Code No: **40330/30328**

MR14 – Regular & MR13-Supply

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.

IV B.TECH I SEMESTER REGULAR & SUPPLEMENTARY EXAMINATIONS, OCTOBER- 2017

SUBJECT: **OPERATIONS RESEARCH**

(BRANCH: **Common to ME & MINING**)

Time: **3 Hours** Max Marks: **75 Marks**

PART-A

I. Answer all the questions **5 x1=5M**

1. Define linear programming problem.
2. Distinguish between Individual replacement and group replacement policies.
3. Write the formula for determining waiting time in the queue in single server model
4. What is the value of shortage cost /unit if the shortages are not allowed in inventory models?
5. What is simulation?

II Answer all the questions **10 x 2=20M**

1. Differentiate between Degeneracy and non Degeneracy of transportation problem.
2. What do you mean by the two- phase method for solving a given L.P.P? Why is it used?
3. How replacement problems are classified?
4. Find the range of values p and q, of Table1which will render (2, 2) is a saddle point.

Table 1

		Player B		
		I	2	3
Player A	1	2	4	5
	2	10	7	q
	3	4	p	6

5. Write the elements of queuing systems.
6. Explain the single channel and multi-channel queueing models.
7. Describe the limitations of EOQ Formula.
8. What are the costs involved in Inventory control.
9. Explain the steps in Monte –Carlo simulation.
10. What is dynamic programming?

PART-B

Answer all the questions **5 x 10=50M**

1. A firm manufactures two types of products A and B and sells them at a profit of Rs. 2 on type A and Rs.3 on type B. Each product is processed on two machines G and H. Type A requires one minute of processing time on G and two minutes on H. Type B requires one minute on G and one minute on H. The machine G is available for not more than 6 Hours 40 minutes while machine H is available for 10 Hours during any working day. Solve the problem.

(OR)

2. Solve the following AP and find the optimal assignment Schedule.

	A	*B*	*C*	*D*	*E*
M_1	9	11	15	10	11
M_2	12	9	-	10	9
M_3	-	11	14	11	7
M_4	14	8	12	7	8

3. Use Johnson rule to determine the best sequence for six jobs given in Table4. Each job is processed in the order ACB

Table 4

Job	1	2	3	4	5	6
Machine A	12	8	7	11	10	5
Machine B	7	10	9	6	10	4
Machine C	3	4	2	5	1.5	4

(OR)

4. Find the optimal strategies for the games for which the payoff matrix for the player A is given in Table 4. Also find the value of game.

Table 4:

		Player B	
		I	II
Player A	1	1	3
	II	4	2

5. A branch of Punjab National Bank has only one typist. Since the typing work varies in length (number of pages to be typed). The typing rate is randomly distributed approximately a Poisson distribution with mean service rate of 8 letter per hours. The letters arrive at a rate of 5 per hour during the entire 8 hour workday. If the typewrite is value at Rs. 1.50 per hour, determine (a) equipment utilization (b) the % time as arriving letter has to wait (c) average system time (d) average idle time cost of the typewriter per day.

(OR)

6. People arrive at a theater ticket both in a poisson distribution annual rate of 50 per hour service time is constant at 90 seconds. Calculate
   a. The mean number in waiting time.
   b. The mean waiting time.

7. Find the optimum order quantity for a product for which the price breaks are as follows :

Quantity	**Unit cost (Rs.)**
$0 \leq Q_1 < 500$	10.00
$500 \leq Q_2$	9.25

The monthly demand for the product is 200 units, the cost of storage is 2% of the unit cost and the cost of ordering is Rs. 350.00.

(OR)

8. A particular item has a demand of 9000 unit per year. The unit cost of the item is Rs 100 and holding cost per unit is Rs 2.40 per year. The replacement is instantaneous and shortage cost is Rs 5 per unit per year. Determine
   (i) Total cost per year
   (ii) Economic Lot Size
   (iii) Number of order per year
   (iv) Time between two order
   If the cost of one unit is Rs1.

9. What are the advantages and limitations of using simulation?

(OR)

10. Use DPP method to

Minimize $Z = 3x_1+5x_2$.
Subject to
$x_1 \leq 4$,
$x_2 \leq 6$,
$3x_1 + 2x_2 \leq 18$
$x_1, x_2, \geq 0$.

Code No.: **307B1** | **MR 13**

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IV B.Tech I Sem Supplementary Examinations, NOVEMBER-2017

SUBJECT: **COMPUTER APPLICATIONS IN MINING**
(BRANCH: **MINING**)

Time: **3 Hours** Max Marks: 75

PART-A

I. Answer all the questions **5 x 1 = 5 M**

1. What are the uses of flow chart?
2. What is high wall?
3. Define simulation.
4. What is inverse transformation method?
5. What is SLAM?

