Code No.: **50109** | **MR15**

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 -2018

Subject: **Concrete Technology**

Branch: **CE**

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

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. Explain the chemical composition of cement.
2. Define the term "Alkali-Aggregate" reaction
3. Briefly explain maturity concept.
4. What is shrinkage and creep in concrete?
5. Explain about the durability of concrete.

PART-B

Answer any FIVE Questions of the following **5x 10 Marks= 50Marks**

1. What are the different types of admixtures? Explain briefly about Accelerates and Retarders
2. a) How is consistency of cement paste measured? **[6m]**
   b) Explain the effect of C3S on the properties of concrete. **[4m]**
3. a) Write about soundness of aggregate.
   b) Write about Gap grading of aggregate.
4. a) Explain any two Mechanical properties of aggregates.
   b) Write about Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate
5. a) Write about water curing and membrane curing.
   b) Explain different types of water curing.
6. Explain the following terms and classify them
   i) Batching
   ii) Mixing
   iii) Compaction
7. a) Write about shrinkage of concrete.
   b) Explain about relation between Compressive and Tensile strength.
8. a) Explain the role of light weight concretes in structures.
   b) What is no fines concrete? What are its advantages?

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER -2018

Subject: **ADVANCED SOLID MECHANICS**

Branch: **CE**

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

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. What are the types of column failure?
2. Define the term Angle of repose with respect to retaining wall.
3. State the assumptions made in Lame's theory.
4. Why won't we consider unsymmetrical structures for construction mostly?
5. Mention the importance of shear center in structural applications

PART-B

Answer any FIVE Questions of the following **5x 10 Marks= 50Marks**

1. a) What are the assumptions followed in Euler's equation? **(3M)**

   b) A 1.5 m long cast iron has a circular cross section of 50 mm diameter. One end of the column is fixed in direction and position and the other is free. Taking factor of safety as 3, calculate the safe load using Rankine-Gordan formula. Take yield stress as 560 MPa and constant α = 1/1600. **(7M)**

2. a) Write about empirical formula in columns and struts.

   b) Find Euler's crippling load for the column fixed at one ends and the other end is hinged.

3. A masonry dam of rectangular section 16m high and 8m wide , has water upto a height of 15m on its one side. Find: (i) Pressure force due to water on one metre length of the dam (ii) Position of centre of pressure, and (iii) the point at which the resultant cuts the base, Take density of masonry as 2000 kg/m^3

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. What do you mean by Lame's equations? How you derive these equations?

6. a) What do you mean by middle quarter rule for circular sections?

   b) Find diameter of kernel of hollow circular section

7. A beam of T-section (flange: 60 mm x 10 mm , web 100 mm x 5mm) is 3 m length and is simply supported at the ends. It carries a load of 4 kN inclined at 20^0 to the vertical and passing through centroid of section. If E= 200 GN/m2, calculate (i) Maximum tensile stress, (ii) Maximum compressive stress (iii) Maximum bending stress (iv) Deflection due to the load, δ (v) Position of neutral axis.

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.

Code No.: **50110**

MR15 - 2015-16 Batch

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER -2018

Subject: **Hydraulics and Hydraulic Machinery**

Branch: **CE**

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

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. What is M-curve? Give a few examples where M-curves exist.
2. What is Reynolds's law of similarity?
3. Draw velocity triangles at inlet and outlet tip when jet of water strikes tangentially at inlet tip on moving symmetrical curved blade.
4. A turbine has speed 200 rpm under a head of 80m.what will be the speed when head is 50m?
5. Draw operating characteristic curve indicating design head and design discharge for a pump.

PART-B

Answer any FIVE Questions of the following **5x 10 Marks= 50Marks**

1. a) Derive the necessary condition for most economical trapezoidal open channel, for the given side slopes.
   b) Derive the expression for loss of energy due to hydraulic jump.
2. a) Write a short note on Classification of GVF profiles.
   b) Derive the expression for critical depth.
3. a) Determine the dimensions of quantities given below
      i) Angular acceleration ii) Discharge iii) Force
      iv) Specific weight v) Dynamic viscosity.
   b) How are repeating variables selected in Dimensional Analysis?
4. a) The time period T of water surface waves depends on wave length L, depth of flow D, density of fluid ρ, acceleration due to gravity g and surface tension σ. Obtain functional relationship among variables using Π terms.
   b) A scale model of a car is tested n wind tunnel. The prototype velocity is 60 kmph.The drag on model is 250 N. Scale ratio is 1/6 .Determine drag and power in case of prototype. The air in model and prototype can assumed to have same properties.
5. a) Derive the equation for force exerted by a jet when jet strikes tangentially at one end of the unsymmetrical curved blade and the blade is fixed.
   b) A jet of liquid coming out of nozzle is 25 m/sec and it exerts a force of 4200 N on a fixed plate held normal to the jet. If the velocity of jet is increased to 40 m/sec, find the increase in force acting on the same plate.

