

Model Question Paper -1 with effect from 2020-21(CBCS Scheme)

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Fifth Semester B.E. Degree Examination SURFACE MINING

TIME: 03 Hours

Max. Marks: 100

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Module – 1			
Q.1	(a)	List the applicability, and the advantages and disadvantages of surface mining over underground mining.	5
	(b)	Estimate the number of blast hole drills required in a surface mining for the production of coal – 3 million te / year, coal seam thickness – 10 m,stripping ratio – 3 m ³ / te, dip of coal seam – 1 in 20. Assume other required data.	10
	(c)	Describe the bench parameters and their selection criteria in surface mines?	5
OR			
Q.2	(a)	Estimate the number of blast hole drills required for the production of iron ore – 5 million te / year, stripping ratio – 0.2 te / te, average in-situ density of ore – 3.8 te / m ³ , average in-situ density of waste – 2.8 te / m ³ .Assume other required data.	10
	(b)	Define a boxcutmethod usedin asurfaceMine? Discuss their objectives, types,and selection criteria for locating site for a box cut in surface mining.	5
	(c)	List the classification, applicability and the limitations of rippers used for bench material preparation in a surface mining operation.	5
Module – 2			
Q.3	(a)	Explain the general features and characteristics of electric shovel	5
	(b)	List the various classification of dumpers used in a surface mining operation.	5
	(c)	Draw a balancing diagram for simple side cast operation of a dragline and derive the expression, in terms of known parameters, for (i) height of spoil heap and for (ii) reach of the dragline. What is meant by MUF of a dragline and its significance?	10
OR			
Q.4	(a)	Explain the general features and characteristics of hydraulic shovel.	5
	(b)	Prepare a statement of heavy earth moving machinery required for a surface coal mine to be worked by shovel-dumper combination to produce 5.0 milliontonnes of coal per annum with an averagestripping ratio of 2.5 m ³ /tonne. The coal seam is 12 m thick and dips at 1 in 30. Average haul distance (one way) for both coal and overburden is 1km. (Assume any other data necessary and mention them).	10
	(c)	List the applicability and limitations of dumpers used in a surface mining operation.	5
Module – 3			
Q.5	(a)	With a neat sketch describe the principle of operation and working of a bucket wheel excavator used in a surface mining operation.	8

	(b)	Explain the methods of working using Continuous Surface Miner during various mining operation.	8
	(c)	List the advantages of HAC over traditional truck haulage system in open pit mine applications.	4
OR			
Q.6	(a)	Calculate the annual capacity of a bucket wheel excavator(operating in 3 shifts)having the following dimensions: (i)Wheel dia-6.2m (ii)number of buckets on the wheel-12 (iii) individual bucket capacity -380 lit (iv) cutting speed at the knife edge -2.6 m/sec (v) % swell of the material to be excavated -18 and (vi) fill factor -85% (vii)number of working days/year is 365 and (viii)utilization factor is 0.75.	10
	(b)	List the merits and demerits of belt conveyor systems over truck haulage system in a surface mine.	5
	(c)	List the advantages and disadvantages of Continuous Surface Minerin comparison to other types of excavators.	5
Module – 4			
Q.7	(a)	Explain the different types of In-pit Crushing System in surface mining operation.	10
	(b)	What are the different methods adopted for extraction of ‘primary blocks‘in mining of industrial/commercial granite? Describe any one of these methods indicating their merits and demerits.	10
OR			
Q.8	(a)	List the applicability and limitations of In-pit Crushing and conveying System	10
	(b)	Describe a suitable method adopted for extraction of ‘primary blocks‘in mining of industrial/commercial marbles? Describe any one of these methods indicating their merits and demerits.	10
Module – 5			
Q.9	(a)	Enumerate the factors influencing the stability of slopes in a surface mining.	5
	(b)	List the different types of highwall slopes in a surface mines.	5
	(c)	Describe the different modes of failures in highwall slopes in a surface mining.	10
OR			
Q.10	(a)	Describe the various slope stabilization and monitoring techniques in a surface mine.	10
	(b)	List the different types of mine slopes in a surface mines.	4
	(c)	Describe the various Slope stability assessment techniques in a surface mine operation.	6

Table showing the Bloom's Taxonomy Level, Course Outcome and Programme Outcome				
Question		Bloom's Taxonomy Level attached	Course Outcome	Programme Outcome
Q.1	(a)	1	1	7
	(b)	3	2	2
	(c)	1	1	7
Q.2	(a)	3	2	2
	(b)	1	1	7
	(c)	1	1	7
Q.3	(a)	1	2	5
	(b)	1	2	5
	(c)	2	3	2
Q.4	(a)	1	2	5
	(b)	2	2	5
	(c)	1	2	2
Q.5	(a)	1	3	5
	(b)	1	3	5
	(c)	1	3	5
Q.6	(a)	2	3	2
	(b)	2	3	5
	(c)	2	3	5
Q.7	(a)	1	3	5
	(b)	1	1	5
Q.8	(a)	1	3	5
	(b)	1	1	5
Q.9	(a)	1	4	3
	(b)	1	4	3
	(c)	1	4	3
Q.10	(a)	1	4	3
	(b)	1	4	3
	(c)	1	4	3
Bloom's Taxonomy Levels	Lower order thinking skills			
	Remembering(knowledge): L_1	Understanding Comprehension): L_2	Applying (Application): L_3	
	Higher order thinking skills			
	Analyzing (Analysis): L_4	Valuating (Evaluation): L_5	Creating (Synthesis): L_6	

