Code No.: **50107** **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, MAY-2019

Subject: **Engineering Geology**

Branch: **CE**

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

**PART – A**

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. Define the terms Weathering and Erosion.
2. Write the definition of a mineral and mention the names of any two minerals.
3. Explain parts of fault with neat sketch.
4. What is Overbreak and Lining in Tunnels?
5. Explain the effects of earthquakes.

**PART-B**

Answer any **FIVE** Questions of the following **5x10 Marks= 50Marks**

1. a) Write the importance Geology from\Civil Engineering point of view.
   b) What are advantages of study of minerals by physical properties?
2. Compare the physical properties, Chemical composition and uses of
   a) Quartz and Feldspar b) Muscovite mica and Biotite mica.
3. a) Write about Folds, Faults, Unconformities and joints.
   b) How fold is differentiated from a fault? Explain briefly with a neat sketch.
4. Write a short on the following:
   a) Write about the effects of tunneling on the ground.
   b) Briefly explain about Arch dams and Earth dams.
5. a) What are the effects of landslides?
   b) Causes and effects of an earth- quake.
6. a) Explain the importance of weathering with reference to the dams and reservoirs. **(4m)**
   b) Write about the changes that occur in GRANITE rock due to weathering. **(6m)**
7. a) Describe about the Amygdaloidal Structure? **(5m)**
   b) Mention the physical properties of QUARTZ and ASBESTOS. **(5m)**
8. What is a Fault ? Explain the parts of fault in detail with a neat diagram? Write about the classification and types of Faults with neat sketches?

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## II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: **Concrete Technology**

Branch: **CE**

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

**PART – A**

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. Why accelerators are used in concrete?
2. Write short note on Bulking of sand.
3. What is meant by workability and factors effecting workability?
4. Explain the Relation between creep and time.
5. Write short note on Light weight concrete.

**PART-B**

Answer any **FIVE** Questions of the following **5x10 Marks= 50Marks**

1. a) What is Fly ash and how it effects the fresh and hardened properties of concrete?
   b) What is rice husk ash and how it effects the fresh and hardened properties of concrete?
2. Explain different types of Admixtures along with Properties.
3. a) What is the test for determination of aggregate crushing value and explain it?
   b) Briefly explain how Bulk density and Specific gravity of aggregates are found in laboratory
4. a) Estimate the strength of concrete using gel-space ratio law at 28days for 800grams 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?
5. a) Estimate the strength of concrete using gel-space ratio law at 28days for 500grams of cement with 0.5 w/c ratio on fully hydrated and 50 % hydrated.
   b) What are the measures should be considered while placing the concrete?
6. a) Describe the compression test to determine the compression strength of concrete
   b) Explain the different types of shrinkages of concrete
7. Write short notes on following
   i. Light weight aggregate concrete
   ii. High performance concrete
8. a) State the classification of aggregate and explain two of them.
   b) Explain about physical and chemical properties of aggregates

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## II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: **Hydraulics and Hydraulic Machinery**

Branch: **CE**

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

### PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. In most economical triangular section depth is 2m and discharge is $5m^3/s$. what is velocity?
2. Explain the terms geometrical, kinematic and dynamic similarities
3. Define specific speed of a centrifugal pump. What is its significance?
4. How are turbines classified? Explain
5. Define manometric head of centrifugal pump.

