

22380

12425

03 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Illustrate your answers with neat sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Assume suitable data, if necessary.
(5) Use of Non-programmable Electronic Pocket Calculator is permissible.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : 10
- Define circular bench slope failure with diagram.
 - Explain the terms stripping ratio and overall stripping ratio.
 - Write the process flow chart for unit operations involved in surface mining production.
 - State the applicability conditions for dragline.
 - Write down the graphical representation for classification of surface mining machinery.
 - Define explosive and enlist its ingredients.
 - Define spacing and burden in respect of opencast blasthole geometry.

P.T.O.

- 2. Attempt any THREE of the following :** **12**
- a) Describe the causes of bench slope failure in opencast mining.
 - b) Explain boxcut with neat sketch.
 - c) Compare ANFO with Heavy ANFO on the basis of its properties and strength.
 - d) Describe shocktube initiation system in surface mine blasts.
- 3. Attempt any THREE of the following :** **12**
- a) Describe operating components of the productive drilling system.
 - b) Explain inpit crushing system.
 - c) Enlist various type of delivery system of bulk explosive and explain any one of them.
 - d) Describe how the rock is fragmented by blasting.
 - e) Elaborate general safety measures for blasting practices in surface mines.
- 4. Attempt any THREE of the following :** **12**
- a) Explain the statutory provisions regarding bench height and bench width.
 - b) Explain breakeven stripping ratio with its significance in opencast mining.
 - c) Describe precautionary measures while use of HEMM in surface mining.
 - d) Enlist the various controlled blasting techniques and explain any one of them.

5. Attempt any TWO of the following : 12

- a) Enlist the various methods of overburden removal and explain extended bench overcasting by dragline.
- b) With a neat sketch, explain the operating parameters of a shovel.
- c) Justify the precautions while mixing, charging and firing of ANFO explosive.

6. Attempt any TWO of the following : 12

- a) A project of manganese mine (sp. gr. 4.8) is to produce 3 million tons of mineral per year. It has to remove 40% of waste. Calculate the following -
 - i) No. of Hydraulic shovels of 6 m³ capacity with 60 tonner rear dumper.
 - ii) No. of Dumpers require for 2.5 km haul distance to crusher plant.

Following are the assumptions :-

- Cycle time of shovel = 30 sec.
 - One round of dumper trip = 20 min
 - Shovel availability = 75%
 - Dumper availability = 70%
 - Assume suitable conditions if necessary.
- b) Illustrate the working and operation of a surface miner with neat sketch.
 - c) Explain in detail the effects, causes and prevention of noise pollution.
