CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐ **15MN751**

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019

Mine System Engineering

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Define Mine System Engineering. Compare System Analysis and System Engineering. **(06 Marks)**

b. Explain Decision making choices under the situation of uncertainty. **(10 Marks)**

OR

2 a. Explain the following :
(i) Solution space (ii) Basic feasible solution
(iii) Optimal solution (iv) Redundancy **(04 Marks)**

b. Solve the following LPP graphically:

Maximize $Z = 20x_1 + 10x_2$

Subjected to $x_1 + 2x_2 \le 40$

$3x_1 + x_2 \le 20$

$2x_1 + 2x_2 \le 30$

$x_1, x_2 \ge 0$ **(12 Marks)**

Module-2

3 a. Explain the procedure for Big-M method. **(04 Marks)**

b. Use dual simplex method to solve the following LPP :

Minimize $Z = 5x_1 + 6x_2$

Subjected to $x_1 + x_2 \ge 2$

$4x_1 + x_2 \ge 4$

$x_1, x_2 \ge 0$ **(12 Marks)**

OR

4 a. Write a brief note on simulation technique for mining equipment selection. **(06 Marks)**

b. Explain the deterministic model for inventory. **(10 Marks)**

Module-3

5 a. A leading firm has 3 auditors, each auditor can work upto 160 hrs during the next month during which time three projects must be completed. Project 1 will take 130 hrs, Project 2 will take 140 hrs and Project 3 will take 160 hrs. The amount per hour that can be billed for assigning each auditor to each project is given in table 5(a) Formulate this as a transportation problem and find optimal solution. Also find the maximum total billing during the next month. **(12 Marks)**

Auditor	Project		
	1 (Rs.)	2 (Rs.)	3 (Rs.)
1	1200	1500	1900
2	1400	1300	1200
3	1600	1400	1500

Table 5(a)

b. Explain the steps in Penalty method (Transportation Problem). **(04 Marks)**

OR

6 a. Solve the following assignment problem, if it is treated as a salesman problem and the cell entries of Table 6(a) represent cost in rupees. Find the least cost route such that salesman does not visit any city twice. **(08 Marks)**

	A	B	C	D	E
A	-	2	5	7	1
B	6	-	3	8	2
C	8	7	-	4	7
D	12	4	6	-	5
E	1	3	2	8	-

Table 6(a)

b. Determine (i) Optimal Job assignment (ii) The cost of assignment for the problem in the table 6(b) **(08 Marks)**

	J_1	J_2	J_3	J_4	J_5
A	10	3	3	2	8
B	9	7	8	2	7
C	7	5	6	2	4
D	3	5	8	2	4
E	9	10	9	6	10

Table 6(b)

Module-4

7 a. Define the following terms:
(i) Network (ii) Activity (iii) Event (iv) Redundant Activity (v) Critical Path **(10 Marks)**

b. Draw a Network diagram for the set of activity given in Table 7(bi) and Table 7(bii)

Activity	A	B	C	D	E	F	G	H
Precedence	-	A	A	B	B, C	E	D, F	G

Table 7(bi)

Activity	A	B	C	D	E	F	G	H	I
Precedence	-	A	A	-	D	B, C, E	F	D	G, H

Table 7(bii) **(06 Marks)**

OR

8 A project consists of the following jobs and their duration given in Table 8

Activity	Precedence	Duration (in days)
A	-	10
B	A	9
C	A	6
D	B	7
E	B	5
F	C, D	9
G	E, F	8

Table 8

i. Draw a network diagram.
ii. Identify the critical path.
iii. Find the project duration.
iv. Calculate the floats - Total, Free, Independent & Interference.
v. Compute slack time for each event.

(16 Marks)

Module-5

9 a. Explain the characteristic of Queuing system. **(12 Marks)**

b. Classify the Queuing models. **(04 Marks)**

OR

10 a. Explain the following terms:

(i) Pay off matrix (ii) Strategy (iii) Zero sum game (iv) Saddle point.

(08 Marks)

b. In the following two Person Zero Sum game stable? Solve the game given in Table 10(b).

Prayer B

		I	II	III	IV
Prayer A	I	5	-10	9	0
	II	6	7	8	1
	III	8	7	15	1
	IV	3	4	-1	4

Table 10(b) **(08 Marks)**

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