

Syllabus for the post of Mines Manager, Assistant Managers/ safety officer/ Vocational training officer:

(a) General knowledge

General knowledge

History, geography, culture, sports, scientific research, knowledge of current events, general politics, Indian constitution, science – inventions & discoveries, economy, banking, finance, capitals, current affairs.

(a) Mine management, Legislation and general safety

Mine management

Introduction, Personal Management and Organizational behavior, Production Management, Financial Management, Economic Impact of Mining, Materials Management for mining sector, Mine accidents, CPM and PERT.

Mine Legislation:

Health and Safety Laws: The Mines Act, Mines Rules, Coal Mine Regulation, Mines Rescue Rules, provisions of Indian Electricity Rules applicable to mines; Mine Vocational Training Rules, Mine creche rules, other rules and legislation applicable to coal mines.

General safety in mines:

Safety in mines, risk management, First-aid, sanitation and health, Lighting

(b) Winning and Working

Geology

Occurrences of coal, Indian coalfields, Geological structures, Boring and Trenching, etc.

Mine Developments

Various accesses to the mines, Choice of methods of mining coal seams and factors affecting the same, statutory provisions.

Mining Methods

Underground and Opencast various mining methods for coal extraction from development to depillaring with associated works.

Drilling and Blasting

Drilling, Classification, Principles, types and cost, Types and properties of explosives, permitted explosives, composition and testing of safe explosives, Mili-second detonators, alternatives of explosives, Use and safe handling of explosives in coal in gassy and non-gassy mines, blasting techniques and their relative efficiency, powder factor, total cost concept.

Rock Mechanics and Slope stability

stress, strain – compressive and tensile, shear strength, uniaxial and tri-axial strength, Poisson's Ratio, Young's Modulus, convergence, elasticity, lithostatic and hydrostatic pressure, rock mass classifications, strength of stooks, shaft pillars, protection of surface structures, design and stability of structures in rock, dynamic and static loading, measuring instruments, economics of support design, subsidence; caving of rock mass, bumps; monitoring of rock mass performance; mechanics of rock fragmentation, slope stability and dump stability, dump management.

(c) Surface environment, Mine Ventilation and Hazards

Surface environment

Mining Environment: EIA (Environment Impact Assessment), EMP (Environment Management Plan), ETP(Effluent Treatment Plant), STP (Sewerage Treatment Plant) threat to environment from underground and surface mining, means of mitigation, treatment of pollutants, monitoring systems, water management, mine closure plan, R&R (rehabilitation and re-settlement).

Mine Ventilation and Hazards

Mine atmosphere, Mine gases, flame safety lamp, methanometers and multi-gas detectors, gas chromatograph, methane layering; monitoring of different gases, telemonitoring, coal bed methane/coal mine methane, Heat and humidity, geothermal gradient, Air-flow in mines, Natural Ventilation and Mechanical Ventilation, Airborne dust, Mine fires and dealing with it, Mine explosions, Fire extinguishers, Mine inundation, rescue and recovery in mines, rescue apparatus, organization of rescue work, emergency preparedness and response system.

(d) Mine Machineries, Electricity and Mine surveying

Mine machineries

Various machineries used in mining, Wire ropes, Mine winders, Material handling machineries, Pumps, Maintenance systems.

Mine electrical

Generation, Transmission and distribution, power economics, industrial tariffs, cables, switch gears, mine signaling, electrical drives and semiconductor controllers, flameproof enclosures and intrinsic safety, use of high voltage operational equipment in mines.

Mine surveying

Introduction and basic principles of surveying, Linear and angular measurements, Leveling, Controlled survey, Correlation, Theory of errors and adjustments, Theory of

errors and adjustments, area and volume calculations, Types of plans their preparation, care, storage and preservation, legislation concerning mine plans and sections, duties and responsibilities of surveyors, photogrammetry, GPS and GIS application in mining, Dip and strike problems, Application/software used in mine surveying and preparation of plans.