

**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Maisammaguda, Dhulapally, (Post Via Kompally), Secunderabad-500 100.

**II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, NOVEMBER-2018**

Subject: Extraction of Mineral Deposits

(BRANCH: **MINING**)

Time: **3 Hours**

Max Marks:75

**PART-A**

**I. Answer all the questions**

**5 x 1=5M**

1. Define the term "Mining"?
2. What is an Explosive?
3. What are the materials used for Supports?
4. What are the modes of entry into underground to access the mineral deposits?
5. Define "Silicatisation"?

**II Answer all the questions**

**10 x 2=20M**

1. Differentiate underground and opencast Mining.
2. Describe briefly the importance of mining for national economy.
3. Explain any one high explosive briefly.
4. What are the applications of drilling in Mining?
5. What are the objectives & Limitations of supports?
6. Differentiate between setting load and yield load
7. What are the factors to be considered for selection of site for shafts.
8. What are the differences between cyclic and continuous system of mining?
9. What is the principle of freezing method of shaft Sinking?
10. What are the limitations of modern methods of shaft Sinking?

**PART-B**

**Answer all the questions**

**5 x 10=50M**

1. Explain the distribution & Status of mining of the following mineral/metal deposits.  
a) Coal      b) Iron      c) Copper      d) Gold      e) Limestone      [5×2=10]  
[OR]
2. What are the stages in life of a mine. Explain them briefly. [10]
3. What are the properties to be considered while selecting an explosive and explain their characteristics. [10]  
[OR]
4. What are the methods of drilling available in mining? Explain them briefly along with their limits & uses. [10]
5. What is the principle of Roof Bolt? Explain different types of roof bolts used in underground and their applications along with sketch. [10]  
[OR]
6. Describe the procedure of clearing up the heavy roof fall occurred at a junction by using systematic supporting. [10]
7. Explain the cycle of operations to be followed during driving a drift of 2.4×3.8m size. [10]  
[OR]
8. Explain the cycle of operations to be followed during sinking of a shaft of 6.2m diameter [10]
9. Explain the method of shaft sinking if the ground strata contains joints, fractures, cavities etc. [10]  
[OR]
10. Write briefly about  
a) Widening & deepening of shaft  
b) Modern methods of shaft sinking.

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(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)  
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

**II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, NOVEMBER-2018**Subject: **MECHANICS OF FLUIDS AND HYDRAULIC MACHINES**Branch: **MINING**Time: **3 hours**Max. Marks: **75****PART – A****I. Answer ALL questions of the following****5x1Mark=5 Marks**

1. Define specific weight.
2. Define streak line.
3. Write Bernoulli's equation.
4. Define lift.
5. List types of compressors.

**II. Answer ALL questions of the following****10x2Mark=20 Marks**

1. Draw the variation of shear stress with velocity gradient for Newtonian and non-Newtonian fluids. .
2. Differentiate steady and unsteady flows.
3. Describe the velocity distribution in fully developed flow in circular pipe with neat sketch.
4. Describe the working principle of reaction turbine.
5. What is meant by discharge in reciprocating pumps?
6. Define Reynolds number and write the equation.
7. Differentiate between displacement thickness and moment thickness.
8. Write the equation for velocity distribution for steady laminar flow through a circular tube.
9. What is meant by cavitation?
10. Write the equation for discharge through Venturimeter.

**PART-B****Answer ALL questions of the following****5x10 Marks= 50Marks**

1. A U-tube manometer containing mercury has its right limb open to atmosphere. The left limb is full of water and is connected to a pipe containing water under pressure, the center of which is in level with the free surface of mercury. Find the pressure of water in the pipe above atmosphere, if the difference of level of mercury in the limbs is 5cm.

(OR)

2. a) State the advantages of pressure gauges over manometers.  
 b) A certain liquid has a viscosity of 0.05 poise and specific gravity of 0.9. Compute the kinematic viscosity of the liquid in stokes and also in  $\text{m}^2/\text{s}$ .
3. (a) Derive Bernoulli's equation.  
 (b) Define and distinguish between: 1) uniform and non-uniform flows 2) compressible and incompressible flows

(OR)

- 4.(a) An incompressible fluid flows steadily through two pipes of diameter 0.2m and 0.3m which combine to discharge in a pipe of 0.4m diameter. If the average velocities in the 0.2m and 0.3m diameter pipes are 5m/s and 8m/s respectively, then find the average velocity in the 0.4m diameter pipe.  
 (b) Define and distinguish between stream line and path line.

5. (a) Two reservoirs are connected by a pipe 2250m long and 0.225m in diameter, the difference in water levels being 7.5m. Determine flow through pipe in liters per minute if  $f=0.03$ .  
 (b) Explain the characteristics of laminar and turbulent boundary layer.

(OR)

6. (a) What are the factors affecting boundary layer thickness?  
 (b) Two reservoirs are connected by three pipes laid in parallel, their diameters are  $d$ ,  $2d$  and  $3d$  respectively, and they are of the same length  $L$ . Assuming friction factor  $f$  to be the same for all pipes, determine discharge through each of the large pipes if the smallest pipe discharge is 2 cumsec.
7. A double jet Pelton wheel is required to generate 7000kW when the available head at the base of the nozzle is 450m. The jet is deflected through  $165^\circ$  and the relative velocity of the jet is reduced by 15% in passing over the buckets. Determine (i) the diameter of each jet (ii) total flow in  $\text{m}^3/\text{s}$  and (iii) force exerted by the jet on buckets in tangential direction. Assume generator efficiency of 95%, overall efficiency of 80%,  $K_v = 0.96$  and  $K_u = 0.45$ .

