

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, MAY-2019**Subject: Mechanics of Solids

Branch: MINING

Time: 3 hours

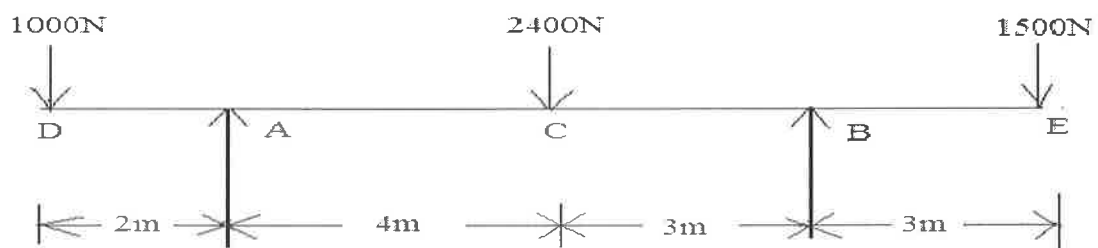
Max. Marks: 60

PART – AAnswer **ALL** questions of the following**5x2Marks=10 Marks**

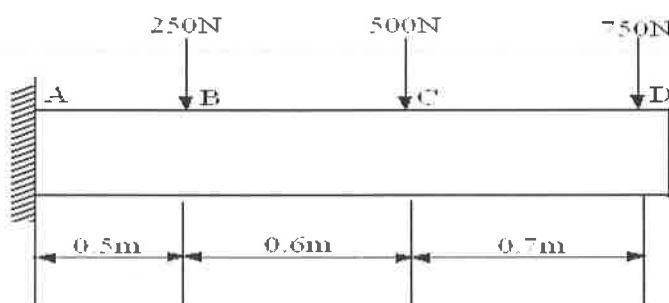
1. Define bulk modulus and modulus of rigidity.
2. Draw stress-strain curve for brittle material and explain.
3. Assumptions in the theory of simple bending
4. What are the assumptions made in deriving Torsion equation?
5. What is hoop stress and explain why hoop stress is required?

PART-BAnswer any **FIVE** Questions of the following**5x10 Marks= 50Marks**

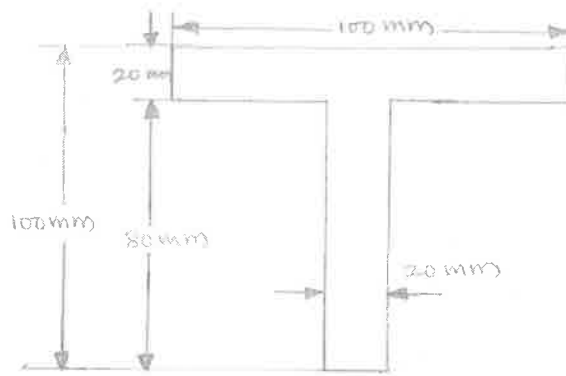
1. Write short notes on the following
 - a) i) Malleability ii) toughness.
 - b) i) plasticity ii) brittleness
2. a) Derive the equation for strain energy of a non prismatic bar and varying axial loads.
b) Strain energy and modulus of resilience.
3. Calculate the reactions at the supports A and B of the beam shown in Fig. Draw the B.M.D and S.F.D. Determine also the points of contra flexure within the span AB and show their positions on the bending moment diagram.



4. A cantilever beam of length 1.8 m carries the point loads as Shown in Figure Draw the S.F and B.M. diagrams for the cantilever beam.



5. A cast iron beam is of T- section as shown in Fig. The beam is simply supported on a span of 8m. The beam carries a uniformly distributed load of 1.5 kN/m length on the entire span. Determine the maximum tensile and maximum compressive stresses.



6. a) What are the design criteria according to the bending and relation between the bending moment and section modulus?
 b) A solid steel shaft has to transmit 75 kW at 200 r.p.m. Taking allowable shear stress as 70 N/mm², find suitable diameter for the shaft, if the maximum torque transmitted at each revolution exceeds the mean by 30%.
7. a) i) slenderness ratio ii) polar modulus
 b) i) St. Venant's principle ii) polar moment of inertia for hollow rectangular shaft.
8. a) A seamless pipe of 1.2m diameter is to carry fluid under a pressure of 1.6N/mm². Taking permissible stress in the metal as 100N/mm². Determine thickness of metal.
 b) A cylindrical vessel closed with plane ends is made of a 4mm thick steel plate. Its diameter is 250mm and length is 750mm. It is subjected to an internal fluid pressure of 300 N/cm². Calculate the longitudinal and hoop stresses in the shell plate. Also, calculate changes in diameter, length and volume of the cylinder. Take $E=210\text{GN/m}^2$ and poisson's ratio = 0.3

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GundlapochampALLY (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019**Subject: Probability & Statistics

Branch: Common to CE, ME, & MINING

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2Marks=10 Marks

1. Write mean and variance of Binomial Distribution
2. Define Bernouli Distribution
3. Define Null Hypothesis
4. Write any two properties of Chi-Square distribution
5. Define Karl Pearson's coefficient of correlation

PART-B

Answer any FIVE Questions of the following

5x10 Marks= 50Marks

1. a) State Boole's inequality.
b) A problem in statistics is given to three students A, B and C whose chances of solving it are $1/2$, $1/3$ and $1/4$ respectively. What is the probability that the problem will be solved?
2. Three machines produce 70%, 20% and 10% of the total number of a factory. The percentages of defective output of these machines are 4%, 3% and 2% respectively. An item is selected at random and found defective. Find the probabilities that it has been manufactured by machines I, II and III respectively.
3. a) A continuous random variable X has the distribution function.

$$F(x) = \begin{cases} 0, & \text{if } x \leq 1 \\ (x-1)^4, & \text{if } 1 \leq x \leq 3 \\ 1, & \text{if } x > 3 \end{cases}$$

Find (i) $f(X)$ (ii) $P(1 \leq X \leq 2)$

b) Fit a Poisson distribution to the following data.

X	0	1	2	3	4
f(X)	109	65	22	3	1

4. a) The diameter of an electric cable is assumed to be a continuous variate with p.d.f $f(x) = 6x(1-x)$ in $[0,1]$. Find the mean and variance of the variate.
b) The mean of a binomial distribution is 40 and s.d is 6. Find n,p,q
5. The mean lifetime of a sample of 100 light tubes produced by a company is found to be 1580 hours with standard deviation of 90 hours. Test the hypothesis that the mean lifetime of the tubes produced by the company is 1600 hours.
6. The means of two large samples of sizes 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as drawn from the same population of S.D 2.5 inches.
7. a) State student t-distribution and its properties.
b) A sample of 26 bulbs gives mean life of 990 hours with a standard deviation of 20 hours. The manufacturer claims that the mean life of bulbs is 1000 hours. Is the sample not upto the standard?
8. The Regression equations of two variables X and Y are $X = 0.7Y + 5.2$ and $Y = 0.3X + 2.8$
Find the means of the variables and the coefficient of Correlation between them.

