CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations February-2024
Course Name: STRENGTH OF MATERIALS-I
(Civil Engineering)

Date: 05.02.2024 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   **10x2=20M**

1. Recall the stress-strain diagram for ductile material stating salient points.   2 M
2. A rod of 200cm long and of diameter 3cm is subjected to an axial pull of 30KN. If the young's modulus of the material of the rod is 2x105 N/mm², calculate the elongation of the rod.   2 M
3. What are the various loads acting on a beam?   2 M
4. Draw the S.F and B.M diagram for cantilever of length L carrying UDL of a w per meter over its entire length.   2 M
5. What do you understand by simple bending?   2 M
6. Sketch the distribution of shear stress for Rectangular Section.   2 M
7. Distinguish between the conjugate beam and the simply supported beam.   2 M
8. What are the advantages of Macaulay's method over other methods for the calculation of slope and deflection?   2 M
9. List any three uses of Mohr's circle.   2 M
10. Define principal plane and principal stress.   2 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). A bar of cross section 8mm x 8mm is subjected to an axial pull of 7000N. The lateral dimensions of the bar is found to be changed to 7.99mm x 7.99mm. If the modulus of rigidity of the material is 0.8×10^5 N/mm², Determine the poisons ration and modulus of rigidity?   10M

OR

11. B). A load of 100N falls to a height of 2cm collar rigidly attached to the lower end of the vertical rod 1.5m long and of 1.5 cm² cross-sectional area. The upper end of the vertical bar is fixed. Determine a) stress b) Elongation c) strain energy stored in the vertical rod. Take $E = 2 \times 10^5$ N/mm².   10M

12. A). A simply supported beam of span 10 m carries point loads 6 kN each at distance of 3 m and 5 m from left support and also a uniformly distributed load of 2 kN/m between the two point loads. Draw the S.F and B.M diagrams for the beam.   10M

(P.T.O..)

<center>**OR**</center>

12. B). Draw SFD and BMD for the beam as shown in below figure. Locate the point of contraflexure, if any   10M
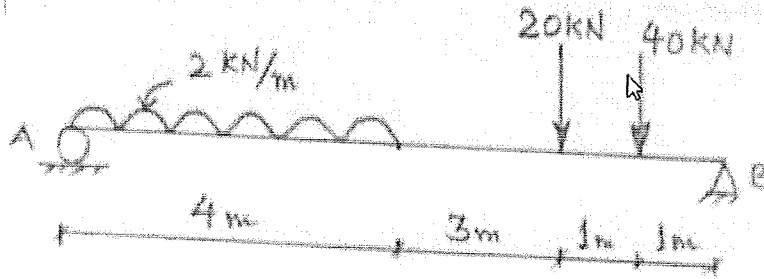
13. A). A beam of rectangular cross section 200 mm x 300 mm is subjected to shear force of 20 kN. Determine the average shear stress and man shear stress. Also draw the shear stress distribution diagram.   10M

<center>**OR**</center>

13. B). A timber beam of rectangular section of length 8m is simply supported. The beam carries a U.D.L of 12KN/m run over the entire length and a point load of 10 KN at 3m from left support. If the depth is two times the width and the stress in the timber is not to exceed 8 N/mm^2, Solve for the suitable dimensions of the section.   10M

14. A). A simply supported beam AB of span 5 M is carrying a point load of 30 kN at a distance 3.75 M from left end A. Calculate deflection under the load and max deflection. Take EI = 26 x 10^{12} N/mm^2.   10M

<center>**OR**</center>

14. B). A cantilever projecting 2.5m from a wall is loaded with a UDL of 80KN. Determine the moment of inertia of the beam section, if the deflection of the beam at the free end is 8mm. Take E = 200 Gpa. Also determine slope at the free end.   10M

15. A). A point is subjected to a tensile stress 80 MPa and a compressive stress of 40 MPa acting on two mutually perpendicular planes and shear stress of 20 MPa on these planes. Determine major and minor principal stress as well as man shear stress. Also, find the angle made by principal planes with normal cross-section by using Mohr's circle.   10M

<center>**OR**</center>

15. B). Explain: i) Maximum principal stress theory   5M
           ii) Maximum strain energy theory.   5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations February-2024

