H.T No: | | | | | | | | | | | **R18** Course Code: A30101

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech III Semester Supplementary Examinations December-2024

Course Name: Strength of Materials-I

(Civil Engineering)

Date: 17.12.2024 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks. **10x2=20M**

1. Outline the Stress-strain diagram for Mild steel with all the salient points. 2 M
2. Define Hooke's law and elastic moduli. 2 M
3. Define (i) Shear Force and (ii) Bending Moment. 2 M
4. Show the sign convention for Shear force and Bending moment. 2 M
5. What are the assumptions made in the simple bending theory? 2 M
6. Define (i) Neutral axis and (ii) Moment of resistance. 2 M
7. Recall the deflection equation for simply supported beam subjected to uniformly distributed load. 2 M
8. What are the different methods of determining slope and deflection at a section in a loaded beam? 2 M
9. Define (i) Compound stresses and (ii) Mohr's circle. 2 M
10. Find the direction of Principal stresses for the following data, direct stresses are 110N/mm^2 tensile and 47N/mm^2 compression, the shear stress on the two planes is 63N/mm^2. 2 M

PART-B

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

11.A). Applying the concept of stresses, derive an expression for change in length of bars of varying sections. 10M

OR

11. B). A steel rod of 3cm diameter and 5m long is connected to two grips and the rod is maintained at a temperature of 95^{0}C. Analyse the stress and pull exerted when the temperature falls to 30^{0}C, if 10M

i) the ends do not yield and

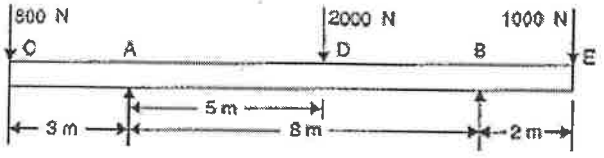
ii) the ends yield by 0.12cm.

Take E=2x10^{5}MN/m^2 and α=12x10^{-6}/^{0}C

12. A). Apply the concepts of Shear force and bending moment, and derive the relationship between load, shear force and bending moment. 10M

OR

12. B). Apply the concepts of Shear force and bending moment, and draw the Shear force diagram and bending moment diagram for beam shown in figure. 10M



(P.T.O..)

13. A). Build an expression for bending stress with usual notations. 10M

OR

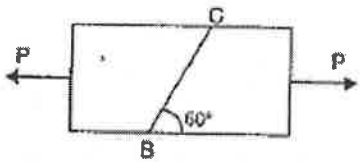
13. B). A wooden beam 100mm wide and 150mm deep is simply supported over a span of 4m. If shear force at a section of the beam is 4500N, applying the concepts, find the shear stress at a distance of 25mm above the N.A. 10M

14. A). Build an expression for deflection of a simply supported beam subjected to uniformly distributed load. 10M

OR

14. B). A cantilever of length 3m carries an uniformly distributed load of 80kN/m length over the entire length. If $E=2x10^8 kN/m^2$ and $I=10^8 mm^4$, applying the concept find the slope and deflection at the free end using Conjugate beam method. 10M

15. A). A rectangular bar of cross-sectional area of $11000mm^2$ is subjected to a tensile load P as shown in figure. The permissible normal and shear stress on the oblique plane BC are given as 7 N/mm^2 and 3.5 N/mm^2 respectively. Analyse the safe value of P. 10M



OR

15. B). At a certain point in a strained material, the intensities of stresses on two planes at right angles to each other are $20N/mm^2$ and $10N/mm^2$ both tensile. They are accompanied by a shear stress of magnitude $10N/mm^2$. Analyse using graphical method, the location of principal planes and evaluate the principal stresses. 10M

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H.T No: | | | | | | | | | | | **R18** **Course Code: A30102**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Supplementary Examinations December-2024

Course Name: Fluid Mechanics

(Civil Engineering)

Date: 19.12.2024 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks. **10x2=20M**

