Code No.: 70B04 | MR17

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019

Subject: **PROBABILITY & STATISTICS**

Branch: **COMMON TO CE,ME,MINING,CSE&IT**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2M=10 M**

1. What are the properties of a good measure of central tendency?
2. Define Dependent and Independent events.
3. Write conditions for probability mass function (pmf).
4. Explain the terms type I and type II errors.
5. Explain Chi-square test of independence of attributes.

PART-B

Answer ALL questions of the following **5x10 M= 50M**

1. A)Find geometric mean from the following data.

Annual sales	0-10	10-20	20-30	30-40	40-50
frequency	4	20	35	10	6

B) Estimate the median.

Class	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79
Frequency	8	32	142	216	240	206	143	13

OR

2. For the two frequency distributions given in the adjoining table, the mean calculated from the first was 25.4 and that from the second was 32.5, Find the values of x and y.

Class	Distribution I frequency	Distribution II frequency
10-20	20	4
20-30	15	8
30-40	10	4
40-50	X	2x
50-60	Y	y

3. A) Two marbles are drawn in succession from a box containing 10 red, 30 white, 20 blue and 15 orange marbles, with replacement being made after each draw. Find the probability i) both are white ii) first is red and second is white.

B) A business man goes to hotels X, Y and Z, 20% , 50% and 30 % of the time respectively. It is known that 5 %, 4 % and 8 % of the rooms in X,Y and Z hotels have faulty plumbings. What is the probability that the business man's room having faulty plumbing is assigned to hotel Z.

OR

4. **a)** It is known that the population of a certain city is 45% female and 55% male. Suppose that 70% of the males and 10% of the females smoke. Find the probability that a smoker is male.

b) The probability that a teacher will give surprise test during any class meeting is 3/5. If a student is absent on two days, what is the probability that he will miss at least one test?

5. A random variable X has the following probability function:

X	0	1	2	3	4	5	6	7
P(x)	0	k	2k	2k	3k	K^2	$2k^2$	$7k^2+K$

i) Determine k ii) evaluate P(x<6), P(x≥6), P(0<x<5) and P(0≤x≤4) iii) if P (x ≤ L)> ½, find minimum value of L iv) Determine the distribution function of X v) Mean vi) variance.

OR

6. A) Prove that the function

$$f_\theta(x) = \begin{cases} \theta^2 x \exp\{-\theta x\}, & \text{if } x > 0 \\ 0, & \text{otherwise} \end{cases}$$

defines a probability density function for $\theta > 0$.

B) The average temperature (T) during the summer in a particular geographic region is 80^0F with a standard deviation of 10^0F. Assuming that the temperature can be modelled by a normal distribution, what is its probability exceeding 100^0F?

7. A) The mean height of 50 male students who participated in sports is 68.2 inches with a S.D of 2.5. The mean height of 50 male students who have not participated in sports is 67.2 inches with S.D of 2.8. Test the hypothesis that the height of students who participated in sports is more than the students who have not participated in sports.

B) Find the 95 % confidence limits for the mean of a normality distributed population from which the following sample was taken 15, 17, 10, 18, 16, 9, 7, 11, 13, and 14.

OR

8. A) A sample of 400 items is taken from a population whose standard deviation is 10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. Also calculate 95% confidence interval for the population.

B) A die was thrown 9000 times and of these 3220 yielded a 3 or 4. Is this consistent with the hypothesis that the die was unbiased?

9. The life time of electric bulbs for a random sample of 10from a large consignment gave the following data.

Item:	1	2	3	4	5	6	7	8	9	10
Life in 1000 hrs:	1.2	4.6	3.9	4.1	5.2	3.8	3.9	4.3	4.44	5.6

Can we accept the hypothesis that the average life time of bulbs is 4000 hrs.

OR

10. The time taken by workers in performing a job by method **I** and method **II** is given below:

Method I	20	16	26	27	23	22	-
Method II	27	33	42	35	32	34	38

Do the data show that the variances of time distribution from population from which these samples are drawn do not differ siginificany?

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019

Subject: **MECHANICS OF SOLIDS**

Branch: **MINING**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2M=10 M**

1. What is elasticity and plasticity?
2. Explain the types of loads acting on a beam?
3. What is section modulus?
4. Establish a relation between torque polar moment of inertia and shear stress?
5. Write formula to calculate circumferential strain and longitudinal strain.

PART-B

Answer ALL questions of the following **5x10 M= 50M**

1. A tensile test was conducted on a mild steel bar. The following data was obtained from the test
   (i) Diameter of the steel bar = 3 cm
   (ii) Gauge length of the bar = 20cm
   (iii) Load at elastic limit = 250 kN
   (iv) Extension at a load of 150 kN = 0.21 mm
   (v) Maximum load = 380 kN
   (vi) Total extension = 60 mm
   (vii) Diameter of rod at failure = 2.25 cm

   Determine:
   (1) The Young's modulus
   (2) The stress at elastic limit
   (3) The percentage of elongation
   (4) The percentage decrease in area.