Course Name: FLUID MECHANICS

(Civil Engineering)

Date: 07.02.2024 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.   10x2=20M

1.	How do you define surface tension of a fluid?	2 M
2.	Define Hydrostatic law.	2 M
3.	Define laminar and turbulent flow.	2 M
4.	Define equation of continuity.	2 M
5.	What are the main components of the orifice meter?	2 M
6.	How are notches classified?	2 M
7.	What is the magnus effect?	2 M
8.	Define the terms drag and lift.	2 M
9.	What do you mean by a flow through series of pipes?	2 M
10.	How do you define total energy line and hydraulic gradient line?	2 M

PART-B

Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Two horizontal plates are placed 1.25 cm apart, the space between them being filled with oil of viscosity 14 poises. Solve the shear stress in oil if upper plate is moved with a velocity of 2.5 m/s.   10M

OR

11. B). A U-tube differential manometer connects two pressure pipes A and B. Pipe A contains carbon tetrachloride having a specific gravity 1.594 under a pressure of 11.772 N/cm^2 and pipe B contains oil of specific gravity 0.8 under a pressure of 11.772 N/cm^2. The pipe A lies 2.5m above pipe B. Solve the difference of pressure measured by mercury as fluid filling U-tube.   10M

12. A). Explain the path line, streak line and stream line. For what type of flow path line, streak line, and stream lines are identical.   10M

OR

12. B). The velocity potential function is given by $\emptyset = 4(X^2 - Y^2)$. Solve the velocity components at the point (2, 3).   10M

13. A). Build the Bernoulli's equation from fundamentals. State assumptions made in the derivation.   10M

OR

13. B). A Venturimeter of throat diameter 15cm is fitted into a 30 cm diameter water pipe line. The coefficient of discharge is 0.98. Solve the flow in the pipe line when the reading on a mercury water differential U tube manometer connected to the upstream and throat sections shows a reading of 40 cm.   10M

(P.T.O..)

14. A). Build an expression for the displacement thickness, momentum thickness and energy thickness for the velocity distribution in the boundary layer. 10M

OR

14. B). What do you mean by boundary layer separation? Explain the effect of pressure gradient on boundary layer separation? 10M

15. A). Explain the Reynold's experiment of pipe flow. 10M

OR

15. B). The rate of flow of water through a horizontal pipe is 0.25 m³/s. The diameter of the pipe which is 200 mm is suddenly enlarged to 400 mm. The pressure intensity in the smaller pipe is 11.772 N/cm². Solve: i) Loss of head due to sudden enlargement and ii) Pressure intensity in the large pipe. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations February-2024
Course Name: SURVEYING & GEOMATICS
(Civil Engineering)

Date: 09.02.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	What do you mean by Representative Factor (R.F.) in scales?	2 M
2.	Find the Reduced bearings for the following: 210^0, and 300^0	2 M
3.	Differentiate between simple levelling and compound levelling	2 M
4.	Define: Contour, and Contour gradient.	2 M
5.	State the limitations of Simpson's rule.	2 M
6.	Define one –level section in measurement of volume with neat sketch.	2 M
7.	List out the temporary adjustments of a theodolite.	2 M
8.	What is the use of clamping screw and tangential screw in a theodolite?	2 M
9.	Differentiate between Simple curve and Compound curve.	2 M
10.	List out the methods of tacheometry.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). i) Discuss about the classification of surveying based on the function.   5M
ii) Describe the different types of chains used in survey indicating the relative advantages   5M
of each.

OR

11. B). i) List out the basic the principles of surveying.   5M
ii) A traverse ABCDA is made in the form of a square taking in clockwise order. If the   5M
bearing of AB is 120^0 30', find the bearing of the other sides.

12. A). The following consecutive readings were taken with a dumpy level and 5 m staff on   10M
continuously sloping ground at a common interval of 15 m: 0.855, 1.545, 2.335, 3.115,
3.825, 0.455, 1.380, 2.055, 2.855, 3.455, 0.585, 1.015, 1.850, 2.755,.and 3.845. The first
point is having an elevation of 185.00 m. Rule out a page of level field book and enter the
readings. Calculate the reduced levels of the points and also calculate the gradient of the
line joining the first and the last point.

