

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 SUPPLEMENTARY EXAMINATIONS, APRIL-2018**SUBJECT: STRATA CONTROL TECHNOLOGY**

(BRANCH: MINING)

Time: 3 hours

Max. Marks: 75

PART – A**I. Answer All Questions**

5x1Mark=5 Marks

1. What is RMR?
2. What is Air Blast?
3. What is prop density?
4. What is a Hydraulic Load Cell?
5. State the objective of strata control cell?

II. Answer All Questions

10x2Mark=20 Marks

1. How to calculate the rock load in slices by CMRI- RMR?
2. What are different types of classification of rock masses? Briefly explain about one?
3. What are the consequences of Airblast?
4. Differentiate between Rock Bursts and Rock bumps?
5. What are the objectives of SSR?
6. Mention the supports that are used during development operations in underground coal mines?
7. List out different strata control techniques in coal mines.
8. Comment on usage of convergence meter in coal mines?
9. Explain the importance of strata control cell in mines?
10. Who should be the members of strata control cell?

PART-B**Answer All Questions**

5x10 Marks= 50Marks

1. What are the different kinds of strata control problems in coal mines? Explain how are you going to control such problems to make sure safety in mines?
OR
2. Write a note on RQD and how it is significant in geo mechanical studies?
3. How to assess the risk from hazards of overriding of pillars in coal mines?
OR
4. What are the suitable conditions for Main falls? What are the steps you need to take for getting main falls at regular intervals?
5. In a Bord and Pillar method of working having gallery width, height and thickness are 4.2 m, 3 m and 3.6 m respectively. What will be number of roof bolts if carrying capacity of bolt is 3 tonne. Assume other conditions
OR
6. What are the factors to be considered for design a support system for fully mechanized longwall? Explain them in detail.
7. Describe various approaches for development of strata control techniques in mines.
OR
8. Explain briefly different instruments used for stress measurement.
9. Why it is required to keep strata Control in mines? Explain?
OR
10. What is strata control cell organisation? Explain its role regarding to strata control technologies?

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IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, APRIL-2018Branch: **MINING**Subject: **Rock Fragmentation Engineering**

Time: 3 hours

Max. Marks: 75

PART – A**I. Answer All Questions****5x1Mark=5 Marks**

1. What do you understand by drilling rate and penetration rate?
2. What is burden?
3. What are the blasting accessories used in surface mines?
4. What is perimeter blasting?
5. What is Frag List?

II. Answer All Questions**10x2Mark=20 Marks**

1. What are the different drilling methods?
2. What is bore hole economics?
3. What are blasting theories?
4. List the properties of explosive.
5. List out the different initiation systems.
6. List out the causes of misfires.
7. Why ground vibrations are generated after blasting?
8. What is the difference between primer and booster?
9. What is the purpose of high speed video camera during blasting?
10. What is bore hole pressure transducer?

PART-B**Answer All Questions****5x10 Marks= 50Marks**

1. What are the drilling principles? Draw neat labelled sketch of a drilling machine and briefly explain its working principle.

OR**2. Write short notes on the followings**

- a) Mechanics of rotary drilling
 - b) Cutting parameters of a pick
3. What do you know about hydraulic and pneumatic methods of rock fragmentation? Explain

OR**4. Data pertaining to a surface bench blast is given below:**

Burden = 3.0 m, Spacing = 4.0 m, Bench height = 10.0 m, Density of rock = 2000 kg/m³, Subgrade drilling = 1.0 m, Collar Stemming = 4.0 m, Air Decking = 1.0 m, Linear charge concentration = 10 kg/m. Calculate powder factor in the blast in Kg/tonne.

5. What are the factors that influence selection of explosives in mines?

OR

6. What is fly rock in blasting? What are the main causes of fly rock? Briefly discuss the various methods to reduce fly rock.

7. Write in detail with neat sketch about surface mine blast planning.

OR

8. Why blasting induced ground vibrations are dangerous? Explain it with a case study

9. Discuss the working principle of VOD measurement probe with neat diagram.

OR

10. Describe the instrumentation in blasting. How it affects the performance of blasting?

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IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, APRIL-2018**SUBJECT: ROCK MECHANICS****(BRANCH: Mining)****Time: 3 Hours****Max Marks: 75****PART-A****I. Answer all the questions****5 x 1 = 5 Marks**

1. What is strength?
2. Define poisson's ratio.
3. What is a Sink hole?
4. Define rock burst.
5. What is meant by FEM?

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

1. What information can be drawn from mechanical properties of rock?
2. What are Poisson number and ratio?
3. What is brittle fracture?
4. What are different theories of rock failure?
5. What are the different subsidence prediction methods?
6. What is NEW?
7. What is the principle of photo elastic models?
8. What are the principles of photo elastic models?
9. What is the difference between FEM & FDM?
10. What is a continuous model?

