Roll No. | | | | | | | | | | |

**ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)**

**B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, APRIL / MAY 2025**

**MINING ENGINEERING**

**VIII Semester**

**MI 5016 MATERIAL HANDLING**

(Regulation 2019)

Time:3 hours Max. Marks : 100

| | |
|---|---|
| CO1 | Design and Application of Hoisting Systems |
| CO2 | Application of men and material transport system |
| CO3 | Design concept of scraper haulage, aerial ropeway and belt conveyor system in mines |
| CO4 | Design and Constructional Features of Existing and Modern Belt Conveyors |
| CO5 | Material Handling Systems and its principle to convey the minerals or materials from mines, plants and workshops. |

**BL – Bloom's Taxonomy Levels**
(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

## PART- A ( 10x2=20 Marks)

(Answer all Questions)

| Q. No | Questions | Marks | CO | BL |
|---|---|---|---|---|
| 1. | Name a few machinery that can be used to lift ROM ore over benches in an open cast mine. | **2** | 1 | L1 |
| 2. | How is over-winding prevented in a hoisting system used in underground mine? | **2** | 1 | L2 |
| 3. | Write short notes on causes for overturning of Mobile cranes. | **2** | 2 | L1 |
| 4. | Write short notes on reclaiming bulk materials with high flowability from a stock pile. | **2** | 2 | L2 |
| 5. | A conveyor belt experiences excessive stretch. What could be the possible causes and corrections to be done? | **2** | 3 | L4 |
| 6. | Name the various devices and components present in an Aerial ropeway. | **2** | 3 | L1 |
| 7. | Write short notes on the areas of applicability of Screw Conveyors. | **2** | 4 | L3 |
| 8. | List a few advantages of using sidewall belt conveyors. | **2** | 4 | L2 |
| 9. | Write short notes on the need for blending in a mine. | **2** | 5 | L2 |
| 10. | Write four suggestions that can be practised considering Safety principle for materials handling in a large granite quarry. | **2** | 5 | L3 |

## PART- B (5x 13=65 Marks)

| Q. No | Questions | Marks | CO | BL |
|---|---|---|---|---|
| 11 (a) | A Skip Hoisting System has to be developed for an underground mine. List down the various principles you will consider. Describe in detail about the Safety Principle and Maintenance Principle. | **13** | 1 | L2 |
| | **OR** | | | |
| 11 (b) | Describe the various components of a Bucket Elevator with a neat sketch. Highlight the types, areas of applicability and safety features needed for Bucket elevators. | **13** | 1 | L2 |
| 12 (a) | Describe the various characteristics of Bulk materials. Describe in detail any two of them highlighting applicability in design of conveying systems. | **13** | 2 | L3 |
| | **OR** | | | |
| 12 (b) | List down the various parameters to be considered in selection of Materials Handling Equipment for transportation in an opencast iron ore mine. | **13** | 2 | L3 |
| 13 (a) | Describe in detail about a pneumatic conveying system used for transporting fly ash in a thermal power plant with a neat sketch. | **13** | 3 | L3 |
| | **OR** | | | |
| 13 (b) | Describe any 5 major Belt Conveyor troubles encountered during operations and the corrective measures that can be taken to rectify the same. | 13 | 3 | L3 |
| 14 (a) | Describe the parts of Pipe Belt conveyor system with neat sketch, highlighting the advantages and limitations of its usage. Highlight the considerations needed for conveying iron ore in a hilly terrain. | **13** | 4 | L4 |
| | **OR** | | | |
| 14 (b) | Describe the parts of a cable belt conveyor system with neat sketch, highlighting the advantages and limitations of its usage. Highlight the considerations needed for conveying iron ore for a distance of 15 kilometres in a hilly terrain. | **13** | 4 | L4 |
| 15 (a) | Name 4 types of Stackers. Describe about the construction, working, maintenance of a Stacker cum Reclaimer with a neat sketch. | **13** | 5 | L3 |
| | **OR** | | | |
| 15 (b) | Name 4 types of Mobile Bulk Materials Handling equipment. Describe about the construction, working, maintenance of any one type with a neat sketch. | **13** | 5 | L3 |

## PART- C (1x 15=15 Marks)

(Q.No.16 is compulsory)

| Q. No | Questions | Marks | CO | BL |
|---|---|---|---|---|
| 16. (i) | Describe an iron ore handling belt conveyor system used in a port with a neat sketch. | **7** | 5 | L5 |
| (ii) | Describe the various resistances that contribute to the effective tension in a belt conveyor system. Highlight the effect of oil leaks and the corrections you will carry out. | **8** | 5 | L6 |