(OR)

8. A reaction turbine works under a head of 6m. The guide blades are inclined at  $30^\circ$  to the tangent at periphery and the runner vanes make  $110^\circ$  to the forward tangent at the periphery at inlet. If the discharge is radial and if all the exit velocity is wasted, find the hydraulic efficiency of the turbine. Assume velocity of flow to be constant. Find also the velocity of flow.
9. A double acting reciprocating pump has a bore of 150mm and stroke of 300mm. The suction pipe has a diameter of 100mm and is fitted with an air vessel. Find the rate of flow into or from the air vessel when the crank makes angles of  $30^\circ$ ,  $90^\circ$ , and  $120^\circ$  with inner dead center. The speed is 120 rpm and the plunger has simple harmonic motion.

(OR)

10. a) Explain the working principle of reciprocating pump with neat sketches.  
 b) What are the different efficiencies of a centrifugal pump?

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**II B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, NOVEMBER-2018**Subject: **PROBABILITY & STATISTICS**Branch: **Common to ME, CSE, IT & MINING**

Time: 3 hours

Max. Marks: 75

**PART – A****I. Answer ALL questions of the following****5x1Mark=5 Marks**

1. Define discrete and continuous random variable.
2. Define correlation coefficients.
3. Write the finite population correction factor.
4. Define Poisson distribution
5. Write conditions for periodic matrix.

**II. Answer ALL questions of the following****10x2Mark=20 Marks**

1. If X is a random variable, and A and B are constants, then prove that  $E(AX+B) = A E(X)+B$ , where E(X) is expected value of X.
2. What are the conditions under which Poisson distribution is a limiting case of Binomial Distribution
3. What do you mean by Correlation between two random variables?
4. Discuss briefly the Bernoulli's distribution.
5. Define Type-I and Type-II errors.
6. State central limit theorem.
7. Write the relations between  $L_q$ ,  $L_s$ ,  $W_q$ , and  $W_s$  in  $(M/M/1) : (\infty/\text{FIFO})$  model.
8. Write some applications of queuing theory
9. Suppose that the probability of a dry day (state 0) follows a rain day (state 1) is  $1/3$  and probability of a rain day follows a rain day is  $1/2$ . Find out the two state Markov chain and transition probability matrix.
10. Test the matrix  $\begin{bmatrix} 1 & 0 \\ \frac{1}{2} & \frac{1}{2} \end{bmatrix}$  is stochastic or not.

**PART-B****Answer ALL questions of the following****5x10 Marks= 50Marks**

1. In a normal distribution 31% of the items are under 45 and 8% are over 64. Find the mean and variance of the distribution.

**OR**

2. The probability that a bomb dropped from a plane will strike the target is  $1/5$ . If six bombs are dropped, find the probability that (i) exactly two will strike the target (ii) at least two will strike the target.

3. In a partially destroyed laboratory record, only the lines of regression of  $y$  on  $x$  and  $x$  on  $y$  are available as  $4x-5y+33=0$  and  $20x-9y=107$  respectively. Calculate  $\bar{x}$ ,  $\bar{y}$  and the coefficient of correlation between  $x$  and  $y$ .

OR

4. Given bi-variate data

x	1	5	3	2	1	1	7	3
y	6	1	0	0	1	2	1	5

- a) Find the regression line  $y$  on  $x$  and hence predict  $y$  when  $x=10$ .  
 b) Find the regression line  $x$  on  $y$  and hence predict  $y$  when  $y=2.5$ .
5. ON the basis of their total scores, 200 candidates of a Civil service examination are divided into two groups, the upper 30% and the remaining 70%. Consider the first question of the examination. Among the first group, 40 had the correct answer, where as among the second group, 80 had the correct answer. On the basis of these results, can one conclude that the first question is not good at discriminating ability of the type being examined here?

OR

6. The following table gives the number of aircraft accidents that occurred during the various days of the week. Find whether the accidents are uniformly distributed over the week

Day	SUN	MON	TUE	WED	THU	FRI	SAT	TOTAL
No. of accidents	14	16	8	12	11	9	14	84

7. At a certain petrol pump, customers arrive in a Poisson process with an average time of five minutes between arrivals. The time intervals between serves at the petrol pump follows exponential distribution and the mean time taken to service a unit is two minutes . Find the following: a) Average time a customer has to wait in the queue. b) By how much time the flow of the customers be increases to justify the opening of another service point, where the customer has to wait for five minutes for the service.

OR

8. Consider a single server queueing system with poisson input and exponential service time. Suppose the mean arrival rate is 3 calling units per hour with the expected service time as 0.25 hours and the maximum possible number of calling units in the system is 2. Obtain the steady state probability distribution of the number of calling units in the system and then calculate the expected number in the system.
9. a) Write classification of stochastic process.  
 b) Define irreducible and ergodic matrix.

OR

10. a) Check whether the following markov chain is ergodic and regular.

[8M]

$$\text{i) } P = \begin{bmatrix} 0 & \frac{1}{2} & \frac{1}{2} & 0 \\ \frac{1}{2} & 0 & 0 & \frac{1}{2} \\ \frac{1}{2} & 0 & 0 & \frac{1}{2} \\ 0 & \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{bmatrix}$$

$$\text{ii) } P = \begin{bmatrix} 0 & \frac{1}{2} & \frac{1}{2} & 0 \\ \frac{1}{2} & 0 & 0 & \frac{1}{2} \\ \frac{1}{2} & 0 & 0 & \frac{1}{2} \\ 0 & \frac{1}{2} & \frac{1}{2} & 0 \end{bmatrix}$$

- b) Define regular stochastic matrix and give an example.

[2M]