Code No.: **70102** | **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 I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **Fluid mechanics**

Branch: **CE**

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

PART – A

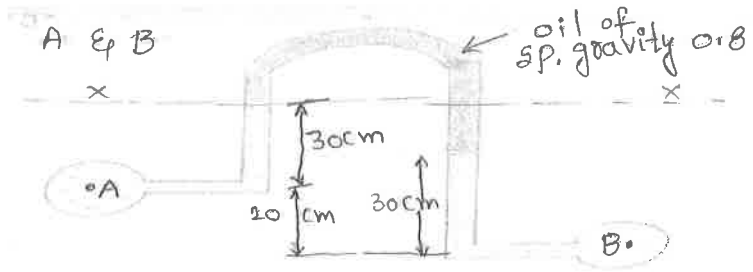
Answer ALL questions of the following **5x2Mark=10 Marks**

1. What is vapour pressure and explain with a neat sketch.
2. Define stream tube and streak line
3. What are the assumptions of Bernoulli's equation?
4. Define boundary layer with a neat sketch.
5. Write the classification of notches with neat sketches

PART-B

Answer ALL questions of the following **5x 10 Marks= 50Marks**

1. a) Describe a U tube manometer and derive an expression for the same (5)
   b) As shown in fig an inverted differential manometer is connected to two pipes A &B which convey water ,the fluid in manometer is oil or sp Gr 0.8 for the manometer reading shown in fig . Find the pressure difference between A & B .



OR

2. (a) Differentiate between Absolute pressure & Gauge pressure, manometer & mechanical gauges.
   (b) A soap bubble is formed when the inside pressure is 5 N/m^2 above atmospheric pressure. If the surface tension in soap bubble is 0.0125 N/m, find the diameter of the bubble formed.
3. a) Explain the terms: (i) Path line (ii) Streak line (iii) Stream line, (iv) Stream tube. (4)
   b) Water is flowing through a pipe having diameters 30 cm and 15 cm at the bottom and upper end respectively. The intensity of pressure at the bottom end is 29.43 N/cm^2 and the pressure at the upper end is 14.715 N/cm^2. Determine the difference in datum head if the rate of flow through pipe is 50 lit/s. (6)

OR

4. a) Water flows through a pipe AB 1.2 m dia at the rate of 3m/s and then passes through a pipe BC 1.5m dia . At C , the pipe branches, branch CD is 0.8m in dia and carries one-third of flow in AB. The flow velocity in branch CE is 2.5 m/s . Find the volume rate of flow in AB , the velocity in BC ,the velocity in CD and dia of CE.

   b).The stream function for a two dimensional flow is given by Ψ=2xy,calculate the velocity at the point P(2,3).find the velocity potential function φ

5. a) Water is flowing through a pipe of 5cm dia. under a pressure of 29.43N/cm2 (gauges) and with mean velocity of 2.0m/s. find the total head or total energy per unit weight of water at a cross-section ,which is 5m above the datum line . (4)

   b) Gasoline which has a vapour pressure of 5.5×10^4 Pa (abs) and density $\rho = 680$ kg/m^3 flows through a construction in a pipe where the diameter is reduced from 20 cm to 10 cm. The pressure in the 20 cm pipe just upstream of the construction is 50 kPa. If the atmospheric pressure is 75cm of mercury, calculate the maximum discharge that can be passed through this construction without cavitation occurring. (6)

OR

6. a) What are the practical application of Bernoulli's equation.

   b) A pipe line is carrying gasoline of specific gravity 0.75 changes in its diameter from 30 cm to 60 cm in a height of 6 m. The pressure at 30 cm to 60 cm diameters are 120 KPa and 60 KPa respectively. The discharge through the pipe is 0.3 m^3/Sec. Find the loss of head during the flow and direction of flow.

