

## VIII SEMESTER

### GENERAL SAFETY

**Sub Code : 10MN81**  
**Hrs/ Week : 04**  
**Total Hrs. : 52**

**IA Marks : 25**  
**Exam Hours : 03**  
**Exam Marks : 100**

#### Part-A

**Introduction:** Safety conference and their impact, Safety Education and training Pit Safety committee, Management Safety Audit system. **06 Hrs**

Internal Safety Organization, Safety Policy, health and safety program, Feed back of safety method. **06 Hrs**

**Occupational Health:** Safety and occupational health survey, notified and general miners diseases and their preventive measures. Permissible standard of dustiness. **07 Hrs**

**Vocational Training:** V.T. Rules in detail, Indian Electricity Rules applicable to mines, rescue rules in detail. **07 Hrs**

#### Part-B

**Safety Rules and Regulations:** Standing order in event fire, inundation and failure of main mechanical ventilator. **06 Hrs**

**Bye-Laws:** ANFO Explosive, A.C. mains firing, Bulk transportation of explosives, Diesel Locomotives. **06 Hrs**

**Accidents:** Classification of accidents, statistics, causes and preventive measures. Accident enquiry report for various accidents due to roof fall, blasting, machinery failure etc., **07 Hrs**

**Accidental Planning:** Collection and presentation of accidental records, zero accidental planning (ZAP) and minimum accidental planning (MAP). Inspection for safety. **07 Hrs**

#### TEXT BOOKS:

Legislation in Indian Mines a Critical Appraisal, Vol. I & II, Rakesh & Prasad, Tara Book Agency, Varanasi, 1999.  
Mine Management Legislation and General Safety, Ghatak, Coal Field Publishers, Asansol, 1998.

#### REFERENCE BOOKS:

DGMS Classified Circulars, Lovely Prakashan, 1998. V.T. Rules 1966, Bare Act Publishers, 1999. Indian Electrical rules 1956, Bare Act Publishers, 1999. Mine Rescue Rules 1985, Bare Act Publishers, 1999.

**Scheme of Exam:** Total **EIGHT** questions are to be asked, **FOUR** from each part. The student has to answer any **FIVE** full questions selecting at least **TWO** from each part.

## MINE MANAGEMENT

Sub Code : 10MN 82  
Hrs/ Week : 04  
Total Hrs. : 52

IA Marks : 25  
Exam Hours : 03  
Exam Marks : 100

### PART-A

**Brief History of Management:** Evolution of Management, traditional management, Scientific management, Contribution of pioneers to scientific management, Functions of management, Principles of Management. Mine management: Duties and responsibilities of mines manager. 06 Hrs

**Organization and Industrial Ownership:** Characteristics of Organization, Principles of organization, types of organization, management of conflict, management by exception, management by objective (MBO). Mine organization: Opencast and under ground mines. Industrial ownership: Definition, types of ownership, single ownership, partnership, Joint Stock Companies, co-operatives organization and State and central government owned. Mine ownership: duties and responsibilities of mine owner. 08 Hrs

**Personal Management:** Functions of personnel management, recruitment and selection of employees. Education and training: mines vocational training center. Communication: formal and informal communication, barriers in communication and techniques to overcome barriers and improve communication. 06 Hrs

**Industrial Psychology and Human Relation:** Definition, scope of industrial psychology, aims of industrial psychology. Group Dynamics. Motivation: definition, characteristics of motivation, kinds of motivation, factors affecting motivation, motivational techniques, theories of motivation. Maslow's hierarchy of needs, Theory X and Y, Hawthorne experiment 06 Hrs

### PART-B

**Industrial Relations and Legislation:** Introduction, basic requirement of industrial –relation programme. Trade unions: definition, functions of trade unions. Industrial disputes: causes, settlement of industrial disputes, handling of workers' grievances. Workers participation in management, work of ILO. Necessity of labour legislation, principles of labour legislation. Important provisions of factories act, payment of wages act, Workmen's Compensation act, Employee state insurance Act. 08 Hrs

**Work Study:** Definition, productivity and work study, position of work study department in the organization, work study man, work study and the workers, work study and the management. Motion Study: Definition, aims of motion study, procedure for motion study, micro motion study, motion economy. 06 Hrs

**Time Study:** Definition, uses of time study, procedure, performance rating number of cycles to be timed, allowances, uses of time study data for wage incentives. Standard Data: Advantages, Methods for determining Standard Data, Work factor system, Method Time Measurement (MTM), Basic Motion Time Study. 06 Hrs

**Management Information System (MIS):** Introduction, Need for Information System, Characteristics of Good MIS, Sources of Information, application of MIS, design of MIS, development, Implementation of MIS. 06 Hrs

### **TEXT BOOKS:**

Mine Management, Legislation and General Safety, S. Ghatak, Coal Field Publishers, Asansol, 1999.