OR

12. B). What are the different methods of contouring? Discuss the methods with a neat sketch.   10M

(P.T.O..)

13. A). A series of offsets were taken from a chain line to a curved boundary   10M
       Line at intervals of 15 m in the following order.
       0, 2.65, 3.80, 3.75, 4.65, 3.60, 4.95, 5.85 m
       Compute the area between the chain line, the curved boundary and
       the end offsets by   i) trapezoidal rule   ii) Simpson's rule

                                        OR

13. B). A railway embankment 400 m long is 12 m wide at the formation   10M
       Level and has the side slope 2 to 1. The ground levels at every 100 m
       along the centre line are as under:

Distance	0	100	200	300	400
R.L.	204.8	206.2	207.5	207.2	208.3

The formation level at zero Chainage is 207.0 and the embankment has a rising gradient
of 1 in 100. The ground is level across the centre line. Calculate the volume of earth work.

14. A). Find the elevation of the top of the chimney from the following data: 10M

Inst.Station	Reading on B.M.	Angle of elevation	Remarks
A	0.862	$18^0 36'$	R.L. of B.M. = 421.380
B	1.222	$10^0 12'$	Distance AB = 50 m

Stations A and B and the top of chimney are in the same vertical plane.

                                        OR

14. B). i) Explain about the measurement of horizontal angle by repetition method.   5M
       ii) Explain about the principle of electronic theodolite and its uses.   5M

15. A). A tacheometer was set up at station 'A' and the following readings were obtained on a   10M
       vertically held staff:

Station	Staff station	Vertical angle	Cross Hair readings	Remarks
A	B.M.	$-2^0 18'$	3.225, 3.550, 3.875	R.L. of B.M
	B	$+8^0 36'$	1.650, 2.515, 3.380	= 437.655 m

Calculate the horizontal distance from A to B and the R.L. of B, if the constants of the
instrument were 100 and 0.4.

                                        OR

15. B). Two tangents intersect at chainage 1250 m. The angle of intersection is 150^0. Calculate all   10M
       data necessary for setting out a curve of radius 250 m by the deflection angle method. The
       peg intervals may be taken as 20 m.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations February-2024
Course Name: ENGINEERING MATERIALS & GEOLOGY
(Civil Engineering)

Date: 12.02.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	List out the materials required for blasting.	2 M
2.	State the purpose of studying Geology.	2 M
3.	Mention the specific gravity and color for Augite and Graphite.	2 M
4.	What is meant by Dykes and sills?	2 M
5.	State the factors influencing outcrop.	2 M
6.	Classify the different seismic zones in India.	2 M
7.	Mention the factors which influences the success of reservoir.	2 M
8.	List the different grouting methods used in dams.	2 M
9.	What are the different failures occurred during tunneling?	2 M
10.	Stat the precautions to be carried out at the time of lining in tunneling.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Discuss the application of "Engineering Geology" in civil engineering projects   10M

OR

11. B). i) State the process of Brick manufacturing.   5M
ii) State the qualities of good brick.   5M

12. A). Explain the various process of formation of ore minerals.   10M

OR

12. B). How are rocks classified? Describe the major distinguishing properties of the major rock types.   10M

13. A). What is stratification? Explain with neat figure dip, strike and unconformity along with their subtypes.   10M

OR

13. B). Define fold axis and axial plane with neat diagram. Classify folds based on position of axial plane.   10M

14. A). Explain how folds and faults affect the choice of location for dams.   10M

OR

14. B). Discuss about the process of Seismic Refraction method and their applications in Civil Engineering.   10M

15. A). Discuss about the effects of tunneling on the ground role of geological considerations for ground water.   10M

OR

15. B). State the process of laying tunnels in rock and mention the engineering challenges during the process.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations February-2024
Course Name: BASIC ELECTRICAL & ELECTRONICS ENGINEERING
(Common for CE & ME)

Date: 14.02.2024 AN　　　　Time: 3 hours　　　　Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
### Each question carries TWO marks.　　　　10x2=20M

