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R-19

Code: 19A131T

II B.Tech. I Semester Supplementary Examinations July/August 2022

Building Materials and Construction

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks

UNIT-I

- | | |
|---|----|
| 1. a) Briefly describe dressing of stone and preservation of stone? | 7M |
| b) Write the standards for good quality of bricks. | 7M |

OR

- | | |
|---|----|
| 2. a) Differentiate between clamp burning and kiln burning. | 7M |
| b) Describe the classifications of common bricks? | 7M |

UNIT-II

- | | |
|---|----|
| 3. a) Classify the different types of gypsum and glass. | 7M |
| b) Enumerate the properties of aluminum? | 7M |

OR

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|--|----|
| 4. a) Write manufacturing methods of tile and different uses in building | 7M |
| b) Elucidate the process of manufacture of tiles. | 7M |

UNIT-III

- | | |
|--|----|
| 5. a) Explain the seasoning of timber? | 7M |
| b) Give the defects in timber? | 7M |

OR

- | | |
|--|----|
| 6. a) Explain the classification of wood used in buildings? | 7M |
| b) Explain the types of preservatives used for timber in details | 7M |

UNIT-IV

- | | |
|---|----|
| 7. a) List the various types of foundations and Explain them? | 7M |
| b) Give a list of types of bonds in brick masonry | 7M |

OR

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|---|-----|
| 8. Write about the purpose of a footing and explain clearly about shallow and spread footing? | 14M |
|---|-----|

UNIT-V

- | | |
|---|----|
| 9. a) State briefly the requirements of a good staircase. | 7M |
| b) Explain raft foundation with a sketch | 7M |

OR

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|---|-----|
| 10. Explain different types of Lintels, Arches and Stair cases and their purposes | 14M |
|---|-----|

Code: 19A134T

II B.Tech. I Semester Supplementary Examinations July/August 2022

Fluid Mechanics

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks

UNIT-I

1. State Pascal's law. Derive the equation for the same. 14M

OR

2. An open cylindrical tank of height 4m and cross sectional area 0.1m^2 contains water upto a height of 2.5m and above it an oil of specific gravity 0.8 for a depth of 1m. Find the pressure intensity of (i) surface of oil (ii) the interface between the two liquids (iii) the base of the tank. 14M

UNIT-II

3. Define and distinguish between stream line, path line and streak line. 14M

OR

4. Water is flowing vertically upwards through a pipe line having diameter 1m and 0.5 m at the base and top respectively. The pressure at the lower end is 450mm of Hg, while the pressure at the upper end is 20kN/m^2 . If the loss of head is 20% of difference in velocity head, calculate the discharge. The difference in the elevation is 4m. 14M

UNIT-III

5. Derive Darcy-Weisbach equation for turbulent flows. 14M

OR

6. A pipeline carrying water has a diameter of 0.5m and is 2.0km long. To increase the delivery another pipeline of the same diameter is introduced parallel to the first pipe in the second half of its length. Find the increase in discharge if the total head loss in both the cases is 15m. Assume $f=0.02$ for all the pipes. 14M

UNIT-IV

7. a) Explain about Reynolds Experiment with the help of a neat sketch. 8M
b) Write the characteristics of the laminar and turbulent flows. 6M

OR

8. A smooth pipe of diameter 80mm and 800 m long carries water at the rate of $0.48\text{m}^3/\text{min}$. calculate the loss of head , wall shearing stress , center line velocity and shear stress at 30mm from pipe wall. Also calculate thickness of laminar sub layer. Take kinematic viscosity as 0.015 stokes. 14M

UNIT-V

9. Define the term dimensional analysis and model analysis. Describe the Rayleigh's method for dimensional analysis with example. 14M

OR

10. a) State Buckingham's π -theorem. 4M
b) Assuming that the viscous force F , exerted by a fluid on a sphere of diameter D depends on the viscosity μ , mass density of the fluid ρ , and the velocity of the sphere v , obtain the expression for the viscous force. 10M

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Code: 19AC34T

II B.Tech. I Semester Supplementary Examinations July/August 2022

Life Sciences for Engineers

(Common to CE, ME & CSE)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

UNIT-I

- | | Marks | CO | Blooms Level |
|--|-------|-----|--------------|
| 1. Describe meant by classification? Write the importance of Classification? | 14M | CO1 | 2 |
| OR | | | |
| 2. a) Explain the five kingdom classification of living organisms? | 7M | CO1 | 2 |
| b) Describe is Endoplasmic reticulum? Write their structure and important functions and draw the labelled diagram? | 7M | CO1 | 2 |

UNIT-II

- | | | | |
|---|-----|-----|---|
| 3. a) Describe the structure of DNA & RNA? | 7M | CO2 | 2 |
| b) Explain Lock and Key Model and Induced fit model? | 7M | CO2 | 2 |
| OR | | | |
| 4. Describe the Biomolecules and write functions and types of biomolecules? | 14M | CO2 | 4 |

UNIT-III

- | | | | |
|---|-----|-----|---|
| 5. Describe about Bioenergetics and types of Bioenergetics? | 14M | CO3 | 2 |
| OR | | | |
| 6. Discuss the mechanism of photosynthesis in plants? | 14M | CO3 | 4 |

UNIT-IV

- | | | | |
|--|-----|-----|---|
| 7. a) Describe the sequential steps in the replication of DNA? | 7M | C04 | 2 |
| b) Write the importance of Genetic code? | 7M | C04 | 1 |
| OR | | | |
| 8. Describe the Gene Disorders in Humans? | 14M | C04 | 4 |