Management by Harold Koontz and Heinz Wehrich, Mc Graw Hill Company, 1990.

### **REFERENCE BOOKS:**

Industrial Organization and Engineering Economics, Banga and Sharma, Khanna Publication, New Delhi, 1999.

Legislation in Indian Mines: A Critical Appraisal, Published by Vivek, P-8, New Medical Enclave, B.H.U., Varanasi, 1992. Modern Production Management, Buffa, John Wiley and Sons, 1998. Industrial Management, O.P.Khanna, Dhanpat Rai and Sons, 1999. Mine Management, V.N. Singh, Lovely Prakashan, 2003.

**Scheme of Exam:** Total **EIGHT** questions are to be asked, **FOUR** from each part. The student has to answer any **FIVE** full questions selecting at least **TWO** from each part.

## TOTAL QUALITY MANAGEMENT

Sub Code : 10MN 833  
Hrs/ Week : 04  
Total Hrs. : 52

IA Marks : 25  
Exam Hours : 03  
Exam Marks : 100

### Part-A

- 1. Overview of Total Quality Management:** Introduction – Definition, Basic Approach, Contribution of Gurus – Total Quality Management, TQM framework, Historical Review, Benefits of TQM, TQM organization. 05 Hrs
- 2. Leadership:** Characteristics of quality leaders, Deming's philosophy, Role of TQM leaderships – Customers' satisfaction, Customers' perception, Handling customers' complaints, Feedback, Employee involvement, role of Motivation, Suggestion system, Performance appraisal Continuation Process Improvement – Juran's Trilogy, PDSA cycle, Problem Solving methods, Imai's Kaizen, Reengineering, 6 sigma. 08 Hrs
- 3. Tool & techniques of TQM:** Bench marking, Definition, Process of bench marking, quality Management Systems, ISO – 9000 series of standards, Implementation and documentation of ISO – 9000, Introduction to QFD and QFD process, Quality by design, rationale for implementation of quality by design, TQM exemplary organization, FMEA (Failure Mode and Effect Analysis), Design FMEA and Process FMEA studies. 07 Hrs
- 4. Statistical Process Control:** 7 Basic tools of quality control, Control charts for variables, Construction, interpretation, Analysis using X-R control charts, process capability estimation, process capability indices, process improvement through problem analysis (Intensive coverage with numerical problems) 06 Hrs

### Part-B

- 5. Control Charts for Attributes:** Construction interpretation and analysis of P- Charts, NP- Chart, C- chart, U-Chart, Process improvement through problem analysis (Intensive coverage with numerical problems). 08 Hrs
- 6. Product Acceptance Control:** Design of Single sampling, Double sampling and Multiple sampling plans, Analysis of the characteristics of the above sampling plans, Selection of sampling plans for Product Acceptance Control through IS 2500 Part 1 and Part 2. 06 Hrs
- 7. Reliability and Life Testing:** (Basic treatment only): reliability analysis of components, standard configuration systems like series, parallel redundancy and principles of design for reliability, Procedure for life testing. 06 Hrs
- 8. Experimental Design:** One factor designs, two factor designs, Orthogonal Design, Full factorial and fractional factorial design, Taguchi's philosophy of quality engineering, Loss function, Orthogonal array, signal noise ratio, parameter design, Tolerance design (Basic Conceptual treatment only) 06 Hrs

### TEXT BOOKS:

1. Total quality Management by Dale H. Besterfield (Etal), Pearson Education III, Edition – I, Indian Reprint, 2004.
2. Statistical quality control by Grant Levenworth.

### REFERENCE BOOKS:

1. Statistical Quality Control by Douglas C. Mantego Mary
2. Total Quality Management Texts Cases by K. Shridhara Bhat, Himalaya Publishing House, Edition I, 2002.
3. quality Control and Total Quality Management – P.L. Jain, Tata Mc. Graw Hill Publishing Co. Ltd., New Delhi.
4. A New American TQM – Four Practical Revolutions in Management, Shoji Shiba, Alan Graham & David Walden, Productivity Press, Portland (USA).
5. Managing for total Quality, N. Loothetis, Prentice Hall of India, New Delhi, 2002.

**Scheme of Exam:** Total **EIGHT** questions are to be asked, **FOUR** from each part. The student has to answer any **FIVE** full questions selecting at least **TWO** from each part.

