

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**Time: **3 hours**Max. Marks: **60****PART – A**Answer **ALL** questions of the following**5x2M=10 M**

1. Define Probability.
2. Define discrete and continuous random variables.
3. Define parameter and statistic.
4. Define t-test statistic.
5. Write the limits of the Correlation Coefficient.

PART-BAnswer **ANY FIVE** questions of the following**5x10 M= 50M**

1. a) Suppose that we have two events, A and B , with $P(A) = 0.50$, $P(B) = 0.60$, and $P(A \cap B) = 0.70$. Find $P(A/B)$ and verify whether A and B are independent.
b) State Bayes' theorem and explain a situation where this theorem can be applied.
2. A business man goes to hotels X , Y , Z 20%, 50%, 30% of the time respectively. It is known that 5%, 4%, 8% of the rooms in X , Y , Z hotels have faulty plumbing's. What is the probability that business man's room having faulty plumbing is assigned to hotel Z ?
3. a) Average number of accidents on any day on a national highway is 1.8 determine the probability that the number of accidents are (i) at least one (ii) at most one
b) Compute the value of k , mean and variance of the following probability distribution:

Value of X, x	-3	-2	0	1	2
$P(X=x)$	$2k$	$5k$	$4k$	k	$3k$

4. a) Calculate expectation and variance of X , if the probability distribution of the random variable X is given by

X	-1	0	1	2	3
Y	0.3	0.1	0.1	0.3	0.2

b) X is a discrete random variable prove that $E(X+Y)=E(X)+E(Y)$.

5. a) Suppose 5% of the components produced by a machine were defective. After overhauling of the machine, 12 components were observed to be defective in a random sample of 400 components. Has the machine improved?

b) A random sample of size 81 was taken whose variance is 20.25 and mean is 32, construct 95% confidence interval.

6. A set of five similar coins is tossed 320 times and the result is as follows

No. of heads:	0	1	2	3	4	5
Frequency	6	27	72	112	71	32

Using the Chi-Square test of goodness of fit, Test the hypothesis that the data follows a Binomial Distribution.

7. In a test given to two groups of students drawn from two normal population marks obtained were as follows,

Group A : 18, 20, 36, 50, 49, 36, 34, 49, 41.

Group B : 29, 28, 26, 35, 30, 44, 46.

Examine the equality of variances at 5% level of significance.

8. Subhishi Store is a small local grocery store with only one checkout counter. Assume that shoppers arrive at the checkout lane according to a Poisson probability distribution, with an arrival rate of 15 customers per hour. The checkout service times follow an exponential probability distribution, with a service rate of 20 customers per hour. Compute:

- What is the probability that no customers are in the system?
- What is the average number of customers that will be waiting for service?
- What is the average time a customer will spend waiting for service?
- What is the average number of customers in the system?
- What is the average time a customer will spend in the system?

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019Subject: **ENGINEERING GEOLOGY**Branch: **CE****Time: 3 hours****Max. Marks: 60****PART – A****Answer ALL questions of the following****5x2M=10 M**

1. What is the Importance of Structural Geology?
2. What is the Importance of study of minerals?
3. Differentiate the terms Magma and Lava?
4. Write about lining of tunnels?
5. What is Richter scale?

PART-B**Answer ANY FIVE questions of the following****5x10 M= 50M**

1. a) Write the importance Geology from Civil Engineering point of view.
b) What are advantages of study of minerals by physical properties?
2. Explain various stages of river development.
3. Compare the physical properties, Chemical composition and uses of
 - a) Quartz and Feldspar
 - b) Muscovite mica and Biotite mica.
4. Describe the principles of geological methods.
5. a) Write about the Seismic Methods and their applications.
b) Explain in detail radiometric method.
6. Briefly describe the role of different geological considerations in the selection of a tunnel site.
7. a) What are the effects of landslides?
b) Explain the causes and effects of an earth- quake.
8. a) What are the causes and effects of Earthquakes?
b) What are measures to be taken to prevent the occurrence of Landslides?

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019Subject: **ADVANCED SOLID MECHANICS**

Branch: CE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2M=10 M

1. Write any two assumptions in Euler's theory.
2. Define the term Angle of repose with respect to retaining wall.
3. Distinguish between thin and thick cylinders.
4. Give any two examples where the unsymmetrical bending occurs.
5. Mention the importance of shear center in structural applications.

