Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2020

Subject Code:3152206 Date:29/01/2021

Subject Name:Underground Coal Mining

Time:10:30 AM TO 12:30 PM Total Marks: 56

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			Marks
Q.1	**(a)**	Write short note on occurrence of coal in India	**03**
	(b)	Explain drift and in-situ theory of origin of coal.	**04**
	(c)	Explain the factors influencing the choice of coal mining method.	**07**
Q.2	**(a)**	Define: i. Incubation period ii. Crosscut iii. Panel	**03**
	(b)	A developed panel for a coal seam is having incubation period of 6 months has 32 square pillars under extraction having sides 25m and height 3.0m. Density of coal is 1.4 tonne/m^3. Extraction ratio during depillaring is expected to be 75%. To depillar the panel within the incubation period, assuming 25 working days in a month, the production from the panel in tone/day should be _____.	**04**
	(c)	State the circumstances under which bord and pillar working is preferred. Give reason why this method is generally adopted in India.	**07**
Q.3	**(a)**	List the advantages of bord and pillar method.	**03**
	(b)	A longwall panel with a face height of 3.0m and face length of 150m is worked in 3 shifts per day employing 40 men per shift. The depth of the web of the shearer cutting coal is 0.5m. The unit weight of the oal is 1.4 tonne/m^3. Two full face cuts are executed per shift. The daily production from the panel in tonne is _____.	**04**
	(c)	State the considerations to be borne in mind when developing a steep seam with the help of a coal cutting machine.	**07**
Q.4	**(a)**	Give the factors influencing the size of panel.	**03**
	(b)	A 2.5m thick coal seam lying at an average depth of 100m has been developed by bord and pillar method. The width of the pillars is 30m (centre to centre) and the gallery width is 4m. The average density of the overlying strata is 26kN/m^3. Extraction ratio during the development of the pillar is _____.	**04**
	(c)	Compare longwall retreating and advancing method.	**07**
Q.5	**(a)**	Explain pneumatic stowing.	**03**
	(b)	A coal seam of 2m thickness is extracted by a longwall retreating panel with a face length of 120m. Web depth of the shearer is 0.6m. Average manpower in the longwall face in a shift is 20. The specific graity of in-situ coal is 1.4. If the hearer makes 4 full-face cuts in 3 shifts, the face OMS in tonne is _____.	**04**
	(c)	Write short note on: i. Pipe jams in hydraulic stowing ii. H/L ratio	**07**

Q.6	**(a)**	Explain the advantages and disadvantages of mechanical stowing.	**03**
	(b)	Describe the process of hydraulic stowing a goaf on a longwall face 100m long.	**04**
	(c)	Give the layout of stowing pipes from surface to the goaf. What steps should be taken to get maximum life from the pipes?	**07**
Q.7	**(a)**	Define: i. Extraction by stowing ii. Extraction by caving	**03**
	(b)	Write a note on timber supports used in coal mines.	**04**
	(c)	Write a note on: i. Roof bolting ii. Roof stitching.	**07**
Q.8	**(a)**	Define: i. Barrier ii. Headings	**03**
	(b)	Write a note on steel supports used in coal mines.	**04**
	(c)	Explain the mechanization used in longwall mining.	**07**