

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

## **GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2022**

**Subject Code:3172211**

**Date:07-01-2023**

**Subject Name:Advanced Mining Methods**

**Time:10:30 AM TO 01:00 PM**

**Total Marks:70**

**Instructions:**

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Simple and non-programmable scientific calculators are allowed.**

**MARKS**

- Q.1**
- |     |  |           |
|-----|--|-----------|
| (a) | Write the applicability conditions of horizon mining system.   | <b>03</b> |
| (b) | Discuss the problems in mining of thin coal seams?   | <b>04</b> |
| (c) | What do you mean by powered supports? Explain its purposes. Also write the factors affecting the selection of powered supports system. | <b>07</b> |

- Q.2**
- |     |   |           |
|-----|---|-----------|
| (a) | What are the factors affecting the division of a seam into slices?                              | <b>03</b> |
| (b) | What do you mean by slice mining? Also explain the order of slicing in detail with neat sketch. | <b>04</b> |
| (c) | Explain horizon mining with its features. State its advantages and disadvantages.               | <b>07</b> |

**OR**

- |     |   |           |
|-----|---|-----------|
| (c) | Describe the types of machineries are used in thin seam extraction. | <b>07</b> |
|-----|---|-----------|
- Q.3**
- |     |   |           |
|-----|---|-----------|
| (a) | Discuss the principle of action of roof bolts.  | <b>03</b> |
| (b) | Discuss the factors affecting the planning of distance between Horizons in details.                             | <b>04</b> |
| (c) | What is horizontal slicing method? Discuss horizontal slicing in ascending order with stowing with neat sketch. | <b>07</b> |

**OR**

- Q.3**
- |     |   |           |
|-----|---|-----------|
| (a) | Write the applicability conditions of inclined slicing with caving in descending order.           | <b>03</b> |
| (b) | How optimum distance between horizons and crosscuts can be determined? Explain briefly.           | <b>04</b> |
| (c) | Describe the methods of establishing linkage between bore holes in underground coal gasification. | <b>07</b> |

- Q.4**
- |     |   |           |
|-----|---|-----------|
| (a) | Write a short note on sublevel caving.  | <b>03</b> |
| (b) | How breaking down of coal is done in hydraulic mining? Explain briefly.                           | <b>04</b> |
| (c) | What are the main components of powered supports system? Explain Shield support with neat sketch. | <b>07</b> |

**OR**

- Q.4** (a) How face development is done in thin seam mining method? **03**  
(b) Write the advantages and disadvantages of underground coal gasification? **04**  
(c) Describe the methods or ways to transport the broken coal in hydraulic mining. **07**

- Q.5** (a) What do you understand by radioactive minerals? Name the methods of mining used for radioactive minerals. **03**  
(b) Discuss the advantages and disadvantages of hydraulic mining of coal. **04**  
(c) Write the conditions suitable for underground gasification of coal. Also discuss the constituent processes of underground coal gasification. **07**

**OR**

- Q.5** (a) Write a short note on ore mining by leaching. **03**  
(b) Explain principle of underground coal gasification with schematic diagram of UCG system. **04**  
(c) Explain deep -sea mining for manganese nodules. **07**

\*\*\*\*\*