

SYLLABUS

(Jr. Overman T&S Gr-C)

PART -A	GENERAL ASSESSMENT i. General Knowledge and Current Affairs ii. Reasoning & Mathematical Ability	20 questions	20 Marks
PART -B	DOMAIN KNOWLEDGE 1) <u>General Safety and Legislation</u> Duties and responsibilities of workmen, competent persons and officials (excluding managers, assistant managers); discipline amongst workers and control of staff. Provisions of the Coal Mines Regulations, 2017, relating to Coal mine working; explosives and shotfiring; loading, transportation and dumping; precautions against danger from fire, dust, gas and water and of other provisions and Rules, enforcement of and compliance of provisions under the regulations to which overman is responsible. Writing of reports required to be made by overman under the regulations. Hazard Identification, risk assessment and risk management, safety management plan. Mine Gases: Generation, Properties and Effects, Detection of Mine Gases, Methanometers and Multi Gas Detectors, Gas Chromotograph, Flame Safety Lamps. Dangerous occurrences in mines and dealing with the same; accidents, their causes and preventions; accident reports; not disturbing the place of accident. Mine rescue; physiological effect of mine gases; rescue equipment and First Aid. Sanitation and health; miners' diseases, their symptoms and preventions. 2) <u>Methods of working</u> Nature of occurrence of coal seams; geological disturbances and their effects on working conditions; dangers and precautionary measures while approaching geological disturbances areas. The purpose and utility of boreholes in mines; shaft sinking; safety devices; temporary and permanent supports in sinking and working shafts; examination of shafts and outlets. Opencast methods of mining; mechanized and manual methods; deep hole drilling and blasting; shovel and dumpers; dragline; bucket wheel excavators; surface miner; benching; maintenance of haul roads; precautions while extracting developed pillars by opencast method and other safety precautions; methods of reclamation; dump management; high wall mining. General principles of bord and pillar and longwall method; multi-section workings; methods of depillaring under	80 questions	80 Marks

different conditions; mechanized pillar extraction; precautions to be taken while working near/beneath waterlogged areas; roof convergence and convergence measuring devices etc., stone drifting. Elements of roof control Rock Mass Rating (RMR) of roof strata; mechanism of roof bolting; support of roadways; face supports and their types, setting, testing and withdrawal; systematic support rules; packing and stowing; protection of surface structures; working beneath statutorily restricted areas and surface structures. Safe handling and use of explosives in coal and stone; simultaneous short firing; blasting in fire areas in opencast mines; safety precautions. Inspection of workings; inspection and maintenance of haulage and travelling roadways; man riding system and return airways; gates and fences etc. Suppression and treatment, sampling and analysis of mine dust. Sources of danger from surface water and underground inundation; precaution to prevent inundation and irruption of water; water dams, water danger plans. Gates and fencing, different kind of fences. Reading of statutory plans.

3) Ventilation, Precautions against Explosions, Fires and Inundation

Natural and mechanical ventilation ; ventilation of headings and sinking shafts; siting of auxiliary and booster fans; distribution, measurement and control of air in mines; estimation of air quantity requirements; methods of coursing of air; anemometer; hygrometer; maintenance of ventilation appliances. Pollution of air; irruption/occurrence of gases in mines; properties of gases; detection and measurement of firedamp and noxious gases; sampling of air; determination of environmental condition; standards of ventilation. Design and construction of flame and electric safety lamps; their use, examination and maintenance. Suppression and treatment of coal dust; suitability of stone dust; sampling and analysis of mine dust. Elementary knowledge of causes and prevention of firedamp and coal dust explosion, limits of inflammability of firedamp. Prevention, detection and control of spontaneous heating / fire; sealing off fire areas; fire stopping and their examination; precautions against outbreak of surface fires; fire fighting on surface and belowground. Inspection of old workings. Sources of danger from surface and underground water, precaution to prevent inundation and irruption of water; precautionary measures while approaching abandoned and water logged areas, boring machines for exploratory work; water dams; water danger plan. Recovery of mines after explosions, fires and inundation; precautionary measures during re-opening and dewatering of mines.

	<p>4) Elements of Mining Machinery</p> <p>Safety aspects and safe use of different kinds of machinery used in underground and opencast mines e.g. SDLs, LHDs, Continuous Miners, Shuttle Cars, Crushers, Conveyors, blast hole drills, rippers; scrappers; shovels; draglines; dumpers; road graders; dozers; wheel loaders; bucket wheel excavators; spreaders; surface miners; Brakes (including service and parking brakes); Use of steam and internal combustion engines in mines. Application of electricity in mines; safety precautions. Winding equipments; ropes and guides; signaling and decking arrangements; safety devices; examination of winding equipments and shaft fittings. Haulage and transport; types of haulage; rope haulage and locomotives; self-acting inclines; haulage roads in underground and opencast working; rails and tracks; their maintenance and inspection; tubs; signaling; safety devices; codes of practices; traffic rules; unsafe practices; derailments. Different types of pumps; principles and use of siphons; drainage and water lodgments. Code of practice for transport, installation, erection, use and shifting of underground and opencast machinery. Belt conveyors and safety appliances.</p>		
TOTAL	100 questions	100 marks	