1. What do you mean by vapor pressure? 2 M
2. Define pascal's law. 2 M
3. What is streamline? 2 M
4. List various Lines of fluid flow. 2 M
5. Show the Impulse momentum principle. 2 M
6. Define the terms Nappe and Crest. 2 M
7. List various Boundary layer flows? 2 M
8. Define the terms laminar and turbulent boundary layers. 2 M
9. What is minor loss in pipe flow? 2 M
10. Show the Reynolds experiment. 2 M

PART-B

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

11.A). A glass tube of internal diameter 4 mm is immersed in a liquid of specific gravity 12.2 and surface tension 0.55 N/m. The angle of contact with the glass is 120^o. Solve the capillary rise or depression in the tube. 10M

OR

11. B). Solve the total pressure and depth of centre of pressure on a plane rectangular surface of 1m wide and 3 m deep when its upper edge is horizontal and i) Coincides with water surface ii) 2 m below the free water surface. 10M

12. A). Build an equation of continuity for one dimensional flow of an incompressible fluid. 10M

OR

12. B). The velocity components in a two-dimensional flow are $u = y^3/3 + 2x - x^2y$ and $v = xy^2 - 2y - x^3/3$. Show that these components represent a possible case of an irrotational flow. 10M

13. A). What is the principle of Orifice meter? Develop an expression for rate of flow of liquid through it. 10M

OR

13. B). Water is flowing through a pipe having diameter 300 mm and 200 mm at the bottom and upper end respectively. The intensity of pressure at the bottom end is 24.525 N/cm^2 and the pressure at the upper end is 9.81 N/cm^2. Solve the difference in datum head if the rate of flow through pipe is 40 Lit/s. 10M

(P.T.O..)

14. A). Explain the terms: i) Boundary layer thickness ii) Displacement Thickness iii) Energy thickness. 10M

OR

14. B). Define displacement thickness. Develop an expression for displacement thickness. 10M

15. A). Develop the Darcy Weisbach equation for head loss due to friction in pipe. 10M

OR

15. B). The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. Solve the rate of flow of water if coefficients of friction are 0.005, 0.0052 and 0.0048 respectively, considering minor losses. 10M

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H.T No: | | | | | | | | | | | **R18** | **Course Code: A30103**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Supplementary Examinations December-2024

Course Name: Surveying & Geomatics

(Civil Engineering)

Date: 21.12.2024 AN **Time: 3 hours** **Max.Marks:70**

(Note: Assume suitable data if necessary)

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

1. What is a well conditioned triangle? 2 M
2. Calculate the QB of a line whose WCB is 163 degree. 2 M
3. Define Bench mark and state the various types of benchmarks. 2 M
4. Explain the advantages of a contour map. 2 M
5. State Simpsons rule for area calculation. 2 M
6. Discuss the difference between Trapezoidal and Simpson's rule of area calculation. 2 M
7. What is face left and face right observation? 2 M
8. Define latitude and departure. 2 M
9. State the principle of Tacheometric surveying. 2 M
10. Discuss the necessity of curves. 2 M

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

11.A). Write the principle of surveying and explain the classifications of surveying. 10M

OR

11. B). The following bearings were observed for a closed traverse ABCDEA. Calculate the included angles and apply the check. 10M

LINE	F.B	B.B
AB	71° 05'	250° 20'
BC	110° 20'	292° 35'
CD	161° 35'	341° 45'
DE	220° 50'	40° 05'
EA	300° 50'	121° 10'

12. A). The following staff readings were taken with a level. The instrument having been shifted after the 4th, 7th and 10th reading. RL of the starting BM is 100.000m. Enter the readings in the form of level book page and reduce the level by the Rise and Fall method and apply usual checks. 10M

2.65, 3.74, 3.83, 5.27, 4.64, 0.38, 0.96, 1.64, 2.84, 3.48, 4.68, and 5.26

OR

12. B). Discuss the various methods of contouring with neat sketch. 10M

13. A). A railway embankment is 12m wide. The ground is level in a direction traverse to the center line. Calculate the volume contained in a 100m length by trapezoidal rule and prismoidal rule if side slope is 1.5:1. the center heights at 20m interval are 3.7m,2.6m,4m,3.4m,2.8m,3m,2.2m. 10M

(P.T.O.)