PART-B**Answer all the questions****5 x 10 = 50 Marks**

1. Discuss RMR classification mechanism. What are its application and limitations?

(OR)

2. What are Poisson's ratio and Young's modulus? Describe the procedure for determination of them.
3. Explain about Mohr-coulomb's failure criterion?

(OR)

4. Explain, with a suitable diagram, Mohr's theory of rock failure?
5. Explain different methods of prediction and prevention of subsidence.

(OR)

6. What are different factors influencing subsidence?
7. Write various techniques for stabilizing the opencast dump.

(OR)

8. Write the assessment methods of rock burst and coal bump proneness.
9. What are the applications of Numerical methods in Mining Engineering?

(OR)

10. What is meant by FEM? What are the different FEM methods? Explain.

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IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, APRIL-2018**SUBJECT: MINERAL PROCESSING****(BRANCH: Mining)****Time: 3 Hours****Max Marks:75****PART-A****I. Answer all the questions****5 x 1 = 5M**

1. Define the term ore dressing.
2. Write down the factors affecting settling of particles?
3. What is direct floatation?
4. What are limitations of electrical separator?
5. What are the minerals responding to magnetic separation process?

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

1. List the scope of Mineral Processing.
2. Differentiate between ball mill and rod mill.
3. What is Hydro Cyclone?
4. What is the free settling ratio?
5. What are the effects of reagent feeds?
6. Write down the purpose of frothers in flotation process?
7. Explain about Belt-type electrostatic separator?
8. What are the applications of dielectric separation methods?
9. Write a short note on magnetic precipitators?
10. List the limitations of Magnetic separator?

PART-B**Answer all the questions****5 x 10=50M**

1. Write the working principle of Jaw crusher with neat sketch.

(OR)

2. List out different types of grinding operations with brief note. What are the Process requirements in wet & dry grinding?

3. Explain in brief 'Dense Media Separation'. Describe different media employed for the operation with examples.

(OR)

4. Briefly explain about Harz Jig with neat sketch?

5. Explain the working of fagergren flotation cell with neat sketch.

(OR)

6. Explain the working of Denver flotation cell with neat sketch?

7. What is Electrical Separation? Explain with diagram Roll-type electrostatic Separator in brief?

(OR)

8. With a neat sketch explain briefly about High Tension Separator?

9. What are the different types of wet magnetic separators? Briefly explain about them.

(OR)

10. List different types of industrial magnetic separators? Explain with diagram belt type wet magnetic separator and its operation?

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IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, APRIL-2018**SUBJECT: MINE LEGISLATION**

(BRANCH: **Mining**)

Time: **3 Hours**

Max Marks:75

PART-A**I. Answer all the questions**

5 x1=5M

1. Define Mine as per Mines act.
2. Write the objective of workmen compensation act.
3. What do you mean by explosive according to explosive act, 1884?
4. What do you mean by serious bodily injury?
5. Which skills are required by the employee in top level management?

II Answer all the questions

10 x 2=20M

1. Write any three functions of committee as per act.
2. What is "gassy seam of second degree"?
3. List precautions to be taken during electrical signalling.
4. What is an open cast working as per MCDR, 1988?
5. Write the importance of vocational training in mines.
6. Name any four purposes of Payment of Wages Act?
7. Write the contents to be mentioned in an accident report.
8. Write the functions of pit safety committee.
9. What is the application and purpose of Code of practice on safety and health in surface mines?
10. What is the role of management in industrial relations?

PART-B**Answer all the questions**

5 x 10=50M

1. What are the functions and powers of inspector of mines as per Mines act, 1952?
(OR)
2. What are the provisions for "first-aid rooms" and "first-aid stations" as per The Mines Rules, 1955?
3. List various provisions of Indian electricity rules applicable for underground coal mine?
(OR)
4. What are the conditions of a prospecting licence?
5. What is the importance of Environment Protection act? Explain the requirement of such an act in present scenario.
(OR)
6. Write the general provisions of Environmental protection act.
7. What are the provisions for "facilities to be provided for occupational health survey" as per The Mines Act, 1952?
(OR)
8. What do you think the causes of accidents in mines? Suggest preventive measures to avoid accident in mines.
9. Discuss on Publicity, audio-visual aids and safety drive campaigns for development of consciousness in mines?
(OR)
10. Write a note on role of international labour organization and its model code in safety.

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1. Define Operation Research?
2. What are the conditions used to solve n jobs three machines problem by using Johnson algorithm?
3. Give any two applications of Queuing theory.
4. Define Economic Order Quantity.
5. What is backward recursive approach in dynamic programming?

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

1. Write a short note on degeneracy in transportation problems.
2. Explain duality in linear programming.
3. List out different types of sequencing models.
4. Explain the principal assumptions made while dealing with sequencing problems.
5. What is Steady state system in queuing models?
6. Write basic elements of queueing model.
7. What are Advantages of under stocking?
8. A particular item has demand of 9000units per year. The cost of procurement is Rs. 100 and the Holding cost per unit is Rs. 2.40 per year. The replacement is instantaneous and no shortages are allowed. Determine the economic lot size.
9. What are the applications of dynamic programming?
10. Write short note on simulation languages.

