

RAJASTHAN PUBLIC SERVICE COMMISSION, AJMER

SYLLABUS FOR COMPETITIVE EXAMINATION FOR THE POST OF ASSISTANT MINING ENGINEER FOR MINES AND GEOLOGY DEPARTMENT

UNIT 1: Basic Concepts of Mining and Geology-

Basic Concepts of Mining: Terminology, Mineral and energy resources of Rajasthan, India and World, Resources of dimensional stones in Rajasthan and India, Export policy of minerals, problems in small scale stone industries.

Geology: Basic terminology of engineering and economic geology; Prospecting and exploration-Principles and techniques; types of rocks; Classification of minerals and their properties; Study of topographic maps; Ore and gangue; Processes of ore formation; Major and Minor Indian mineral deposits-distribution and mode of occurrence; Earthquakes and seismicity, Seismic zones of India.

UNIT 2: Mine Development and Surveying-

Mine Development: Methods of access to deposits; Underground drivage; Drilling: principles, patterns, methods and machines; Explosives, Initiation systems, blast design, controlled blasting practices; fragmentation assessment, blasting monitoring and Instrumentations.

Mine Surveying: Levels and levelling, theodolite, tacheometry, triangulation; Contouring; Errors and adjustments; Correlation; Dip fault problems; Underground surveying; Curves; Photogrammetry; EDM and Total Station; Application of GPS, DGPS; GIS and Remote sensing in mining; Drone survey and its application in Mining

UNIT 3: Geomechanics and Ground Control-

Geomechanics: Geo-technical properties of rocks; Rock mass classification; Instrumentation and stress measurement techniques; Theories of rock failure; Ground vibrations; Stress distribution around mine openings; Subsidence; Rock bursts and coal bumps; Slope stability.

Ground Control: Design of pillars; Roof supporting systems; Mine filling, Instrumentation.

UNIT 4: Mining Methods and Machinery-

Mining Methods: Surface mining: layout, development, loading, transportation and mechanization, continuous surface mining systems; Dimensional stone mining methods, machineries and end product process; Underground coal mining: bord and pillar systems, room and pillar mining, longwall mining, thick

seam mining methods; highwall mining; Underground metal mining: open, supported and caved stopping methods, stope mechanization, ore handling systems.

Mining Machinery: Generation and transmission of mechanical, hydraulic and pneumatic power; Materials handling: haulages, conveyors, face and development machinery, hoisting systems, pumps, crushers, continuous miners and associated machineries.

UNIT 5: Surface Environment, Mine Ventilation, and Underground Hazards-

Surface Environment: Air, water and soil pollution: Standards of quality, causes and dispersion of contamination, and control; Noise; Land reclamation, Environmental Impact Assessment (EIA); Environment Management Plan (EMP); Role of Pollution Control Boards, Ministry of Environment and Forest

Mine Ventilation: Underground atmosphere; Heat load sources and thermal environment, air cooling; Mechanics of air flow, distribution, natural and mechanical ventilation; Mine fans and their usage; Auxiliary ventilation; Ventilation planning; Ventilation networks.

Subsurface Hazards: Mine Gases. Underground hazards from fires, explosions, dust and inundation; Rescue apparatus and practices; Safety in mines; Accident data analysis; Mine lighting; Mine legislation; Occupational safety.

UNIT 6: Mine Economics, Mine Planning, Mine Management -

Mine Economics: Mineral resource classification; resource reporting standards; Discounted cash flow analysis; Mine valuation; Mine investment analysis; Mineral taxation.

Mine Planning: Sampling methods, practices and interpretation; Reserve estimation techniques: Basics of geostatistics and quality control; cutoff grade; bench geometry; Pit planning and design; Production scheduling; Work-study, Feasibility report, Detailed project report.

Mine Management: Personnel management, training, productivity, PERT, CPM, purchase and store management, Inventory control, budget & budgetary control.

UNIT 7: Mine Legislation-

Prerequisite for Starting of a Mine: Approval of Mining Plan and Mine Closure Plan, Grant of Mining Lease, Environment and Forest Clearances, Wild Life Clearance, Safety, Rehabilitation of project affected families, welfare of workers etc.

Regulatory Framework for the Exploration and Extraction of Mineral Resources: National Mineral Policy 2019; Mineral Concession Rules; Mineral Conservation

and Development Rules; Mineral (Auction) Rules 2015; Mines Act-1952, Coal Mine Regulation-2017, Metalliferous Mine Regulation-1961; Offshore Areas Mineral (Development and Regulation) Act 2002; Rajasthan Minor Mineral Concession Rule-2017; Rajasthan Mineral Policy-2015; Rajasthan M. Sand Policy-2020; Mines and Minerals (Contribution to DMF) Rules-2015; Foreign Direct Investment Policy for mineral sector; Regulatory authorities; DGMS circulars.

Scheme of examination and syllabus for the post of Assistant Mining Engineer

(i) Written Examination - 150 Marks

S. No.	Subject	No. of Questions	Total Marks	Examination Duration
1	Mining Engineering	150	150	2.30 Hours
	Total	150	150	

1. The competitive examination shall carry 150 marks and 150 questions of Multiple Choice Type questions.
2. There shall be one paper. Duration of Paper will be Two hours and Thirty Minutes.
3. Negative marking shall be applicable in the evaluation of answers. For every wrong answer one-third of the marks prescribed for that particular question shall be deducted.

Explanation: - Wrong answer shall mean an incorrect answer or multiple answers.

उक्त पद हेतु आयोजित की जाने वाली परीक्षा के लिए ओ.एम.आर. उत्तरपत्रक में प्रश्नों के विकल्प भरने के संबंध में विशेष निर्देश:-

1. Each question has five options marked as 1, 2, 3, 4, 5. You have to darken only one circle (bubble) indicating the correct answer on the Answer Sheet using BLUE BALL POINT PEN.
2. It is mandatory to fill one option for each question.
3. If you are not attempting a question then you have to darken the circle '5'. If none of the five circles is darkened, one third (1/3) part of the marks of question shall be deducted.
4. After solving question paper, candidate must ascertain that he/she has darkened one of the circles (bubbles) for each of the questions. Extra time of 10 minutes beyond scheduled time, is provided for this.

A candidate who has not darkened any of the five circles in more than 10% questions shall be disqualified.