

# PAKISTAN ENGINEERING COUNCIL

## Syllabus for Engineering Practice Examination (EPE) Part-I (Common to all Engineering Disciplines)

Total Marks: 40

### **PART-I (COMMON TO ALL DISCIPLINES)**

This is common to all disciplines comprising of 40 Multiple Choice Questions (MCQs) of one mark each (total marks 40) with the duration of 2 hours. Qualifying Marks for this part shall be **sixty per cent**.

#### **i. MANAGEMENT (ENGINEERING RELATED)**

**20%**

##### a. Quality issues

- Definition of quality
- Quality planning (steps for planning of quality)
- Quality control (activities for control quality)
- Quality in service (how to achieve quality in services)
- Quality reliability (why reliability is essential in quality)
- Quality assurance (role of quality assurance in project)

##### b. Finance

- Financial Management (definition)
- Functions of financial management (executive/routine functions)
- Objectives of financial management (macro/micro level)
- Cost analysis (cost benefit)
- Financial discipline (how to maintain financial discipline)
- Budgeting (why budgeting is important)

##### c. Procurement/ Legal

- Project Proposal (steps for planning of project)
- Procurement (action for procurement)
- Bidding (actions/steps for bidding)
- Contracts (award of contracts)

- Arbitrations (appointment of arbitrator & decision implementation)
- Escalation (why escalation is paid & how it can be controlled)

d. Latest trends

- Maintenances management (objective)
- Maintenance planning (types)
- Maintenance control (efficiency with maintenance control)
- Maintenance strategy (to develop maintenance strategy)
- Maintenance standards (to minimize maintenance cost)

**ii. COMMUNICATION SKILLS**

**20%**

a. Understanding the Basic English

- Direct and Indirect Speech
- Active & Passive Voice & Conditional Sentences and Composition + Summarization (Descriptive, argumentative in composition and Comprehension)
- Précis writing

b. Principles of Effective Communication

- Concepts
- Benefits and Characteristics of Effective Organizational Communication
- Basic forms of Communication
- Common mistakes in communication
- Understanding and applying the seven C's of effective communication
- Presentation skills

c. Communication Methods and Skills, Business Messages

- Communication and the Technology context
- Formal letters
- Memorandum
- Curriculum
- Vitae (Résumé)

➤ Business E-Mails and Fax Messages

**Suggested Books**

- Understand & Communicate {book 2 and published by FEP International (Pvt.) Ltd}.
- Concepts (book 3 and 4) by P.C. Wren.
- Communication for Business by Shirley Taylor (4<sup>th</sup> Edition)
- Business Communication today by Courtland L. Bovee
- Technical Communication (tenth ed.), Mike Markel. Bedford/St. Martin's: 2010.

**iii. ETHICAL AND SOCIAL ISSUES**

**20%**

- a. Code of ethics
- b. Professional obligation of engineers
- c. Role of opportunity and conflicts
- d. Interpersonal relations

**Suggested Books**

- Book: Engineering Ethics by Charles B. Fleddermann, 4th edition, Pearson Prentice Hall, 2005, ISBN-13: 978-0132145213
- Book: Ethics in Engineering by Mike W. Martin and Ronald Schinzinger, 4th edition, McGraw-Hill Education, 2005, ISBN: 9780072831153
- Book: Conflict of Interests in the Professions. Edited by: Michael Davis and Andrew Stark. 2001. Oxford University Press.
- Boylan Michael, Series Editor, Basic Ethics in Action Series, Prentice Hall, 2001.
- Ferrell, O.C, and Fraedrich, John, Ethical Decision Making and Cases, New York, Houghton Mifflin, 2002 (5th Edition).
- Marcus Alfred A., Business and Society, Irwin, (2nd Edition), 1998
- Post James E. and Lawrence Ann T., Business and Society, (10th Edition), 2006.
- Daryl Kohn. The Ground of Professional Ethics. 1994. Routledge: London and New York. ISBN 0-203-00661-5

#### iv. ENVIRONMENTAL ISSUES AND POLICIES

20%

##### a. Basic Concepts in Environment

- Environmental engineering and science
- History and development of environmental engineering
- Contaminants and pollutants and Role of professional engineer
- Sustainability
- Environmental Quality Standards (EQS) as defined in EPA Act

##### b. Environment and Safety

- Environmental organization, legislation, standards, monitoring and compliance assurance
- National and International Laws and Codes (Pakistan Environment Protection Act 1997, NEQS, ISO 14000)

##### c. Environmental Impact Assessment (EIA)

- Definition of EIA, IEE, EIS
- Environmental Issues and Priorities
- Environmental Laws and Regulations in Pakistan, Pak-EPA and other Provincial Standards and Guidelines for the Preparation and Reviews of Environmental Reports

##### d. Environmental Organization and legal framework

- Legislation, Standards, Monitoring and Compliance Assurance
- Environmental Decision-Making for Industries
- Evolution of EU and Pakistan environmental legislation systems

#### **Suggested Books**

- Gerard Kielly, "Environmental Engineering", McGraw-Hill, 1998
- Davis, Mackenzie L. and Susan J. Masten, "Principles of Environmental Engineering and Science", MacGraw Hill, 2004, International NY

- Davis, M.L. and Cornwell, D.A., "Introduction to Environmental Engineering", 3<sup>rd</sup> Ed., 1998, McGraw-Hill, ISBN: 0-07-015918-1.
- B.N. Behera, A.k. Rath, "Basic Environment Education" Dominant Publishers and Distributors Pvt Ltd, New Delhi, 2013
- Pakistan Environment Protection Act No. XXXIV Of 1997

**v. HAZARDS AND RISK MANAGEMENT**

**20%**

- a. Occupational Health Hazards/Risks
- b. Principles and Methods of Hazard Identification
- c. Evaluation, Risk Assessment and its Human Behavioral Aspects of Risk Management (Fire Safety)
- d. Mitigation measures

**Suggested Books**

- Geoff Wells " Hazard Identification and Risk Assessment" Institution of Chemical Engineers,
- Phil Hughes, Ed Ferrett, " Introduction to health and safety at Work: The Hand book for the NEBOSH General Certificate", Butterworth-Heinemann publications
- Nicholas J.Bahr, "System Safety Engineering and Risk Assessment: A Practical Approach"Taylor & Francis,
- CCPS-Center for Chemical Process Safety," Guide lines for Hazard Evaluation Procedures, Center for Chemical Process Safety" American Institute of Chemical Engineers",New york
- CCPS-Center for Chemical Process Safety," Guide lines for preventing Human error in process safety, Center for Chemical Process Safety" American Institute of Chemical Engineers",New york
- CCPS-Center for Chemical Process Safety," Guide lines for chemical process quantitative risk analysis, Center for Chemical Process Safety" American Institute of Chemical Engineers", New York

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