Rajasthan Public Service Commission, Ajmer

SYLLABI OF THE PAPER/SUBJECTS PRESCRIBED FOR THE MAIN EXAMINATION

OPTIONAL SUBJECT

MINING ENGINEERING PAPER-I (Code No. 22)

1. Mining Methods, Surface and Underground: Open cast methods of Mining layout, development and design, drilling and blasting, loading and transportation mechanized quarrying, continuous mining systems. Mining of dimensional stone.
   Underground method of working coal by longwall, Bord and Pillar, mining of thickseams, trends of new development in coal mining.
   Underground mining methods for metalliferous deposits, development and stoping, handling of broken ore, waste material, stope mechanization and mine filling.
2. Mining Machinery : Use of different types of power in mines, drilling machines, wire ropes, rope haulages, conveyors and locomotive. Face machinery-side discharge loader(SDL), load haul and dump (LHD), cutter loaders, continuous miners. Machines for raises, winzes and tunnels. Mine pumps- types and application.
3. Rock Mechanics, Ground Control and Mine Development : Physico-mechanical properties of rocks, rock mass classification, stress measurement techniques. Theories of rock failure, stress distribution around mine working. Mine subsidence, ground control, instrumentation and monitoring. Rock bursts and bumps. Design of support and support system in mine roadways and workings. Pit slope stability. Drilling methods, explosives, blasting devices and practices. Shaft sinking-ordinary and special methods.
4. Special Methods : Hydraulic mining of coal. Gassification of coal. Coal bed methane exploitation. Placer mining. Nuclear blasting and Ocean mining methods.

MINING ENGINEERING PAPER-II (Code No. 22)

1. Mine Legislation and Safety : Introduction to statutory laws related to mining industry - Mines, Minerals (Regulations & Development), Act, Mineral Concession Rules, Mineral Conservation and Development Rules, Mines Act. Coal Mines Regulations and Metalliferous Mines Regulations.
   Mine safety- accidents in mines and their remedial measures. Contribution of ILO and safety conferences in mines. Occupational diseases in mines.

2. Mine Environmental Engineering : Underground mine atmosphere, Detection of mine gases, Mechanics of air flow, distribution and control. Natural and mechanical ventilation. Fan-types, selection and operations, Heat and humidity - sources, estimation and air-conditioning. Ventilation planning.

   Mine fires and explosions. Innudation. Illumination, noise and mine dust measurements, standards and control. Mine rescue and Recovery.

   Environmental impacts of surface mining, Ecology pollution. Environment Management Plan. Erosion and Sedimentation control. Reclamation and land use management.
3. Mine Surveying, Mineral Economics and Mine Planning : Mine surveying instruments, development in instrumentation and techniques. Correlation. Underground surveying. Application of remote sensing in mining.

   Estimation and measurements of mineral resources and reserves. Sampling methods and practices, mining companies and mine accounts. Cash flow concepts and mine valuation. Mining finance, royalty and taxation.

   Principles of mine planning, optimization of mine output, life size and other mine parameters. Preparation of feasibility reports and DPR/production planning and productivity in mining.
4. Mine Management and System Engineering : Principles of scientific management, organization, rationalization, efficiency, engineering standardization, Work study, incentives, standards of performance, training, planning, supervision, industrial psychology, human relationship, operational research, PERT and CPM. Management by objectives.

   The concepts of system engineering. Introduction of system, components and environment; classification of systems, systems planning, system feasibility, planning horizon, economic analysis, economic criteria. Modelling approach for solving of mining problems.

   Application of computer in mining.

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