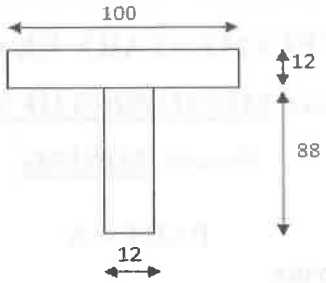
OR

2. A straight circular rod tapering from diameter 'D' at one end to a diameter 'd' at the other end is subjected to an axial load 'P'. Obtain an expression for the elongation of the rod.
3. A cantilever beam of 2 m long carries a uniformly distributed load of 1.5 kN/m over a length of 1.6 m from the free end. Draws shear force and bending moment diagrams for the beam.

OR

4. A simply supported beam of length 8 m rests on supports 5 m apart, the right hand end is overhanging by 2 m and the left hand end is overhanging by 1m. The beam carries a uniformly distributed load of 5 kN/m over the entire length. It also carries two point loads of 4 kN and 6 kN at each end of the beam. The load of 4 kN is at the extreme left of the beam. Whereas the load of 6 kN is at the extreme right of the beam. Draw S.F and B.M diagrams for the beam and find the points of contra flexure.

5. Find maximum shear stress across the depth of the beam with the following cross section. Take shear force as 800N.



OR

6. Draw shear stress distribution for the following cross sections. Also locate the points where stress is maximum.

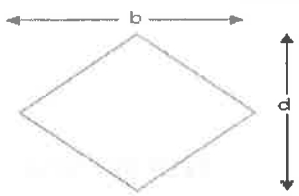


Fig a

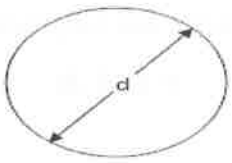


Fig b

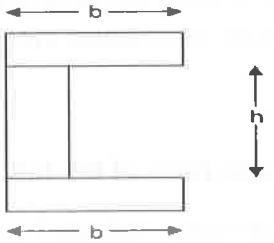


Fig c

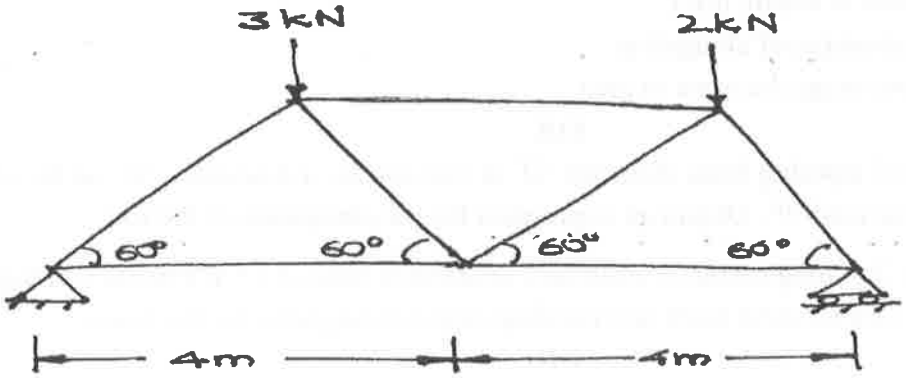
7. When a UDL of 'w' acts over the cantilever beam of span 'ℓ', find maximum deflection and slope.

OR

8. Find the expression for the slope and deflection of a cantilever of length L which carries a uniformly distributed load over a length 'a' from the fixed end by Double integration method.
9. What is the ratio of thickness to diameter in thin and thick pressure vessels. Why are radial stresses absent in thin pressure vessels?

OR

10. Find the forces in members by method of joints.



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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019

Subject: **DRILLING & BLASTING**

Branch: **MINING**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2M=10 M**

1. State the mechanics of drilling.
2. Explain solid blasting.
3. What are the advantages and limitations of NONEL blasting?
4. What are the special features of an explosives van?
5. Define peak particle velocity. Why it is important to study PPV?

PART-B

Answer ALL questions of the following **5x10 M= 50M**

1. Describe the mechanics of rock breakage by percussive drilling with neat sketches.

OR

2. What are the various types of drill bits adopted in extraction of bedded deposits? Explain the factors considered for selection of drill bits in those deposits.
3. Explain in brief about the following. (3+4+3)
   a) Slurry Explosives.
   b) PMS and SMS.
   c) Emulsion Explosives

OR

4. What is the bulk system of explosive? Explain what advantages it offers? How are the explosives amenable to bulk loading?
5. a) Explain electrical firing and non electrical firing.
   b) Explain Safety fuses, Detonating cord and Accessories.

