, Illusions and Extra Sensory Perception, Determinants of Perception
- IV. **Learning and Memory:** Nature and Forms of Learning, Types of learning: Classical and Operant Conditioning, Reinforcement, Extinction, Discrimination, Punishment, Observational Learning, Theories of Learning, Types of Memory, Process of Memory, Forgetting, Theories of Memory

- V. Motivation and Emotion:** Homeostasis, Factors affecting Motivation, Biogenic and Social Motives, Measurement of Human Motivation, Theories of Motivation, Emotions, Types of Emotions, Physiological changes and Emotion, Theories of Emotion.
- VI. Psychological Assessment:** Attributes of Psychological Measures, Validity, Reliability, Item Analysis, Norms, Modern Test Theory, Selection and Training, Educational and Clinical Assessment, Ethical Standards and Legal Issues, Scale Development
- VII. Personality:** Determinants of Personality, Factors in Development of Personality, Theoretical Perspectives, Traits and Types, Personality Assessment and Techniques, Cross-Cultural Issues.
- VIII. Intelligence:** Theories of Intelligence, Types of intelligence (IQ, EQ), Assessing Intelligence
- IX. Social Influence and Group Dynamics:** Social Facilitation, Attribution, Conformity, Obedience, Altruism, Attitudes, Social Norms, Measurement of attitude
- X. Developmental Psychology:** Physical, Cognitive, Social and Emotional development in Childhood, Adolescence, Adulthood and Old Age
- XI. Abnormal and Clinical Psychology:** Concept and causes of Abnormality, Clinical Assessment and Intervention, Different disorders such as Schizophrenia, Mood disorders, Anxiety disorders, Personality disorders, etc. Psychological treatment including different Therapeutic techniques.
- XII. Organizational/Industrial Psychology:** Leadership styles, Decision making, Work motivation, Organizational Culture, Stress and Conflict at Work and its Management, Organizational Socialization, Job related Attitude, Sexual Harassment, Glass Ceiling, Human Computer interaction.

SUGGESTED READINGS

S.No.	Title	Author
1.	Applied Industrial/Organizational Psychology	Aamodt, M.
2.	Introduction to Psychology	Atkinson R. C., & Smith, E. E
3.	Social Psychology	Baron, R. A
4.	Development Across the Life Span	Feldman, R.
5.	Abnormal Psychology	Kring, A. M
6.	Psychology	Myers, D. G.
7.	Psychological Testing	Kaplan & Sacuzzuo,
8.	An introduction of theories of personality	Ewen, R. B.
9.	Organizational Psychology	Singh, P.

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

Case No.	F.4-120/2022-R
Particulars of post	ENT Specialist (BS-18) , National Institute of Rehabilitation Medicine, Ministry of National Health Services, Regulations & Coordination.
Minimum Qualification & Experience:	i). MBBS or equivalent qualification recognized by PM & DC. ii). PM&DC Level-III qualification in the related speciality with 02 years post qualification experience in the relevant field. OR PM&DC Level II (a) or Level II (b) in the related speciality with 04 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-II qualification in **ENT**.