7. a) What is the physical significance of Reynold's number? (4)

   b) A lubricating oil of relative density 0.92 and dynamic viscosity 0.085 Pa. s is to be pumped at a rate of 40L/s with energy gradient in laminar flow not exceeding 0.04. Determine the least diameter of the pipe to satisfy the above requirement. (6)

OR

8. (a) Define drag and lift? Explain what causes the drag and lift? (4)

   (b) Oil flows through 100 mm diameter bore with a Reynolds number of 250. The dynamic viscosity of oil is 0.018 Pa-s and density is 900 kg/m^3. Determine pressure drop and head loss for 20 m length. (6)

9. a) Explain orifice meter in detail with diagram. Also derive an expression for finding out the actual discharge from a given orifice meter.

   b) A 150 mm x 75 mm Venturimeter with $C_d = 0.98$ is to be replaced by an orifice meter having a value of $C_d = 0.6$. If both the meters are to give the same differential mercury manometer reading for a discharge of 100 lps and the inlet dia. to remain 150 mm,what should be the diameter of orificemeter?

OR

10. a) Derive expression for discharge over a stepped notch.

    b). Find the discharge through a fully submerged orifice of width 2m if the difference of water levels on both sides of the orifice be 50cm. the height of water from top and bottom of the orifice are 2.5m and 2.75m respectively. Take C_d =0.6.

Code No.: **70105** | **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 I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **Engineering Geology**

Branch: **CE**

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

PART – A

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

1. What is "Erosion? What are the effects of it?
2. What is porphyritic and poikilitic texture.
3. Define Translation and Rotational faults.
4. What are the measures to be taken to control the silting problems in reservoirs?
5. What are Aquitard and Aquiclude?

PART-B

Answer ALL questions of the following **5x 10 Marks= 50Marks**

1. a) Explain the main and allied branches of civil engineering in detail.
   b) What is the importance of structural geology in civil engineering?

OR

2. Describe the importance of Geology in dams, reservoirs and tunnels
3. Write the physical properties of following minerals:
   a) Quartz b) Galena c) Graphite d) Asbestos e) Hematite

OR

4. Describe the various textures exhibited by Igneous rocks.
5. a) What is the necessity of geophysical investigations?
   b) Discuss the importance and advantages of geophysical investigations.

OR

6. Discuss the different methods of seismic investigation and instruments used.
7. What is the role of strike and dip associating with sedimentary rocks at dam site? Explain with suitable sketches.

OR

8. a) Write about economical aspects of tunneling.
   b) What is dam? Briefly explain different parts of dam with neat sketch.
9. a) Write short notes on "Cone of Depression".
   b) Write a short note on water logging.

OR

10. a) What are landslides? Enumerate the causes and effects of landslides.
    b) What are the measures to be taken to prevent landslides?

198

Code No.: **70103** **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 I SEMESTER REGULAR END EXAMINATIONS, DECEMBER-2018

Subject: **Surveying**

Branch: **CE**

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

PART – A

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

1. The distance AB on the ground as measured on plan drawn to a scale of 1cm = 50m was found to be 500m. Later it was detected that the surveyor wrongly used a scale of 1cm = 40 m in the calculations. Find the true length of the line AB.
2. Write any three advantages of Plane Table Survey.
3. What are the different types of tapes used for surveying?
4. Write the formula to apply corrections for curvature and refraction used in Levelling.
5. Write the general methods of determining the areas?

PART-B

Answer ALL questions of the following **5x 10 Marks= 50Marks**

1. (a) What are conventional symbols? Draw the symbol of a Bridge, a railway line, a bench mark.
   (b) Discuss the phases of Surveying.

OR

2. a) Write the different types of errors due to use of wrong scale?
   b) A Surveyor measured the distance between the two points on the plan drawn to a scale of 1cm = 40m and the result was 468m. Later however he discovered that he used a scale of 1cm = 20m. Find the true distance between the points?
3. Explain the Intersection method of Plane Table Surveying with the help of diagram.

OR

4. Discuss various equipment used in Plane Table Surveying.
5. a) Explain the 3-4-5 method with a neat sketch.
   b) Explain the indirect method of Ranging?

OR

6. **a)** What are the instruments used in chain surveying? How is chain surveying executed in the field?
   b) What are the different types of chains used for surveying?

7. Define contours on a map. Draw the contours of (a) Valley (b) Saddle (c) Overhanging Cliff (d) Contours with Landslide.