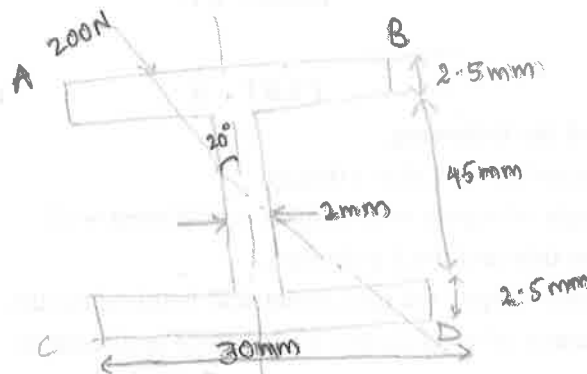
PART-B

Answer any FIVE questions of the following

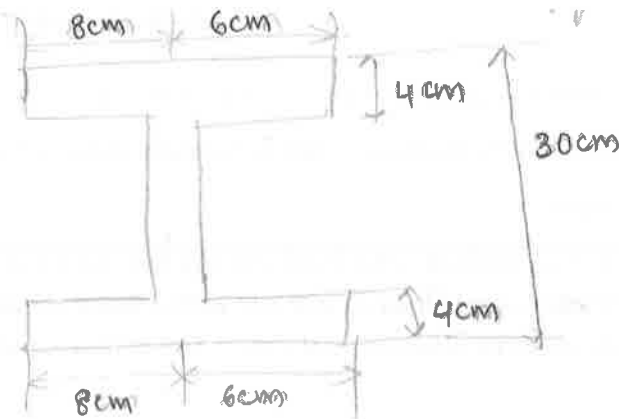
5x10 M= 50M

1. a) A hollow C.I column whose outside diameter is 200 mm has a thickness of 20mm. it is 4.5m long and is at both ends. Calculate the safe load by Rankine Gordon formula using a factor of safety of 4. Take: $\sigma_c = 550 \text{ MN/m}^2$, $a = 1/1600$.
b) A hollow cylindrical cast iron column 5m long with one end fixed one end free. Determine the minimum diameter of the column if it has to carry a safe load of 200 KN with a factor of safety of 5. Take the internal diameter as 0.8 times the external diameter. Take $\sigma_c = 550 \text{ N/mm}^2$ and $a = 1/1600$ in Rankine's formula.
2. a) Write about Prof. Perry's formula in columns and struts.
b) What is short, medium and long column?
3. a) A masonry dam of rectangular cross section 12m high and 5m wide has water upto top on its one side. If the density of masonry is 2300 kg/m^3 , find (i) Pressure force due to water per meter length of dam(ii) resultant force and the point at which it cuts the base of the dam.
b) A masonry trapezoidal dam of 5m high, 1m wide at its top and 3m wide at its bottom retains water on its vertical face. Determine the maximum and minimum stresses at the base when the reservoir is full.
4. a) What do you mean by middle third rule for rectangular section?
b) What are different conditions under which a dam is going to fail?
5. a) Derive the circumferential stress in thin spherical shells.
b) Find diameter of kernel of hollow circular section.

6. A Cantilever of I-section, 2.4 m long is subjected to a load of 200 N at the free end as shown in Figure. Determine the resulting bending stress at corners A and B, on the fixed section of the cantilevers.



7. Determine the position of the shear center of the section of a beam as shown in fig.



8. Locate the shear center of ISMC 400. The properties of ISMC 400 are $b_f = 100$ mm, $t_f = 15.3$ mm, $t_w = 8.6$ mm and $D = 400$ mm.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019Subject: **ENVIRONMENTAL SCIENCES**Branch: **COMMON TO CIVIL,ME**Time: **3 hours**Max. Marks: **60****PART – A**Answer **ALL** questions of the following**5x2M=10 M**

1. Discuss the significance of food chains food webs.
2. Differentiate between Renewable and non-renewable resources.
3. Differentiate between primary and secondary air pollutants.
4. Explain the important causes for ozone layer depletion.
5. Write a note on Clean Development Mechanism.

