B.E. Mining Engineering Sixth Semester MN604 - Underground Metalliferous Mining

P. Pages: 2

# Time : Three Hours

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#### GUG/W/18/1720

Max. Marks: 80

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	Notes	: 1. 2. 3. 4. 5.	Due credit will be given to neatness and adequate dimensions. Assume suitable data wherever necessary. Diagrams and Chemical equation should be given wherever necessary. Illustrate your answers wherever necessary with the help of neat sketches. Weightage to the question indicated to its right.		
1.	a)	What is a 'Stope block'? Explain in brief how it is formed. State and discuss its various design considerations.			
	b)	Enlist ar below. - Na - Loo - Me - Pro - Sca - An	nd discuss any six u/g metal mines of our country furnishing details as outlined me of the Mine & company. cation, geology and ore mined. thods of stoping employed. oduction and OMS. de of mechanization. y other feature.	2x6 =12	
			OR		
2.	a)	Describe under, p	e in brief various procedures to be adopted to select appropriate stoping method articular set of geo-mining conditions.	2x5 =10	
	b)	Give a c	lassification of stoping methods based on support requirement.	2x3	
3.	a)	A 330m long & circular ore pass having cross sectional area of 6.15 sq.m. and inclined at 75° is to be driven in a pipe type of orebody. The time frame available is stipulated to 12 months. Assuming rest of the conditions, select and discuss in detail a suitable cost-effective method of drivage.		=6 12	
	b)	Draw a mine be	schematic showing flow of broken ore from stope to pit bottom in case of a shaft ing worked by square set stoping method.	4	
			OR		
4.		With ref - De - Sui - Ob - Sec - Cy	Terence to 'Winze' discuss the following in detail. finition. tability conditions. jective's quence of development and cle of operations in case of conventional drivage	16	

- Equipment's needed
- Manpower required.
- Merits and demerits.

A tabular steeply inclined gold vein that extends over 3200 m along the strike and is dipping at 75°. The orebody extends vertically from 30 m below surface up to a depth of 486m. The density of ore is 2.8 t/m<sup>3</sup>. The ore content is 15 gm of gold per tonne. The orebody width is about 1.1m. The HW and FW contacts are very regular and are a straight consisting of competent gneiss. The mine is to produce 3500 TPD.

Select suitable stoping method, justify your choice and explain in detail.

## OR

- 6. A low grade stockwork deposit having only  $0.065\% U_3O_8$  is about 20m thick and 150 m 16 long, dipping at 65°. The ground conditions are excellent. The waste and the ore are very hard and rocky. Assuming rest of the conditions, select suitable stoping method and discuss in brief.
- 7. A  $C_u$  Mo orebody occurring at a depth of 2140m is planned to be mined out for a daily 16 output of 1 Lakh tonnes. The orebody contains 1.75% Cu, 0.029% Mo and is 460 m high, 650m long and 180 m wide. Assuming rest of the conditions select suitable stoping method and discuss in detail. Justify your choice.

#### OR

8. Suggest and describe suitable stoping technique for following conditions; orebody – 4 km long, 80 m thick proven Reserves – 602 million tonnes Basic ores- Magnetite/ Apatite mix Grade – 48.5% Fe, 0.9% phosphorus HW – quartz porphyry and sedimentary rocks FW – Syenite porphyry Dip – 50° to 60° Depth – 2.0 Kms Production – 26 MTPA of ROM.

9. A carnallite (KCI. Mgcl<sub>2</sub>. 6H<sub>2</sub>O) deposit that is 70m thick and occurring at considerable 16 depth is to be worked by a economical and ecologically favorable mining method for carnallitic – brine production.

Assuming rest of the conditions, select suitable method and explain in brief giving all possible details.

### OR

1+2 =3

- **10.** a) What is 'Rock Burst'? Briefly explain its mechanism.
  - b) A roughly circular salt dome averaging about 1.5 to 3.0 kms in diameter and originating from a thick bed of salt as deep as 6 to 7.5 kms below the surface is to be worked out for mining of pure salt referred as 'halite' select suitable method and explain in brief giving away merits and demerits.

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