OR

8. a) Write the different types of leveling and explain the two methods for obtaining the elevations at different points?

b) Insert the missing entries and rebook by rise and fall method. Apply usual checks

BS	IS	FS	HI	RL	Remarks
X			279.080	277.650	OBM
	2.010			X	
	X			278.070	
3.370		0.400	X	278.680	
	2.980			X	
	1.410			280.640	
		X		281.370	TBM

9. a) Explain the procedure for determination of the capacity of reservoir?

b) An embankment of width 10 m and side slopes 1 ½:1 is required to be made on a ground which is level in a direction transverse to the centre line. The central heights at 40 m intervals are as follows: 0.90, 1.25, 2.15, 2.50, 1.85, 1.35, and 0.85. Calculate the volume of earth work according to i) Trapezoidal formula.

OR

10. a) A Railway embankment is 10m wide with side slopes 1 ½:1. Assuming the ground to be level in a direction transfers to the center line, calculate the volume contained in a length of 120m, the centre heights at 20m interval being in meters are 2.2, 3.7, 3.8, 4.0, 3.8, 2.8, 2.5.

b) A road embankment at the formation level is 6 m wide and has a side slope of 2:1. The road to have a constant R.L. of 200m, the ground was leveled across the center line of the road. The following observations were made:

Chainage (m)	0	20	40	60	80	100
Surface levels along c/l of road	204.6	203.0	200.8	201.6	202.0	200.2

Estimate the volume of earthwork

Code No.: **70104** **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 I SEMESTER REGULAR END EXAMINATIONS, DECEMBER-2018

Subject: **BUILDING MATERIALS CONSTRUCTION AND PLANNING**

Branch: **CE**

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

PART – A

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

1. List out the classification of rocks.
2. Write the composition of Ordinary Portland cement.
3. List out the steps involved in construction of an arch.
4. Explain briefly about Header and Stretcher.
5. Write about the Floor Space Index (FSI).

PART-B

Answer ALL questions of the following **5x 10 Marks= 50Marks**

1. a. Explain briefly about the precautions to be taken while doing blasting.
   b. Write a brief description about the composition of Brick earth.

(OR)

2. What are the constituents of good brick earth? Explain about the functions of its ingredients.
3. Explain in detail, the Dry process of manufacture of Ordinary Portland Cement?

(OR)

4. a. List out different types of cements. Explain the properties and uses of Ordinary Portland cement.
   b. Discuss in detail about the following: i. Accelerating admixtures ii. Retarding admixtures iii. Air-entraining admixtures iv. Super plasticizing admixtures
5. Explain in detail the operation involved in construction of concrete flooring.

(OR)

6. a. What are functional requirements of good ventilators?
   b. Briefly explain about the Sanitary fittings.
7. a. Explain types of Scaffolding with a neat sketch.
   b. Write about Ashlar masonry

(OR)

8. What do you understand by 'Composite masonry'? Enumerate various types of composite masonry and state the circumstances under which each type is used.
9. Write short notes on the following
   a) Green building Concept b) Green globes

(OR)

10. a) How do you achieve roominess and flexibility in a building? Explain with suitable examples.
    b) What do you understand by the principles of planning a building?

Code No.: **70101** **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 I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **Strength of Materials**

Branch: **CE**

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

PART – A

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

1. Define factor of safety.
2. What do you understand from uniformly varying loads
3. Define flexural rigidity and axial rigidity
4. What is double integration method explain.
5. Mention any two theories of failures for design of shafts?

PART-B

Answer ALL questions of the following **5x 10 Marks= 50Marks**

1. a) A 550mm long round bar of copper has a diameter of 30 mm over a length of 200 mm, diameter of 20 mm over a length of 200 mm and diameter of 10 mm over its remaining length. Determine the stresses in each section and elongation of rod when it is subjected to a pull of 30 kN. Assume E= 100kN/mm^2

   b) A steel rod is stretched between two rigid walls and carries a tensile load of 5000 N at 20°C. If the allowable stresses is not to exceed 130 MPa at -20°C, What is the minimum diameter of the rod? Assume $\alpha = 11.7 \times 10^{-6}$/°C and E=200 GPa.