OR

13. B). The following perpendicular offsets were taken at 10m intervals from a survey line AB to an irregular boundary line, 2.30, 3.80, 4.55, 6.75, 5.25, 7.30, 8.95, 8.25 and 5.50 meters. Calculate the area in square meters, enclosed between the survey line, the irregular boundary, the first and last offsets by the application of (i) the Simpson"s rule, (ii) the trapezoidal rule, and (iii) the average ordinate rule. 10M

14. A). What are the types of theodolite and what are the temporary adjustment of theodolite. 10M

OR

14. B). To find the elevation of the top of a chimney, the following observations were made from two stations P and Q, 50m apart. 10M
Horizontal angle at station P, between chimney and Q = 60°
Horizontal angle at station Q, between chimney and P = 50°
Angle of elevation from P to the top of chimney = 30°
Angle of elevation from Q to the top of chimney = 29°
RL of the line of collimation at P = 22.5m
RL of the line of collimation at Q = 20.5m
Determine the elevation of the top of the chimney.

15. A). Discuss the various methods of tacheometry. 10M

OR

15. B). Two straights intersect at chainage 2056.44 m and the angle of intersection is 130^0. If the radius of the simple curve to be introduced is 50 m, set out the curve by offsets from long chord for 5m interval. find the following: 10M

(i) Chainage of the point of commencement
(ii) (ii) Chainage at point of tangency
(iii) Length of the long chord

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H.T No: | | | | | | | | | | | R18 | Course Code: A30105

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Supplementary Examinations Dec-2024/ Jan-2025

Course Name: Building Construction , Planning and Drawing

(Civil Engineering)

Date: 09.01.2025 FN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions

Each question carries TWO marks. **10x2=20M**

1.	What is the stretcher bond in brick masonry construction?	2 M
2.	Define seasoning of timber.	2 M
3.	Define the term distempering.	2 M
4.	Enlist different types of foundations.	2 M
5.	Give maximum and minimum sizes of hall and wash area of a residential building.	2 M
6.	Name the different types of piles used for supporting vertical loads.	2 M
7.	What is the significance of open space around a building?	2 M
8.	Write two differences between plan and section.	2 M
9.	Define the terms rise and tread in stair case.	2 M
10.	What are rafters?	2 M

PART-B

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

11.A).	i) Draw neat sketches, in plans of successive courses and elevation, to illustrate the construction of a brick wall, 1 ½ brick thick in English bond at a right angled corner.	5M
	ii) What are the advantages of timber construction.	5M
	OR	
11. B).	i) Describe the requirements of good building stones.	5M
	ii) Discuss the methods of preserving timbers.	5M
12. A).	i) What do you understand by varnishes and give its properties?	5M
	ii) Classify foundations and explain raft foundation.	5M
	OR	
12. B).	i) Write in detail on the different types of varnishes and paints.	5M
	ii) What type of foundation would you propose for a multi storyed office building in very soft soil? Describe briefly.	5M
13. A).	i) What are the objectives of underlying building bylaws?	5M
	ii) Under what circumstances, a pile foundation is adopted.	5M
	OR	
13. B).	i) Explain various plumbing fixtures in detail.	5M
	ii) Draw the elevation of R.C footings of foundations with all details used in residential buildings.	5M

(P.T.O..)

14. A). i) List out the points to be considered while planning for a residential building. 5M

ii) Explain the terminology floor space index. 5M

OR

14. B). i) Draw the conventional signs for the following: Plaster existing, Ceramic tiles, Plywood, Sand and Glass. 5M

ii) Sketch a line diagram of a two bedroom residential building that has to be constructed in an area of 20 m x 12 m. Consider the NBC guidelines in planning the building. Also, indicate various setbacks necessary. 5M

15. A). i) Draw the section of dog legged staircase with all details. 5M

ii) What are the advantages of constructing steel roof trusses over timber trusses. 5M

OR

15. B). i) What are the important points to be considered in designing of a stair case for an office building? 5M

ii) Compare king post truss and queen post truss with a neat sketch. 5M

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