

FEDERAL PUBLIC SERVICE COMMISSION
(Curriculum & Research Wing)

Scheme and Syllabi for Screening/Professional Tests as well as Descriptive Examination
Relating to Posts Advertised Vide Consolidated Advertisement No. 05/2015

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Main Topics for MCQ Test
1.	55/2015	Chemist (BS-17), Geological Survey of Pakistan, Ministry of Petroleum and Natural Resources.	Second Class or Grade 'C' M.Sc. degree in Chemistry with specialization in analytical/ inorganic/ physical or geochemistry from a University recognized by the HEC.	Objective Type Test (MCQ) <u>Part-I</u> English = 20 marks <u>Part-II</u> Professional Test = 80 marks	<u>Part-I</u> Vocabulary, Sentence Structuring, Grammar Usage <u>Part-II</u> <ul style="list-style-type: none"> • Basic concept of Analytical Chemistry. • Chemical Analysis of Water • Theory, Technique and Calculation of Volumetric and Gravimetric Analysis. • Coal Analysis particularly Analysis of Proximate and Ultimate • Theory, Principles, Uses and Working of Atomic Absorption Spectrophotometer and Flame Photometer • Oxidation-Reduction Titration • Decomposition Techniques of Rock and Minerals • Method of Maintaining Accuracy/Precision in Chemical Analysis

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Main Topics for MCQ Test
2.	59/2015	Assistant Director/ Senior Instructor/ Commandant (BS-17), Civil Defence Training School, Ministry of Interior.	<p>(a) Graduate.</p> <p>(b) <u>TECHNICAL</u>:</p> <p>i. Civil Defence General Instructors Course (CDGI).</p> <p>ii. Civil Defence Technical Instructors Course (CDTI). OR Specialist Instructors Course in Rescue Service, Warden Service and Casualty Service/ First Aid/ Lay Lecturer Certificate.</p> <p>iii. Station Fire Officers Course.</p> <p>iv. Bomb Disposal Course. OR Camouflage Course.</p> <p>v. Officers Course Operational Control (OCOC). OR Incident Officers Course.</p> <p>vi. Civil Defence Officers Course Organization and Administration (OCOA). OR Officers Course General or Officers Course Planning & Organization.</p> <p>(c) Three (3) years post qualification experience in Civil Defence/ Fire Services OR Second Class or Grade 'C' M.Sc./ MA with three (3) years post qualification practical/ Instructional experience in Civil Defence. OR Bachelor Degree with five (5) years post qualification practical/ Instructional experience of Civil Defence.</p>	<p>Objective Type Test (MCQ)</p> <p>Part-I English = 20 marks</p> <p>Part-II Professional Test=80 marks</p>	<p>Part-I Vocabulary, Grammar Usage, Sentence Structuring</p> <p>Part-II Professional Test comprising core contents of following courses:</p> <ul style="list-style-type: none"> • Civil Defence General Instructors Course (CDGI). • Civil Defence Technical Instructors Course (CDTI) • Civil Defence Officers Course (General) • Civil Defence Officers Course (Organization and Administration). • Station Fire Officers Course. • Bomb Disposal Course. • Camouflage Course.

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3.	60/2015	Assistant Director (Geology) (BS-17), Geological Survey of Pakistan, Ministry of Petroleum and Natural Resources.	Second Class or Grade 'C' M.Sc. degree in Geology or equivalent qualification from a University recognized by the (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"> • Geomorphology • Stratigraphy • Structural Geology • Plate Tectonics • Physical Geology • Petrology and Mineralogy • Geochemistry • Geological Mapping • Paleontology (Invertebrate & Vertebrate) • Engineering Geology
4.	61/2015	Mining Geologist (BS-17), Geological Survey of Pakistan, Ministry of Petroleum and Natural Resources.	Second Class or Grade 'C' M.Sc. degree in Geology with specialization in Mining Geology/ Economic Geology or equivalent from a University recognized by the HEC.	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"> • Topographical Surveying • Ore Dressing & Beneficiation • Mineral Exploration/Mineral Economics • Photogrammetry/Photogeology • Coal Geology • Mining Geology and Mineral Economics. • Metalogeny and Plate Tectonics • Mine Surveying /Field Survey • Rock Mechanics • Mine Ventilation • Mineralogy and Petrology • Mine Management • Mining Law