PART-B**Answer all the questions****5 x 10=50M**

1. Use the two-phase simplex method to

$$\text{Maximize } Z = 5x_1 - 4x_2 + 3x_3$$

Subject to

$$2x_1 + x_2 - 6x_3 = 20$$

$$6x_1 + 5x_2 + 10x_3 = 76$$

$$8x_1 - 3x_2 + 6x_3 = 50$$

$$x_1, x_2, x_3 \geq 0$$

(OR)

2. Find the optimal solution to the following Transportation problem.

Centers**Factories**

	P	Q	R	S	Availability
A	10	8	7	12	500
B	12	13	6	10	500
C	8	10	12	14	900
Demand	700	550	450	300	

3. A factory has a large number of bulbs all of which must be in working condition. The mortality of bulbs is given in the following table:

Week	1	2	3	4	5	6
Proportion of bulbs failing during the week	0.1	0.15	0.25	0.35	0.12	0.03

If a bulb fails in service, it costs 3.50 to replace but if all bulbs are replaced at a time it costs Rs.1.20 each. Find the optimal group replacement policy.

(Assume 1000 bulbs are available in the beginning).

(OR)

4. Find the sequence that minimizes the total elapsed time (in hours) required to complete on the following two machines.

Task	A	B	C	D	E	F	G
Machine I	2	5	4	9	6	2	7
Machine II	6	8	7	4	3	9	3

5. The capacity of yard is to admit of 9 trains. 30 trains/hour are received on average in the yard. Service rate is 40Trains/hour. Determine

- The probability that the yard is empty
- Average queue length

(OR)

6. At a one-man barber shop, customers arrive according to the Poisson distribution with a mean arrival rate of 4 per hour and his hair cutting time was exponentially distributed with an average hair-cut taking 12 minutes. There is no restriction in queue length. Calculate the following :

- Expected time in minutes that a customer has to spend in the queue.
- Fluctuations of the queue length.
- Probability that there is at least 5 customers in the system.

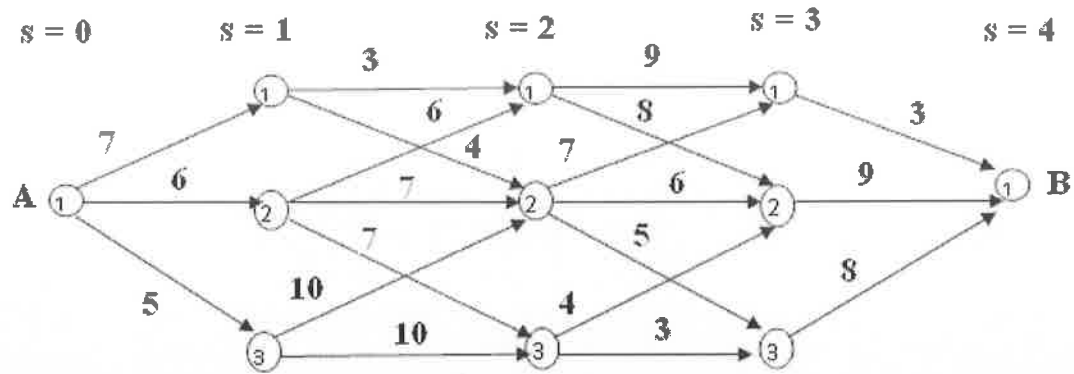
Percentage of time the barber is idle in 8-hr. day.

7. Find the most economic batch quantity of a product on a machine of the production rate of the item on the machine is 300 pieces/day and the demand is uniform at the rate of 150 pieces/day. The set-up cost is Rs.300 per batch and the cost of holding one item in inventory is Rs.0.81 per day. How will the batch quantity vary if the machine production rate was infinite?

(OR)

8. A commodity is to be supplied at a constant rate of 200 units per day. Supplies of any amount can be had at any required time, but each ordering costs Rs.50: costs of holding the commodity in inventory is Rs.2.00 per unit per day while the delay in the supply of the items includes a penalty of Rs.10 per unit per day. Find the optimal policy (Q, t) , where 't' is the reorder cycle period and Q is the inventory level after reorder. Also find the optimal inventory level and shortage units. What would be the best policy if the penalty cost becomes infinity?

9. Find the shortest path from vertex A to vertex B along arcs joining various vertices lying between A and B as shown in the figure. Length of the path is given below.



(OR)

10. Use DPP method to

$$\text{Minimize } Z = 3x_1 + 5x_2.$$

Subject to

$$x_1 \leq 4,$$

$$x_2 \leq 6,$$

$$3x_1 + 2x_2 \leq 18$$

$$x_1, x_2 \geq 0.$$