OR

6. Explain the general safety measures are to be taken for blasting practices
7. a) Explain the procedure for establishing a magazine.
   b) Explain the salient points regarding the storage transportation, Mixing and charging of ANFO Explosives

OR

8. What may be the probable causes of accidents due to the explosives?
9. a) Explain the various environmental impacts of blasting operation.
   b) Enumerate the various causes of ground vibration produced form the blasting operation in a mine.

OR

10. Write brief nots about controlled blasting techniques. What is presplitting technique? How is it done? Elaborate about air decking technique.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019

Subject: **MINING MACHINERY-I**

Branch: **MINING**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2M=10 M**

1. What is rope? List various types of ropes used in mines?
2. What is tension pulley?
3. What are the limitations of diesel locomotives?
4. What is head? How this head is helpful in dewatering?
5. Discuss on distribution of electric power in mines.

PART-B

Answer ALL questions of the following **5x10 M= 50M**

1. What is rope splicing? Describe the method of rope splicing with neat diagram.

OR

2. a) What are different types of wire ropes used in mines?
   b) A turbine pump discharge 3500litre/min with a total head of 400m. If pump efficiency is 70%, motor efficiency is 90%, Calculate the Power required.
3. Discuss on care and maintenance of ropes.

OR

4. a) Direct rope haulage system is to be used in a drift mine 1000m long which dips at 1 in 4 against the load. An output of 700 tons per shift of 7 hours hauling time is to be obtained. The maximum speed of the haulage will be 15km/hour. Determine the number of trams per set required if the trams hold 2tonnes of coal.
   b) Explain the Endless rope haulage system with neat sketch.
5. A locomotive weighing 10 ton hauls a train of 50 ton down a gradient of 1 in 100 at a speed of 16 Km/hr. Brakes is applied on locomotive to bring the train to rest. Calculate (a) the gross braking effect. (b) the effective retarding force (c) the rate of retardation (d) the time taken to stop the train, and (e) the stopping distance. Assume a coefficient of dynamic friction of 0.16 and running resistance of 70 N per ton.

OR

6. a) Explain the constructional features and working principle of side discharge loader.
   b) What are the merits and demerits of side discharge loader?
7. What is high angle conveying? Explain the constructional details and working principle of a high angle conveyor, with a suitable diagram. What are it's advantages and disadvantages.

OR

8. a) What is an armoured face conveyor and state the latest innovation in its construction?
   b) In a belt conveyor drive the tension on the side is double that on the slack side. If the value of u is 0.3. Find the angle of lap required if the belt is not to slip on its driving drum.
9. What is mine cable? Distribute the power to depillaring panel from the surface.

OR

10. What are the difference between 'intrinsically safe' and 'FLP' electrical equipment? What are the circumstances under which these equipments are to be used in mines?

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019

Subject: **MINE SURVEYING-I**

Branch: **MINING**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2M=10 M**

1. What is survey?
2. What is leveling?
3. Draw the valley with contour.
4. What is traverse?
5. What is triangulation?

PART-B

Answer ALL questions of the following **5x10 M= 50M**

1. The following bearings are taken on a closed traverse

Line	FB	BB
AB	80°10′	259°
BC	120°20′	301°50′
CD	170°50′	350°50′
DE	230°10′	49°30′
EA	310°20′	130°15′

Compute the interior angles and correct them for observational errors. Assuming the observed bearing of the line CD to be correct adjust the bearing of the remaining sides.

OR

2. What is error? Discuss various types of errors.

3. In running fly levels from a BM of RL 183.215, the following reading was obtained:

BS 1.215 2.035 1.980 2.625

FS 0.965 3.830 0.980

From the last position of the instrument, five pegs at 20m interval are to be set out on a uniform rising gradient of 1 in 40; the first peg is to have a RL of 181.580. Work out the staff readings required for setting the tops of the pegs on the given gradient.

OR

4. What is rise and fall method? Find the gradient of a underground gallery with rise and fall method.

5. Explain briefly about direct contouring method.

OR

6. What is contour? Discuss the various terminology of contour.

7. In the traverse ABCDEA

Line	Length (m)	Bearing
AB	234	64°
BC	345	88°
CD	188	148°
DE	166	268°
EA	422	324°

Determine the closing error precision of traverse.

OR

8. Discuss the closed traverse using compass with a neat diagram.

9. What are the principles of triangulation survey? Determine area using compass and chain? What are the advantages and disadvantages of triangulation survey?

OR

10. Discuss the principles of triangulation survey with neat sketches.