OR

2. a) A solid bar of 30 mm diameter was subjected to tensile load of 54 kN and the measured extension on 300 mm gauge was 0.112 mm and change in diameter was 0.0036 mm. Calculate the Poisson's Ratio and three moduli. 8M

   b) State Hooke's Law 2M

3. a) A cantilever beam 1.5m long is loaded with a uniformly distribution load of 2 kN/m run over a length of 1.25m from the free end it also carries a point load of 3kn at a distance of 0.25m from the free end. Draw the shear force and bending moment diagram of the cantilever beam.

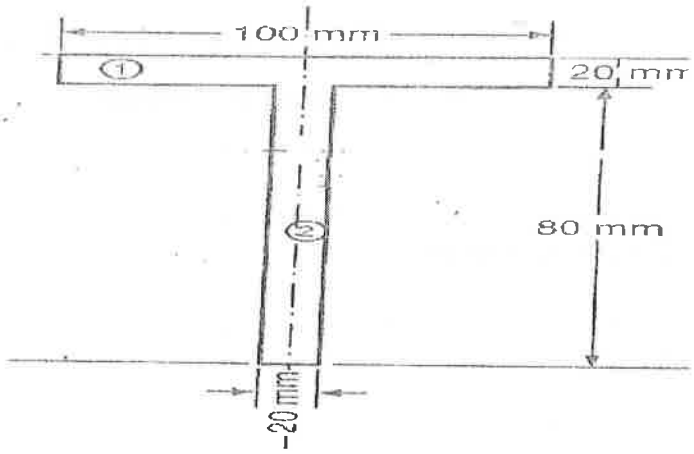
   b) Define hogging bending moment.

OR

4. a) A Simply supported beam 6 metre span carries udl of 20 KN/m for left half of span and two point loads of 25 KN end 35 KN at 4 m and 5 m from left support. Find maximum SF and BM and their location drawing SF and BM diagrams. 8M

   b) Define uniformly varying load. Write the formula for shear force and bending moment for simply supported beam carrying uniformly varying load throughout. 2M

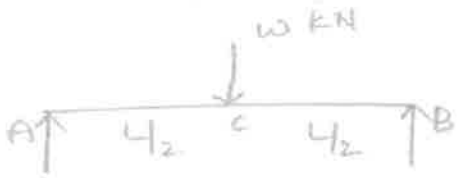
5. A cast iron beam is of T – Section as shown in figure, is simply supported on a span of 8 metre. The beam carries a uniformly distributed load of 1.5 kN/m through the entire span. Evaluate maximum compressive and tensile stresses.



OR

6. a) A square beam 20mmx20mm in section and 2m long is supported at the ends. The beam fails when a point load of 400N is applied at the centre of the beam. What UDL/m length will break the cantilever of same material 40mm wide, 60mm deep and 3m long.
   b) Explain the simple bending theory

7. a) Derive the expression for the deflection of a simply supported beam carrying uniformly distributed load 'w' over the entire span 'L' by double integration method.
   b) find the slopes at each end and deflection at centre by using Macaulay's method



OR

8. A cantilever beam AB of 4m carries point loads of 20 kN in free end and 30 kN at 2m from the free end. If E = $1x10^5$N/mm^2 and I = 1.5 $x10^8$ mm^4, Determine the slope and deflection of the cantilever at free end by moment area method.
9. A steel shaft is subjected to an end thrust producing a stress of 90 MPa and maximum shear stress on surface arising tension is 60 MPa. The yield point of simple tension is found to be 300 MPa. Calculate the factor of safety of the shaft with
   i. Maximum shear stress theory
   ii. Maximum shear strain theory
   iii. Maximum shear stress strain theory

OR

10. At a point in a beam the bending stress is 80N/mm^2 .The greatest principal stress is to be limited to 90 N/mm^2. What is the greatest shearing stress that can be applied on the given planes? Determine the minimum principal stress and its direction.