### PART-B

Answer any **FIVE** Questions of the following **5x10 Marks= 50Marks**

1. a) Derive the relationship for a maximum discharge through a circular open channel section.
   b) A trapezoidal channel has a side slope of 1 horizontal and 1.5 vertical and channel bed slope is 1 in 2000. The cross section area of the channel is 55 $m^2$. If the Chezy's constant is 60, determine the dimensions of the section, discharge for most economical section.
2. a) What are the various surface profiles that may occur? Explain in detail with sketches.
   b) Give conditions for most economical sections of open channel i) Rectangle Channel ii) Trapezoidal Channel iii) Circular Channel for Maximum Velocity and Maximum Discharge
3. a) State the Buckingham's $\pi$ Theorem.
   b) Obtain an expression for the drag force R on a partially submerged body moving with a relative velocity V in a fluid; the other variables being the linear dimension L , height of surface roughness K, fluid density $\rho$, and the gravitational acceleration g.
4. The efficiency $\eta$ of a fan depends on density $\rho$, viscosity $\mu$ of fluid, angular velocity $\omega$, diameter D and discharge Q. Obtain a functional relationship for $\eta$ in terms of dimensionless parameters.
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 jet of water having a velocity of 18 m/s strikes a curved vane which is moving with a velocity of 6 m/s. The vane is symmetrical and is so shaped that the jet is deflected through $120^0$. Find the angle of the jet at inlet of the vane so that there is no shock. What is the absolute velocity of the jet at outlet in magnitude and direction and the work done per unit weight of water? Assume the vane to be smooth.
7. a) Distinguish between Impulse and Reaction Turbines
   b) A Kaplan turbine develops 60,000 kW of power under a head of 25m with an overall efficiency of 90%. Taking the value of flow ratio = 0.5, speed ratio = 1.6, hub diameter as 0.35 times the diameter of runner, Find: i) diameter of the runner, ii) The speed of the turbine, iii) The specific speed of the turbine
8. a) Derive expression for minimum starting speed for a centrifugal pump.
   b) Load on hydal plant varies from 20 MW to 60 MW in 6 hrs then decreases to 30 MW in a day. The installed capacity are 110 MW. Determine load factor capacity factor and utilization factor.

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## II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: **Advanced Solid Mechanics**

Branch: **CE**

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

### PART – A

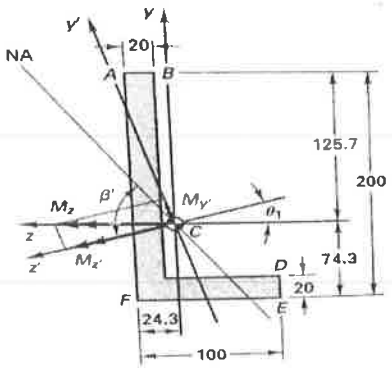
Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. Write any two limitations of Euler's theory.
2. What is the condition for no tension in the masonry of the dam at its base?
3. How can you reduce hoop stress in a thick cylinder?
4. Give any two examples where the unsymmetrical bending occurs.
5. How to locate neutral axis for beams curved in plan?

### PART-B

Answer any **FIVE** Questions of the following **5x10 Marks= 50Marks**

1. a) Write about Prof. Perry's formula in columns and struts.
   b) What is short, medium and long column?
2. Find the Euler's critical load for a cast iron hollow column of external diameter 200 mm diameter, 25 mm thick and of length 6 m hinged at both ends. E = 0.8 x 104 N/mm$^2$. Compare Euler's load with Rankine's critical load. Assume $f_c$ = 550 N/mm$^2$ and $\alpha$ = 1/1600. Find the length of column at which both critical loads are equal.
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 2300kg/m3 , 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) Explain how to find out the bending stress in unsymmetrical bending.
   b) Distinguish between active and passive earth pressure.
5. a) Derive the circumferential stress in thin spherical shells.
   b) Find diameter of kernel of hollow circular section.
6. a) A cylindrical shell is subjected to internal fluid pressure, find an expression for change in diameter and change in length of the cylinder.
   b) Derive the lame's equations.
7. Using the principal axes, determine the maximum tensile and compressive stresses caused by a bending moment of 10 kN-m acting around the horizontal axis for the angle shown in mm in figure below.




8. Locate the shear centre of symmetrical I section. The properties of I section are $b_f$ = 150 mm, $t_f$ = 16 mm, $t_w$ = 10 mm and d = 518 mm.

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

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## 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.

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

   Find (i) f(X) (ii) P (1≤X≤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.

Code No.: **50H16** **MR15**

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## II B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2019

Subject: **Environmental Sciences**

Branch: **Common to CE & ME**

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

### PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

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. What do you mean by urban sprawl? Explain.

### PART-B

Answer any **FIVE** Questions of the following **5x10 Marks= 50Marks**

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. Explain the coastal pollution due to sewage and marine disposal of industrial effluents?
7. 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.
8. a) Explain about Environmental ethics and environmental economics
   b) Explain the concept of sustainable development and environmental education