6. a) A 10 cm diameter jet strikes a curved vane tangentially at 0^o and deflects by 60^o in horizontal plane. The velocity of jet is 20m/s and that of vane is 7m/s. Find force exerted by the jet and power extracted

   b) Derive the expression for force exerted by a jet on a stationary vertical plate in the direction of jet.

7. a) Explain Layout of hydro power plant.

   b) A reaction turbine works at 450 rpm under a head of 115m the diameter of inlet is1.2m and flow area is 0.4 m^2.At the inlet absolute velocity makes an angle 20^o and relative velocity vector makes 40^o With tangential velocity vector. Determine head and power extracted by turbine.

8. a) Explain operating characteristics curves of a pump.

   b) A centrifugal pump delivers water through a pipe of 10 cm diameter at the rate of 2 m^3/minute. The total height through which the water is lifted is 30 m. The frictional loss in the pipe is 10 m of water head. Find the power supplied by a motor to the pump if the overall efficiency of the pump is 70%.

Code No.: **50107** | **MR15 -**

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER -2018

Subject: **ENGINEERING GEOLOGY**

Branch: **CE**

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

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. Define weathering of rocks?
2. Describe the physical properties of Talc.
3. Sketch the rock cycle.
4. What is meant by Overbreak in tunnels?
5. What is the difference between Shield areas and Seismic belt areas?

PART-B

Answer any FIVE Questions of the following **5x 10 Marks= 50Marks**

1. a) What is Geology? What are its branches? **(6M)**

b) Distinguish Physical Geology, Petrology and Structural Geology. **(4M)**

2. a) Describe the importance of petrology and structural geology in civil engineering. **(4M)**

b) Briefly explain the chemical weathering of rocks. **(6M)**

3. Explain how do you identify the minerals using their physical properties?
4. Write a short note on the following with examples?

a) Moh's Scale of Hardness **(3M)**

b) Fracture and Luster **(3M)**

c) Explain about intrusive forms of igneous rocks **(4M)**

5. Write a short note on the following:

a) What is an Unconformity? Explain about different types of Unconformities with neat diagrams. **(6M)**

b) Briefly explain about Magnetic methods and their applications. **(4M)**

6. What is a fault.Discuss the various classifications of faults.
7. Briefly describe the role of different geological considerations in the selection of a tunnel site.
8. Describe the geological considerations in the site selection of a dam.

Code No.: 50H16 | MR15

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER -2018

Subject: **ENVIRONMENTAL SCIENCES**

Branch: **Common to CE & ME**

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

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. What are primary consumers? Give two examples.
2. Give two examples for alternative energy sources.
3. What is air pollution? Give any one cause for air pollution?
4. Define Kyoto Protocol?
5. Define population. Discuss major effects of population growth.

PART-B

Answer any FIVE Questions of the following **5x 10 Marks= 50Marks**

1. a) Discuss the models of energy flow in an eco system.
   b) What is the scope and importance of an ecosystem?
2. a) List the main components of an Ecosystem. And briefly describe the functions of each.
   b) Difference between Food chain & Food web?
3. Write a note on environmental effect of mineral extraction and their uses.
4. Explain genetic biodiversity, species diversity and eco system biodiversity.
5. a) Discuss various measures to control vehicular pollution.
   b) Discuss how solid waste can be managed by industries.
6. a) Write short note on how does soil pollution affect soil productivity?
   b) Explain the adverse effects of air pollution.
7. a) Explain Climate change and their impacts on human health?
   b) Which are the agents responsible for ozone depletion?
8. Explain the following
   a) Environmental ethics and environmental economics.
   b) Conservation of resources.

Code No.: **50B09** | **MR15**

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II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, DECEMBER -2018

Subject: **PROBABILITY & STATISTICS**

Branch: **Common to CE, ME & MINING**

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

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. Define Probability
2. Define discrete and continuous random variables
3. Define type I and type II errors
4. Define t-test statistic
5. Explain briefly the structure of a queuing system

PART-B

Answer any FIVE Questions of the following **5x 10 Marks= 50Marks**

1. 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.
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. X is continuous random variable with p.d.f given by

$$f(x) = \begin{cases} \frac{1}{8}(x+1), fr\ 2 < x < 4 \\ 0, otherwise \end{cases}$$

Then find E(X)?

4. X is continuous random variable with p.d.f given by $f(x) = kx^2e^{-x}$ when $x \geq 0$, find (i) k, (ii) Mean (iii) Variance.
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.
   c) What is the difference between point estimate and interval estimate?
6. a) Explain the general procedure of testing a hypothesis
   b) Define (i) population (ii) sample (iii) Estimation
7. The heights of six randomly chosen sailors are in inches :63,65,68,69,71and 72.Those of 10 randomly chosen soldiers are 61,62,65,66,69,70,71,72 and 73.Discuss ,the heights of these data throw on the suggestion that sailors are on the average taller than soldiers?
8. Find the regression lines of Y on X and X on Y for the following data

X	1	2	3	4	5
Y	2	5	3	8	7