## MINE ENVIRONMENT AND ECOLOGY

**Sub Code : 10MN 842**  
**Hrs/ Week : 04**  
**Total Hrs. : 52**

**IA Marks : 25**  
**Exam Hours : 03**  
**Exam Marks : 100**

### Part-A

- 1. Introduction:** Definition of Environment and Ecology, Subdivision of ecology ecosystem – classification of ecosystem, structural and functional components of ecosystem, energy flow in the ecosystem. Trophic structure, ecological pyramids.  
**Bio-Geo-Chemical Cycles:** Types, sulphur cycle, Phosphorous cycle, Nitrogen cycle, Carbon cycle, Hydrological cycle. Impact of human on environment. Development and preservation of ecosystem, soil conservation, soil erosion, afforestation. 07 Hrs
- 2. Mining and the Environment:** Mineral Production, History of environmental problems. Range and importance of environmental problems: Nature of problems factors influencing the nature and extent of environmental impact. Visual Impact; landscape analysis, sources of visual impact, landscape planning 06 Hrs  
**Air Pollution:** Nature and effect of the main pollution's: Gaseous pollutants like point source, Non point sources, Dust formation and movement, Measurement and monitoring, ambient measurement, source measurement, monitoring program, effect of air pollution such as greenhouse effect, depletion of ozone layer and its effects. 06Hrs
- 3. Water pollution:** Introduction of various types of water in the mineral industries, Individual Pollutants: Specific pollution problems, such as acid mine drainage, heavy metal pollution, eutrophication, De-oxygenation. 06 Hrs

### Part-B

- 4. Control of Air & Water Pollution:** air pollution control, control of particulate of point source and non-point sources, control of gases-point and non-point sources and disposal of collected pollutants. Control of water Pollution: Monitoring sampling procedures, water control, handling of polluted water, water treatment water quality standards. 07 Hrs
- 5. Noise Pollution:** Problems of noise, noise sources and levels, remedial measures Ground vibration: Nature of ground vibration from blasting, measurement & recording, prediction of ground vibration levels, effects of ground vibrations. 07Hrs
- 6. Air Blast:** causes of air blast, effects of air blast, remedial measures. 06 Hrs
- 7. Tailing Dams:** construction of upstream & down stream tailing dams, construction of centerline methods & their advantages & disadvantages. Problems associated with tailing dams. Reclamation planning. Land use analysis, reclamation techniques, problems, revegetation process.  
**E.I.A. & E.M.P.:** Base line studies, importance of environmental impact assessment, Environmental impact assessment, environmental management plan. 06 Hrs

### TEXT BOOKS:

1. Environmental Impact of Mining, C.G. Down Ph.D. and J. Stock, Second Edition Applied Science Publishers Ltd. London, 1980.
2. Environmental management of Mining Operations, B.B. Dhar, Ashish Publishing House, New Delhi, 1986.

### REFERENCE BOOKS:

1. Surface Mining Environment and Reclamation A. Hussain Samya, Standard Publishers, 1998.
2. Mine Environment and Management (An Indian Scenario), A.B.Choudhury, Ashish Publishing House, New Delhi, 1992.
3. Environmental Pollution Control Engineering, C.S. Rao, Wiley Eastern Ltd. 1992.
4. Environmental Challenges C.K. Varshney D.R. Srdesai, Wiley Eastern Ltd. 1993.
5. Environmental Issues in Mineral Resources Development K.L. Rai, Gyan Publishing House, 1993.
6. The Impact of Mining on the Environment, Problems and Solutions, Oxford and IBH, New Delhi, 1994.
7. Water Pollution, Causes, effects and Control, P.K. Goel, New Age International Publishers, 1997.

**Scheme of Exam:** Total **EIGHT** questions are to be asked, **FOUR** from each part. The student has to answer any **FIVE** full questions selecting at least **TWO** from each part.

## MINING PROJECT

**Sub Code : 10MN 85**  
**Hrs/ Week : 03**  
**Total Hrs. : 52**

**IA Marks : 25**  
**Exam Hours : 03**  
**Exam Marks : 100**

### **Objectives:**

1. To encourage the students to work in a group so that they will develop team and leadership qualities.
2. To make the students to learn the preparation of a detailed project proposal, execution of the project and preparation and presentation of a final project report.
3. To develop in the students multi skills.
4. To develop in the students communication skills.

### **Guide Lines for Project Work:**

1. Project can be undertaken in-house or in a industry or in a research / service organization.
2. Generally a Project batch consists of a minimum of 2 students and a maximum of 4 students.
3. The Project Synopsis should be approved within a period of 15 days by a committee consisting of Head of the concerned department as a Chairman and two senior teachers of the department of which one may be the internal guide.
4. The topic of the project may be in the same branch in which the student is studying, or it may be multidisciplinary. It may involve investigation/ analytical study / experimental work / fabrication / Statistical study / simulation etc. it may also be field oriented. The project should be preferably be taken in the latest trends in Engineering and Technology.
5. There should be a project monitoring committee in each department consisting of Head of the Department and two senior teachers of the Department.
6. Attendance for Project Work will be treated on par with any other practical / practical course.
7. Laboratory slot of 4 hours / week as indicated in the scheme is to be provided by the department.
8. The staff members will be shown a load of 3 hours (1 ½ units) for guiding, generally 4 batches of students.