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5.	62/2015	Chemist (BS-17), Department of Plant Protection, Ministry of National Food Security & Research.	Second Class or Grade 'C' M.Sc. Chemistry OR Second Class or Grade 'C' M.Sc. (Agriculture) with Agricultural Chemistry as a major subject.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II Professional Test = 80 marks	Part-I Vocabulary, Sentence Structuring, Grammar Usage Part-II <ul style="list-style-type: none"> • Basic concept of Analytical Chemistry. • Sampling, Standardization and calibration • Method of Maintaining Accuracy/Precision in Chemical Analysis • Using Spread Sheet in Analytical Chemistry • Introduction of Spectro Chemical Methods • Usage of Instruments for Optical Spectro Photometry • Molecular Absorption Spectro Photometry • Molecular Fluorescence Spectro Photometry • High performance liquid Chromatography • Gas Chromatography
6.	63/2015	Assistant Armament Supply Officer (BS-16), Naval Headquarters, Ministry of Defence.	i) Second Class or Grade 'C' Bachelor's degree in Science with Physics/ Chemistry. ii) Three (3) years post qualification experience in Ammunition matters OR Master's Degree in Physics/ Chemistry.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II General Science Test = 80 marks	Part-I Vocabulary, Grammar Usage Part-II Physics: <ul style="list-style-type: none"> • Heat & Thermodynamics, • Electrostatics, • Electromagnetism, • Electricity, • Waves, • Motion & Force, • Work, Energy, • Sound, • Gravitational Force, Chemistry: <ul style="list-style-type: none"> • Metallurgy, • Thermodynamics, • Stoichiometry, • Nature, Properties and States of Matter, • Gases, Liquids & Solids, • Organic Chemistry

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Main Topics for MCQ Test
7.	64/2015	Assistant Director (BS-17), Hajj Computer Cell of Hajj Wing, Ministry of Religious Affairs and Interfaith Harmony.	Second Class or Grade 'C' Master's Degree in Computer Science/Information Technology or equivalent qualification from a University recognized by the HEC.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II Professional Test = 80 marks	Part-I Vocabulary, Sentence Structuring, Grammar Usage Part-II <ul style="list-style-type: none"> • Object Oriented Programming • Data Structure • Database Management System • Operating Systems • Network, Network Architecture and Topologies • Software Engineering • Internet and Web Applications
8.	65/2015	Data Control Officer (BS-16), Ministry of Religious Affairs.	i. Second Class or Grade 'C' Bachelor's Degree in Computer Science/ Information Technology or equivalent qualification from a University recognized by the HEC. ii. Two (2) years post qualification experience in Computer Operation.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II Professional Test = 80 marks	Part-I Sentence Structuring, Grammar Usage Part-II <ul style="list-style-type: none"> • Microsoft Windows • Storage and Multimedia • Subject Oriented Data Processing (Basic Terms & Trends) • Networking (Terms, Concepts, Principles, Protocols) • Programming (Programming Concepts, Loops, Conditions, Functions) • Data Bases (Concepts, SQL Queries, Tables, Keys, Normalization) • Software/Hardware (MS-Office, Peripheral Devices, Shortcut Keys, Concepts)
9.	71/2015	Assistant Director (BS-17), Ministry of Religious Affairs and Interfaith Harmony.	Second Class or Grade 'C' Master's Degree in Islamic History/ Islamic Studies/ Arabic/ Urdu/ Persian/ Economics with Islamic subject/ Political Science/ Islamic Jurisprudence/ LLB (Shariah) or equivalent qualification from a University recognized by the HEC.	Objective Type Test (MCQ) Part-I English = 20 marks Part-II Professional Test = 80 marks	Part-I Vocabulary, Sentence Structuring, Grammar Usage Part-II <ul style="list-style-type: none"> • The sources of Islamic Law • Islamic Criminal Law • Islamic Family Law • Islamic Law and Human Rights • The Arbitration Law in Pakistan • Research Techniques and Methodology • Data Analysis and Report Writing • Principles of Islamic Jurisprudence • Islamic Banking and Insurance • Muslim Family Ordinance 1961