PART-BAnswer **ANY FIVE** questions of the following**5x10 M= 50M**

1. a) Discuss the different types of ecological pyramids.
b) Explain the concept of food chain and food web in ecosystems with help of examples.
2. a) Discuss about importance of Ecosystems.
b) Write a short note on forest eco-system.
3. a) Discuss the environmental impacts of major dams.
b) Write a short notes on hydroelectric energy.
4. a) Explain the reasons for exploitation of groundwater in urban areas and discuss various methods to control groundwater depletion in urban areas.
b) Explain the importance of biodiversity to the mankind.
5. a) Soil as sink for pollutants.
b) Soil degradation activities.
6. a) List the gases responsible for global warming. Explain the possible consequences of green house effect.
b) Discussing the importance of forests, explain the consequences of deforestation.
7. a) What is over-grazing? How does it contribute to environmental degradation?
b)Importance of international conventions.
8. a) Explain about Environmental ethics and environmental economics.
b) Explain the concept of sustainable development and environmental education.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019Subject: **CONCRETE TECHNOLOGY**

Branch: CE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2M=10 M

1. Explain the structure of hydrated cement.
2. Write short note on Bulking of sand.
3. Which test is suitable for measuring workability and factors effecting workability?
4. Explain the Relation between creep and time.
5. What is self-curing concrete?

PART-B

Answer ANY FIVE questions of the following

5x10 M= 50M

1. Explain wet process of manufacturing the cement with neat sketch.
2. a) How is consistency of cement paste measured? [6M]
b) Explain the effect of C3S on the properties of concrete. [4M]
3. Explain the Alkali-aggregate reaction and also the methods to control it.
4. a) Write about soundness of aggregate.
b) Write about Gap grading of aggregate.
5. Explain clearly about factors affecting workability of concrete.
6. a) Estimate the strength of concrete using gel-space ratio law at 28 days for 800 grams of cement with 0.45 w/c ratio on fully hydrated and 50% hydrated.
b) Explain the importance of water cement ratio and its effects.
7. Explain in detail about Ultra sonic pulse velocity method with a neat sketch.
8. Design M 35 grade concrete mix for the following data using BIS method:

CA: 16mm crushed granite

FA: River sand conforming to zone III

Workability: medium

Quality control: medium

Exposure: Moderate

Cement: OPC 53 grade

Specific gravity: cement: 2.99;

FA: 2.65; CA: 2.55

Water absorption by CA: 3 %

Free surface moisture in FA: 3%

Bulky of FA: 10% , Assume suitable data required.

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER-2019Subject: **HYDRAULICS AND HYDRAULIC MACHINERY**

Branch: CE

Time: 3 hours

Max. Marks: 60

PART – A

Answer ALL questions of the following

5x2M=10 M

1. Define Hydraulic Jump? Write down the uses of Hydraulic Jump
2. Perfect similitude is not possible in modeling a river? Justify.
3. Define specific speed of a centrifugal pump. What is its significance?
4. How the Pelton turbine is governed?
5. Define manometric head of centrifugal pump.

PART-B

Answer any FIVE questions of the following

5x10 M= 50M

1. a) Explain by specific energy diagram that for a given specific energy, there are two possible depths for a given discharge.
b) Water flows at $3.75 \text{ m}^3/\text{s}$ per meter width along a rectangular channel. The depth of flow at a certain section is 1.0 m. If a hydraulic jump occurs on the downstream, find the depth of flow after the jump.
2. Prove that for the trapezoidal channel of most economical section.
Half of top width = Length of one of the sloping sides.
Hydraulic mean depth = $\frac{1}{2}$ Depth of flow.
3. a) What are the characteristics of repeating variables?
b) The velocity and flow over a model of spillway are 2 m/s and $3 \text{ m}^3/\text{s}$ respectively. Find out the velocity and discharge over a prototype which is 30 times the model size.
4. a) Explain the significance of dimensional analysis.
b) Define Reynolds number, Froude number and Mach number and discuss their significance.
5. A 10 cm diameter water jet strikes a curved vane with a velocity 25 m/s. The inlet vane angle is 0° and outlet vane angle is 30° . determine resultant force exerted on vane when
 - i) vane is stationary
 - ii) vane moving with a velocity of 10 m/s in direction of jet

6. a) Explain in detail working of Kaplan turbine.
b) What are the differences between turbines and pumps and the components of hydraulic power plant.
7. a) Define Cavitation. What are the effects of Cavitation? Give necessary precautions against Cavitation
b) Write short notes on Model and Prototype?
8. a) Classify & explain efficiencies of turbines
b) Derive the expression for specific speed of turbines.