

Syllabus for the post of Mines Surveyor and Overman / Vocational training instructor:

(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.

(b) Mine management, Legislation and General safety

Mine management and legislations

Introduction, personal management and organizational behavior, production management, financial management, economic impact of Mining, materials management for mining sector, mine accidents. CPM and PERT, 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, Silicosis and pneumoconiosis, mine disease its symptoms, prevention and treatment.

(c) Mine development, Mining methods and Surveying

Mine development and Mining methods

Geology, nature and occurrence of coal seams, geological features of coalfields, methods of boring, borehole survey, interpretation of geological maps.

Methods of access to deposits, developments and layout of mines including surface and underground arrangements, choice of mining coal seams and factors affecting on it, box cut, types of selection of site, formations and productions of benches, types of rippers, blast hole drills, requirement of number of drills, bench design parameters, performance parameter, blast design, calculation of charge per hole, ground vibrations, secondary blasting, side casting, properties of explosives and its accessories, use and safe handling of explosives, blasting techniques, continuous and cyclic mining, rock mass classifications, dynamic and static loading, measuring instruments, mechanics of rock fragmentation, slope stability, dump stability, dump management, safety aspects and statutory provisions.

Surveying

Introduction and basic principles of surveying, Linear and angular measurements, dial, Levelling, 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, statutory provisions.

(d) Mining Machineries and Mine electrical

Mining machineries

Generation and transmission of mechanical, hydraulic and pneumatic power, wire ropes constructional details, applications, mechanical properties and breaking load and factor of safety, fleet angle, inspection and rope capping and splicing, Mine winder and its types and applications, drives and control systems, brakes, cage, skip, counter weight, motor power calculation, safety devices, non-destructive tests, statutory provisions.

Underground and surface machineries use in coal mining, safety, maintenance and calculations, locomotives, conveyor systems, aerial ropeways, coal handling plants, mine pumps, types, characteristics, sumps, pumping problems, statutory provisions.

Mine electrical

Generation, transmission and distribution of electrical power in mines, power economics, tariff plans, power factor improvements, substation arrangements, cables, switch gears, protective devices, circuit breakers, gate-end-box, earthing, flameproof enclosures, intrinsic safety, and use of high voltage operational equipment in mines, statutory provisions.

(e) Surface environment, Mine ventilations and Hazards

Surface 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, acid mine drainage (AMD) treatment of pollutants, monitoring systems, water management; mine closure plan; R&R (rehabilitation and re-settlement), statutory provisions.

Mine ventilation

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, statutory provisions.

Mine hazards

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, statutory provisions.