S. No	Case No. F.4-	Particulars of Post(s)	Qualifications for Posts	Test Specification	Main Topics for MCQ Test
10.	72/2015	Junior Establishment and Finance Officer (BS-16), OS Directorate, GHQ, Ministry of Defence.	<p>i. Second Class or Grade 'C' Bachelor's Degree in Commerce or equivalent from a University recognized by the HEC.</p> <p>ii. Two (2) years post qualification experience in Administration and Finance.</p>	<p>Objective Type Test (MCQ)</p> <p>Part-I English = 20 marks</p> <p>Part-II Professional Test = 80 marks</p>	<p>Part-I Sentence Structuring, Grammar Usage</p> <p>Part-II</p> <ul style="list-style-type: none"> • Civil Servants Act 1973 and Rules made thereunder • Civil Servants (Appointment, Promotion and Transfer) Rules, 1973 • Government Servants Conduct Rules, 1964 • Civil Servant (Appeal) Rules, 1977 • FPSC Ordinance, 1977 and Rules made thereunder • Revised Leave Rules, 1980 • Public Procurement Rules, 2004 • Human Resource Management and Staff Development • System of Financial Control & Budgeting 2006 • Basic Knowledge of Computer/IT.
11.	73/2015	Junior Scientific Officer (JSO) (BS-16), Ordnance Corps, Ministry of Defence.	Second Class B. Tech. (Textile/Mechanical) or equivalent qualification from a University recognized by the HEC.	<p>Objective Type Test (MCQ)</p> <p>Part-I English = 20 marks</p> <p>Part-II Subject Test = 80 marks</p> <p>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.</p>	<p>Part-I Sentence Structuring, Grammar Usage</p> <p>Part-II (For B. Tech. Textile candidates)</p> <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. <p>Part-II (For B. Tech. Mechanical candidates)</p> <ul style="list-style-type: none"> • Heat Transfer • Thermodynamics • Industrial Materials • Machine Design and Drawing • Mechanics of Machines • Workshop Technology • Hydraulic Machines

Syllabi for Written Examination (Descriptive) for all posts in BS-18 & BS-19

PAPER-I: ENGLISH (100 MARKS)

- (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 sentence 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 (100 MARKS)**for Deputy Chief (Building) (BS-19),**

National Energy Conservation Centre (ENERCON), Ministry of Water and Power.
(Case No. 56/2015)

I. Civil Engineering Fundamentals:

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

II. Costing, Accounting and Budgeting:

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

III. Project Management:

Time lines, milestones, resources allocation, dependency, Gant Charts, Preparation of PC-I, PC-II, PC-III & PC-IV, Financial Management of Projects

IV. Inventory Management:

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

V. Quality Management Systems:

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

SUGGESTED READINGS

S.No.	Title	Author
1.	Plain and reinforced concrete	Nilson.
2.	Strength of material	Andrew Pytel and Singer.
3.	Civil Engineer's Reference Book	LS Blake
4.	Surveying and Leveling	T.P Kanetaker.
5.	Public Health Engineering	STEEL.
6.	Fluid mechanics with engineering applications	Finnemore/ Franzini.
7.	Handbook of Engineering Management	Dennis Lock.
8.	Total Quality Management	Dale H. Besterfield, Carol Besterfield-Michna, Glen H. Besterfield, Mary Gesterfield-Sacre

PAPER-II: PROFESSIONAL (100 MARKS)

for Deputy Chief (Transport) (BS-19),

National Energy Conservation Centre (ENERCON), Ministry of Water and Power.
(Case No. 57/2015)

I. Transportation Engineering:

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

II. Mechanical Engineering Fundamentals

Mechanics and Strength of Materials: Concept of Stress and Strain, bending, torsion, geometric properties of areas, principal stresses, Tensile testing, Stress- Strain curve, Difference between Engineering and True Stress & Strain, Shear Stress & Strain, Concept of elastic and plastic deformation, Yield & ultimate Tensile strengths, Elongation, Toughness and Resilience, Ductility and Malleability, Hardness Testing, Brinell and Rock well Hardness test, bending moment,

Fluid Mechanics: Properties and basics of fluid mechanics, loss of head, power transformation by fluids, pumps, turbines. Fluid static's, Fluid dynamics, Types of flow: Turbulent and Laminar, Reynold's number.

Manufacturing: Different manufacturing processes like Casting, Forging, Machining, Rolling, Extrusion, Wire-drawing, welding, Turning (lathe), Milling, Shaping, Gear cutting, Drilling, Fitting.

