

Code No: R32261

R10

Set No. 1

III B.Tech II Semester Supplementary Examinations, April - 2018
MINE SYSTEMS ENGINEERING

(Mining Engineering)

Time: 3 hours
Max. Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

- 1 a) Use two-phase simplex method to [8M]
 Minimize $z = x_1 + x_2$
 Subject to the constraints:
 $2x_1 + x_2 \geq 4,$
 $x_1 + 7x_2 \geq 7,$
 $x_1, x_2 \geq 0$
- b) Explain about unbounded solution in Linear programming? [7M]
- 2 a) A work shop has four machines for assigning four jobs. Each job can be [8M]
 assigned to only one machine. Estimated processing cost in Rupees at each machine to complete each task is given in the table below:

Tasks	Machines			
	M1	M2	M3	M4
T1	61	92	52	72
T2	42	49	69	85
T3	47	59	80	71
T4	65	70	68	72

Calculate the minimum value of total processing cost based on an optimal assignment schedules?

- b) Explain about the methods of finding out initial basic feasible solution of a [7M]
 Transportation model?
- 3 a) A machine shop has four machines A, B, C and D. two jobs must be processed [8M]
 through each of these machines. The time (in hours) taken on each of the machines and the necessary sequence jobs through the shop are given below :

job 1	Sequence	A	B	C	D
	Time	2	4	5	1
job 2	Sequence	D	B	A	C
	Time	6	4	2	3

Use graphic method to obtain the total minimum elapsed time ?

- b) Write about the applications of replacement of items in Mining industry? [7M]

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- 4 a) Explain in detail about job shop sequencing with an example [8M]
b) Explain about the Minimax (maximin) criterion in Games theory? [7M]
- 5 In an open cast mine loading and transportation is carried out by shovel and dumper combination. There is one shovel in operation. Dumpers arrive at the rate of 10 dumpers per hour and it takes shovel on an average 5 minutes to load a dumper. Assume arrival is Poisson and Service time is exponentially distributed. Find out the [15M]
i. Proportion of time the shovel is busy
ii. Probability that the shovel is idle
iii. Expected number of dumpers in the system
iv. Expected number of dumpers in the Queue
v. Expected waiting time of the dumper in the Queue
vi. Expected idle time of a dumper in the system
- 6 a) Derive an expression for Economic Order Quantity (EOQ) assuming uniform daily receipts? [8M]
b) Explain about the Deterministic models of inventory management? [7M]
- 7 a) Explain any one application of dynamic programming with a relevant live example. [8M]
b) Explain about the Bellman's Principle of Optimality? [7M]
- 8 a) Explain about different types of Simulation models? [8M]
b) Explain about the characteristics of queuing system? [7M]

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