Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER- V EXAMINATION-SUMMER 2023

Subject Code: 3152206 Date: 03/07/2023

Subject Name: Underground Coal Mining

Time: 02:30 PM TO 05:00 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)**	List out the factors affecting the choice of coal mining methods.	**03**
	(b)	Explain theories of origin of coal in detail.	**04**
	(c)	Discuss the factors affecting the size of pillars in bord and pillar mining.	**07**
Q.2	**(a)**	What are the principles of pillar extraction techniques?	**03**
	(b)	What are the factors affecting the layout of longwall face? Explain briefly.	**04**
	(c)	Briefly explain the method of development of bord and pillar mining by blasting off the solid. Also draw the sketches of patterns of shotholes.	**07**
		OR	
	(c)	Differentiate between Mechanical Stowing and Pneumatic Stowing.	**07**
Q.3	**(a)**	What do you mean by rank of coal?	**03**
	(b)	What are the various means of access of opening up of coal seam? Explain with neat sketch.	**04**
	(c)	How number of pillars is calculated? Explain with one example.	**07**
		OR	
Q.3	**(a)**	Draw a neat sketch of a longwall advancing double unit face & name the elements.	**03**
	(b)	How to determine the panel size in Bord and Pillar method of working? Explain briefly.	**04**
	(c)	How development is done by using continuous miner? Also draw a layout for development of five heading using continuous miner.	**07**
Q.4	**(a)**	When do we need to support mines and why?	**03**
	(b)	How to calculate percentage of extraction during development & depillaring? Explain with one example.	**04**
	(c)	Explain pillar extraction techniques in detail.	**07**
		OR	
Q.4	**(a)**	Name the different parts of a shearer with a schematic line diagram.	**03**
	(b)	Explain longwall retreating method with neat sketch.	**04**
	(c)	What are the operations involved & facilities provided in a mixing chamber of sand stowing? Draw a neat sketch.	**07**
Q.5	**(a)**	What are the ideal characteristics of stowing material used in stowing?	**03**
	(b)	What do you mean by roof bolting? Also explain its principle of action and functions.	**04**
	(c)	Give a brief idea about hydraulic and friction props.	**07**
		OR	
Q.5	**(a)**	Under what circumstances, depillaring with stowing method is adopted?	**03**
	(b)	State the advantages and disadvantages of mechanical stowing.	**04**
	(c)	Discuss the process of hydraulic stowing with a neat sketch.	**07**