III. Environmental Engineering:

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

IV. Costing, Accounting and Budgeting:

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

V. Project Management:

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

VI. Inventory Management:

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

VII. Quality Management Systems:

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

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S.No.	Title	Author
1.	Transportation Engineering, Planning and design	Paul Wright.
2.	Public Health Engineering	STEEL.
3.	Engineering Mechanics (Statics)	J.L. Merriems.
4.	Manufacturing Processes for Engineering Materials	Kalpakgjian
5.	Environmental Science: Earth as a living Planet, 9 th ed.	Botkin, D . Keller, E. 2014
6.	Handbook of Engineering Management	Dennis Lock.
7.	Total Quality Management	Dale H. Besterfield, Carol Besterfield-Michna, Glen H. Besterfield, Mary Gesterfield-Sacre

PAPER-II: PROFESSIONAL (100 MARKS)
for Draftsman (BS-19),
 Law & Prosecution Department, Gilgit Baltistan,
 Ministry of Kashmir Affairs and Gilgit Baltistan.
 (Case No. 66/2015)

I. Definitions of Crime

II. All Provisions of:

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

SUGGESTED READINGS

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

PAPER-II: PROFESSIONAL (100 MARKS)
for Assistant Professor Commerce, Male (BS-18),
Islamabad Model Colleges, Capital Administration & Development Division
 (Case No. 68/2015)

Part-I: (Commerce)

50 Marks

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

Part-II: (Professional)

50 Marks

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

II. Process of Teaching and Teaching Strategies

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

III. Educational Assessment and Evaluation

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

IV. Educational Administration and Supervision

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

V. Research Methods in Education

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

SUGGESTED READINGS

S. No.	Title	Author
1.	Fundamentals of Accounting Principles	Wild. Larson. Chiappetta
2.	Principles of Accounting, and Advanced Accounting	Sohail Afzal
3.	Cost Accounting	Nisar ur Din.
4.	Advanced Auditing	Prof. Dr. Khuaja Amjad Saeed
5.	Managerial Economics	Micheal Baye
6.	Research in Education	JW Best
7.	Integrating Education Technology into Teaching	Roblyer
8.	Curriculum Development	S. M. Shahid
9.	Educational Measurement and Evaluation	S. M. Shahid
10.	Educational Administration	S. M. Shahid

PAPER-II: PROFESSIONAL (100 MARKS)
for 2nd Engineer (Electronics) (System Engineer PCBRF) (BS-18),
Pakistan Navy, Ministry of Defence
 (Case No. 70/2015)

Engineering: 100 Marks

I. Electricity & Electronics:

Electricity & Magnetism; Electrical potential, Resistance, Laws of resistance, Conductance, Conductivity, Impedance, Ohm law, Resistance in series and in parallel, practical resistors, work, power, Energy, Joule's law of electric field intensity, Gauss's Theorem, Capacitor, Capacitance, Capacitors in parallel and series. Force on a conductor in a magnetic field, electrical and magnetic circuits, leakage flux, Relation between magnetism and electricity, Induced emf, induced current and directions, Faraday's laws of electromagnetic inductions, Lenz's law, dynamically induced emf, Self inductance, mutual inductance and inductance in series/parallel, magnetic hysteresis, Energy stored in magnetic field, Generation of alternating currents and voltages.

II. Electronics:

Transistors: types, calculations of voltages and currents in simple transistor circuits.

Amplifier & Oscillators: Working and classification of amplifiers, Class A and Class B Amplifiers, Feedback Amplifiers, Types of Feedback, RC Oscillators.

Integrated Circuits: OP Amps, timers, flip flop, converters, filters.

Telecommunications: EM theory, antennas, antenna gain, free space loss, fading. Modulations (AM, FM, PM, PWM, Delta, FSK, ASK, PSK), Error correction, Demodulation, Detectors, Transmitter, Receivers.

DSP and Controls; filters, stability, Z-transform, Nyquist criteria, S domain, transfer functions.

Introduction to Computing: History and evolution of computers, central processing unit, data storage, input/output devices, multimedia, operating systems, programming languages, networking, the internet, system analyses and design, management information system, electronic commerce, security and privacy issues, ethical issues and the computing profession,

III. Power Systems:

Power network analysis, Polyphase circuits, Transients, Transmission Lines, Losses.

IV. Costing, Accounting and Budgeting:

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

V. Project Management:

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

VI. Inventory Management:

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

VII. Quality Management Systems:

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

SUGGESTED READINGS

S.No.	Title	Author
1.	Electronic Devices and Circuits.	Bogart
2.	Semiconductors	Manzar Saeed
3.	Modern Digital and Analog Communication	B.P.Lathi
4.	Computers, tools for an Information age,	H.L. Captron, Addison Wesley
5.	Handbook of Engineering Management	Dennis Lock.
6.	Total Quality Management	Dale H. Besterfield, Carol Besterfield-Michna, Glen H. Besterfield, Mary Gesterfield-Sacre