1.	State and explain Ohm's law.	2 M
2.	List the operating forces present in indicating instruments.	2 M
3.	How are DC generators classified?	2 M
4.	What are the applications of DC motors?	2 M
5.	Define voltage regulation of a transformer.	2 M
6.	Draw torque speed characteristics of three phase induction motor.	2 M
7.	Name the two types of reverse breakdowns which occur in a P-N junction diode.	2 M
8.	What are three regions of operation of a transistor?	2 M
9.	What is meant by the deflection sensitivity of a CRO?	2 M
10.	Write the applications of CRO.	2 M

PART-B
Answer the following. Each question carries TEN Marks.　　　　5x10=50M

11.A). Using Thevenin's theorem find the current through 15 Ω resistor in figure shown.　　10M
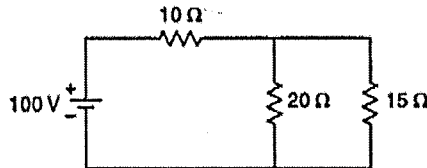
OR

11. B). Describe the construction and working of PMMC instrument.　　10M

12. A). Give the diagram and explain the working of a three point starter.　　10M

OR

12. B). Describe the construction of DC machine with neat diagram.　　10M

13. A). Derive an expression for the emf induced in a transformer winding.　　10M

OR

13. B). Discuss the principle of operation of three phase induction motor.　　10M

14. A). Draw and explain V-I characteristics of P-N junction diode.　　10M

OR

14. B). Illustrate with a diagram, how the transistor acts as an amplifier.　　10M

15. A). Draw the block diagram of a CRO and explain the function of each block.　　10M

OR

15. B). Describe the voltage, current and frequency measurements using CRO.　　10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations February-2024
Course Name: BUILDING CONSTRUCTION, PLANNING AND DRAWING
(Civil Engineering)

Date: 21.02.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions (Compulsory)
Each question carries TWO marks.   10x2=20M

1.	Define the term polishing of stones.	2 M
2.	Mention the qualities of good timber.	2 M
3.	Mention qualities of good paint.	2 M
4.	Define deep foundation.	2 M
5.	Explain the term Aspect.	2 M
6.	Classify buildings based on method of construction.	2 M
7.	Define floor space index.	2 M
8.	What are various characteristics of a residential building?	2 M
9.	List the various components of a staircase.	2 M
10.	Enumerate the elements of pitched roof.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Describe in detail the various steps followed in the manufacturing process of bricks with neat sketches.   10M

OR

11. B). i) Explain in detail the process of stone quarrying.   5M
ii) Describe with help of neat sketches the various defects formed in timber.   5M

12. A). Explain the various steps followed in preparation of surface for painting. State the advantages of painting.   10M

OR

12. B). Classify the various types of foundations. Explain in detail Pile Foundations with neat sketch.   10M

13. A). Explain the various points to be considered for natural ventilation in a building. What are principles underlying building byelaws?   10M

OR

13. B). A square sloped footing of 2.4 m side (in plan) supported a square column 450 mm side, reinforced with 10 mm dia 150 mm c/c both ways. The depth of the foundation is 2 m and footing is flat 300 mm and overall depth 600mm. The column reinforcement is 8 nos 20 mm diameter. The materials are M20 grade concrete and Fe415 steel. Draw a Plan and longitudinal elevation with suitable scale. Assume necessary data.   10M

(P.T.O..)

14. A). Discuss and explain in detail the requirements of the following in planning a residential building.   10M
   i) Living Room
   ii) Dining Room
   iii) Kitchen
   iv) Wash Rooms

OR

14. B). Explain in detail all the objectives of building bye laws.   10M

15. A). A dog legged staircase has to be provided for a public building with the staircase room size 2.6 m x 5.4 m (internal). The following details are given: 10M
   Vertical distance between the floors = 3.0 m
   Waist slab thickness=125mm
   Wall thickness =230
   Main renforcement= 12mm dia @ 120 mm c/c
   Distribution steel = 8 mm dia @ 150 mm c/c
   Grade of concrete used =M20
   Grade of steel used =Fe415
   Draw to a suitable scale the following:
   i) Plan of staircase   ii) Sectional elevation of first flight

OR

15. B). Draw a neat sketch of a King Post roof truss.   10M

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