Code No.: **70B03** | **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 I SEMESTER REGULAR END EXAMINATIONS, NOVEMBER-2018

Subject: **Advanced Calculus**

Branch: **Common to CE, ME, EEE, ECE, CSE, IT**

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

PART – A

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

1. Obtain the Taylor series expansion of e^x about x = -1
2. Evaluate $\int_0^1\int_0^y xye^{-x^2}dxdy$
3. Find a unit normal to the surface $xy^3z^2 = 4$ at the point $(-1,-1,2)$
4. Evaluate $\int_0^1[ti + (t^2 - 2t)j + (3t^2 + 3t^3)k]\,dt$
5. Write the auxiliary equations of Charpit's Method

PART-B

Answer ALL questions of the following **5x 10 Marks= 50Marks**

1. a) Determine the functions $u = xy + yz + zx,\ v = x^2 + y^2 + z^2$ *and* $w = x + y + z$ are functionally dependent or not? If so find the relation between them.

   b) Find the extreme values of the function $f(x,y) = x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$

OR

2. Verify Rolles theorem for f(x) = $x^{2m-1}(a-x)^{2n}$ in [0, a] where a>0.

3. a) Evaluate $\int_0^1\int_0^{1-x}\int_0^{1-x-y} dz\,dy\,dx$

   b) Using spherical polar co-ordinates find the volume of the sphere $x^2 + y^2 + z^2 = a^2$

OR

4. Change the order of integration and evaluate $\int_0^b\int_{\frac{a}{b}}^{\sqrt{b^2-y^2}} xydxdy$

5. a) Find the directional derivative of $f = x^2 - y^2 + 2z^2$ at the point P(1,2,3) in the direction of the line PQ where Q is the point (5, 0, 4). Also calculate the magnitude of the maximum directional derivative.

   b) Find the constant a so that the vector field is solenoidal. $\vec{f} = (x+3y)\vec{i} + (y-2z)\vec{j} + (x-az)\vec{k}$

OR

6. Show that the vector field A = $(x^2 + xy^2)i + (y^2 + yx^2)j$ is irrotational, and find scalar potential Function

7. Prove that $\vec{f} = (4xy - 3x^2z^2)\vec{i} + 2x^2\vec{j} - 2x^3z\vec{k}$ is **a)** conservative field **b)** find the scalar potential of $\vec{f}$ **c)** find the work done in moving an object in this field from (0,0,0) to (1, 1, 1)

OR

8. Verify Greens theorem $in\ the\ xy - plane\ for \int_c e^x(\sin y\, dx + \cos y\, dy)$ where c is rectangle with vertices (0, 0), (1, 0), (1, π/2), (0, π/2)

9. (a) Form a partial differential equation by eliminating the arbitrary constants a, b from $(x-a)^2 + (y-b)^2 = r^2$

   (b) Solve $z^2(p^2 + q^2 + 1) = 1$

OR

10. (a) Form the partial differential equations by eliminating the arbitrary function $z = f(\sin x + \cos y)$.

    (b) Solve the partial differential equation $zpq = p+q$

Code No.: **70M03** | **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 I SEMESTER REGULAR END EXAMINATIONS, DECEMBER-2018

Subject: **Environmental Science**

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

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

PART – A

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

1. Define ecological pyramid? Mention the types of ecological pyramids.
2. Define Geothermal energy?
3. What is environmental pollution?
4. What is rating of green building?
5. How the environmental education helps for the sustainable environment?

PART-B

Answer ALL questions of the following **5x 10 Marks= 50Marks**

1. a) What are the biotic and abiotic components of an ecosystem?
   b) What are the functions of ecosystem?

(OR)

2. a) Define environment? Discuss the scope and importance of environmental studies?
   b) Explain the concept of ecosystem.
3. Explain the various values of biodiversity.

(OR)

4. a) Write a short note on Poaching related to biodiversity.
   b) What is the effect of loss of habitat?
5. a) Explain about impacts of modern agriculture on soil.
   b) Write a note on E-waste and its management.

(OR)

6. a) Explain how soil acts as sink for pollutants.
   b) What are the causes and effects of air pollution?
7. What are ozone depleting substances? Explain their impact on ozone layer.

(OR)

8. Write a note on sea level rise.
9. Write short notes on
   a) Environmental ethics b) Conservation of soil resources

(OR)

10. a) What is environmental information system? Give its importance in environment.
    b) What are the reasons behind the increased population growth in the less developed nations compared with developed nations.