II Answer all the questions **10 x 2 = 20 M**

1. What is the importance of computer programs in mining engineering?
2. Define block model.
3. Define variability and prediction.
4. What is pit angle?
5. What is breakdown?
6. How computer models help in deciding stope boundaries?
7. What is empirical method?
8. Define various properties of random numbers.
9. What is remote control?
10. Write differences between GPSS and SLAM.

PART-B

Answer all the questions **5 x 10 = 50 M**

1. Explain the applications of computers in the field of Mining.

(OR)

2. In what way, application of computers in mine design affects mine planning?

3. Write the procedure for designing the coal panel. Assume all other related data.

(OR)

4. What is production scheduling? Briefly explain gain of computerized production scheduling over conventional approach.

5. Write the simulation for optimization of the shovel dumper combination in opencast mine.

(OR)

6. Write the simulation for the subsidence above the Longwall panel.

7. a) Differentiate true and pseudo numbers
   b) Explain the properties of random numbers

(OR)

8. Write short notes on the following:
   a) Properties of random number b) Pseudorandom number

9. Draw logical flow diagram of surface mine activities.

(OR)

10. Write short notes on the followings:
    a) Simulation languages [6] b) Automatic control [4]

Code No.: 40722/30722

MR14 - Regular & MR13 - Supply

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IVB.TECH I SEMESTER REGULAR & SUPPLEMENTARY EXAMINATIONS, NOVEMBER - 2017

SUBJECT: **MINE LEGISLATION**

(BRANCH: **Mining**)

Time: **3 Hours** **Max Marks:75**

PART-A

I. Answer all the questions **5 x1=5M**

1. What is the provision for drinking water in underground mines?
2. What do you understand the word 'Compensation'?
3. In which year, the Coal Mines (Nationalization) Act was enacted in India?
4. List out different occupational diseases.
5. How safety consciousness can be created among the miners?

II Answer all the questions **10 x 2=20M**

1. What is "gassy seam of second degree"?
2. What are the shot firer's tools?
3. Which of the components of a main cable satisfy the statutory requirement of earthing and what shall be the conductivity of this component?
4. List out different permits required as per MMDR act
5. Who are the persons to be trained as per MVT rules?
6. What is the permitted explosive quantity during solid blasting in degree I,II and III gassy mines?
7. List out occupational health diseases as per act.
8. Define reportable and minor accident.
9. What is the application and purpose of Code of practice on safety and health in underground coalmines?
10. What is meant by safety consciousness?

PART-B

Answer all the questions **5 x 10=50M**

1. What are the duties and responsibilities of manager as per Coal Mines Regulations, 1957?

(OR)

2. Briefly explain the words illegal mining, competent persons, owner and reportable injury.
3. Write the general provisions of Workmen compensation act 1923.

(OR)

4. What are the provisions for "Mine development" as per The Mines and Minerals (Development and Regulation) Act, 1957?
5. What are the provisions for "general vocational training" and "refresher training" as per Mines vocational training rules, 1966?

(OR)

6. Explain the salient features of initial and refresher training as per MVT rules.
7. Briefly describe the duties and responsibilities of workmen's inspector.

(OR)

8. What are the occupational diseases in mining? Briefly explain them.
9. What are the different audio-visual aids that are used for safety compaign? Explain.

(OR)

10. What are the three main approaches to industrial relations and explain them?

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IV B.TECH I SEMESTER REGULAR & SUPPLEMENTARY EXAMINATIONS, OCTOBER- 2017

SUBJECT: **ROCK MECHANICS**

(BRANCH: **Mining**)

Time: **3 Hours** Max Marks: 75

PART-A

I. Answer all the questions **5 x 1 = 5 Marks**

1. Define rock mechanics.
2. What is stress?
3. What are the different types of subsidence?
4. What is trough?
5. What is finite difference method?

II. Answer all the questions **10 x 2 = 20 Marks**

1. What is meant by hardness of rock?
2. What is meant by creep?
3. What are the different types of supports used in underground?
4. How the value of cohesion is obtained from Mohr's envelope?
5. What is vertical subsidence theory?
6. What is angle of draw?
7. What is Overall slope angle?
8. What is circular failure?
9. Write any FOUR application of FEM in mining?
10. What are the different continuum methods?

PART-B

Answer all the questions **5 x 10 = 50 Marks**

1. What are the physico mechanical properties of rock?

(OR)

2. Explain about time dependent properties of rock.

3. Explain factors to be considered for design of supports in Long wall mining?

(OR)

4. What are the factors to be considered for design of supports in B & P workings? Explain each, with suitable examples.

5. What is meant by angle of draw? How can you control the mine subsidence? Explain with neat diagram.

(OR)

6. What are the causes of subsidence? Explain them with suitable examples?

7. What are the different slope stability methods? Explain.

(OR)

8. Explain different types of slope failures with the help of suitable diagrams?

9. Write the following i. FEM ii. Pascal triangle.

(OR)

10. Explain the difference between FEM and FDM?