

AMMI-10 MINE MACHINERY-II

UNIT-1 WINDING ENGINES

- 1.1 Winding systems, drum winders, drives, mechanical braking of winders, safety devices in winding, overwind and overspeed protection,
- 1.2 Koepe and multi-rope friction winding, electrical layouts.
- 1.3 Duty cycles of drum winders of different drum cross-sections.
- 1.4 Special problems of deep shaft winding.

UNIT-2 WINDING ACCESSORIES AND LAYOUTS-I

- 2.1 Head gear and their design, head sheave, cages and skips,
- 2.2 Suspension gear, shaft fittings and appliances – guides, keps, etc.,
- 2.3 Signaling systems,
- 2.4 Winding calculations relating to rope size & numbers,
- 2.5 Capacity & power requirement for cages, skips, drum and Koepe winding systems.

UNIT-3 WINDING ACCESSORIES AND LAYOUTS-II

- 3.1 Surface and Pit-bottom layouts
- 3.2 Mine car circuits at the surface and pit bottom, creepers, skip winding
- 3.3 Loading and discharge arrangements.
- 3.4 Case studies, railway sidings and layouts.

UNIT-4 COAL FACE MACHINERY

- 4.1 Construction, salient mechanical and electrical features and operations of coal drills and their control panels, coal cutters,
- 4.2 Different types of mechanical loaders coal ploughs,
- 4.3 Cutter loaders and continuous miners;
- 4.4 Development road headers in face mechanisation,
- 4.5 Longwall mining equipment, electrical and hydraulic layouts;
- 4.6 Condition monitoring of mining machinery for underground and opencast mines and ore handling plants, modern concepts in underground mine mechanization.

UNIT-5 EXCAVATION AND LOADING MACHINERY IN SURFACE MINES

- 5.1 Classification.
- 5.2 Hydraulic system diagram.
- 5.3 Under carriage.
- 5.4 Design and Constructional details of Front end loaders,
- 5.5 Hydraulic excavators and Electric Rope shovel, Backhoe, Dragline,
- 5.6 Bucket Wheel Excavator. Bucket Chain Excavator and Surface Miners.

UNIT-6 OTHER MACHINERY IN SURFACE MINES

- 6.1 Classification of transport equipment's;

- 6.2 Understanding of construction and technical specifications of Dumpers of different types including multi-axial dumpers,,
- 6.3 Tractors, trailers, dump trucks,
- 6.4 Rippers (types), Motor Graders,
- 6.5 Bull Dozers, Rock breakers, Road Compactors, Water Tankers.

Reference Books:

1. Hartman, H. L. (Editor), SME Mining Engineering Handbook, 3rd edition, Vol I & II, Society of Mining Engineers, New York, 2011.
2. Cherkassky, B.M., Pumps, Fans, Compressors, MIR Publishers, 1980.
3. Deshmukh, D.J., Elements of Mining Technology, Vol. I, II and III, EMDEEE Publishers, Nagpur, 1979.