UNIT-V

- | | | | |
|--|-----|-----|---|
| 9. Describe the Biosensors, types and applications? | 14M | CO5 | 2 |
| OR | | | |
| 10. Explain the Transgenic species and process in animals? | 14M | CO5 | 2 |

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R-19

Code: 19A133T

II B.Tech. I Semester Supplementary Examinations July/August 2022

Mechanics of Materials

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

		Marks	CO	Blooms Level
UNIT-I				
1.	A bar is subjected to tensile test with a diameter of 30mm, tensile load is 54KN, gauge length 300mm and extension of the bar is 0.112mm and change in diameter 0.00366. Determine poissons ratio and three elastic constants.	14M	CO1	B4
OR				
2.	Draw the stress strain diagram for mild steel and explain the salient points	14M	CO1	B4
UNIT-II				
3.	Draw the shear force & bending moment diagram for the simply supported beam carrying a eccentric point load.	14M	CO2	B3
OR				
4.	A simply supported beam AB of span 8 m is subjected to a uniformly distributed load of 30 KN/m over the left half of span and a concentrated moment of 48 KN-m acting at a distance of 6 m from left support A. Draw the shear force and bending moment diagrams. Also find the position and magnitude of maximum bending moment.	14M	CO2	B4
UNIT-III				
5.	The tension flange of a cast iron I section beam is 240 mm wide and 50 mm deep, the compression flange is 100 mm wide 20 mm deep where as the web is 300 mm X 30 mm. Find load per meter run which can be carried over a 4 meters span by a simply supported beam. If the maximum permissible stress are 90 MPa in compression & 24 MPa in tension.	14M	CO3	B1
OR				
6.	Derive an equation for distribution of transverse shear stresses in a beam. State the assumptions made.	14M	CO3	B1
UNIT-IV				
7.	Explain Moment area theorems with neat sketch & A simply supported beam of span 8.0 m is carrying a point load of 45 kN at the centre in addition to self weight of 3 kN/m. Determine the maximum slope and maximum deflection. Take EI = 1 x 10 ⁷ kN-m	14M	CO4	B1
OR				
8.	At a point in a strained material the principal stresses are 100 N/mm ² (tensile) and 60 N/mm ² (compressive). Determine normal stress, shear stress, resultant stress on a plane inclined at 30 degrees to the axis of the major principal stress. Also determine the maximum shear stress at the point.	14M	CO4	B4
UNIT-V				
9.	Draw & Explain morh's circle when a body is subjected to two mutually perpendicular principal tensile stress of unequal intensities.	14M	CO5	B3
OR				
10.	Explain about Maximum Principal Stress theory	14M	CO5	B3

Code: 19AC31T

II B.Tech. I Semester Supplementary Examinations July/August 2022

Partial Differential Equations and Complex Variables

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

UNIT-I1. a) Find the Laplace Transform of $e^{2t} + 4t^3 - 2 \sin 3t + 3 \cos 3t$

7M CO1 L1

b) Find the L.T of $(t^2 + 1)^2$

7M CO1 L1

OR2. Find $L\left\{e^{-3t} \int_0^t \frac{\sin t}{t} dt\right\}$

14M CO1 L1

UNIT-II3. Find inverse L.T of $\frac{5s-2}{s^2(s+2)(s-1)}$

14M CO2 L1

OR4. Using convolution theorem, find $L^{-1}\left\{\frac{1}{(s+a)(s+b)}\right\}$

14M CO2 L3

UNIT-III5. Obtain the Fourier series for $f(x) = x - x^2$ in the interval $[-f, f]$. Hence Show that

$$\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots = \frac{f^2}{12}$$

14M CO3 L3

OR6. Find the half range sine series for $f(x) = x(f-x)$ in $0 < x < f$ deduce that

$$\frac{1}{1^3} - \frac{1}{3^3} + \frac{1}{5^3} - \frac{1}{7^3} + \dots = \frac{f^2}{32}$$

14M CO3 L1

UNIT-IV7. Use separation of variables to solve $\frac{\partial^2 u}{\partial x^2} = \frac{\partial u}{\partial y} + 2u$ in the form $u = f(x)g(y)$.Obtain the solution satisfying $u = 0$, $\frac{\partial u}{\partial x} = 1 + e^{-3y}$ when $x = 0$ for all values of y .

14M CO4 L3

OR

8. A homogeneous rod of conducting material of length 100 cm has its ends kept at zero temperature and the temperature initially is

$$u(x,0) = \begin{cases} x & ; 0 \leq x \leq 50 \\ (100-x) & ; 50 \leq x \leq 100 \end{cases}$$

Find the temperature $u(x,t)$ at any time.

14M CO4 L3

UNIT-V9. Find the conjugate harmonic function of the harmonic function $u = x^2 - y^2$

14M CO5 L1

OR10. Evaluate $\int_c \frac{e^{2z}}{(z-1)(z-2)} dz$ where $c : |z| = 3$.

14M CO5 L5

Code: 19A132T

II B.Tech. I Semester Supplementary Examinations July/August 2022

Surveying

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks

UNIT-I

1. a) Distinguish between closed and open traverse. 7M
 b) What is closing error' in a traverse? 7M

OR

2. Two stations A and B are not intervisible due to rising ground between them. Explain with a neat sketch how the line AB can be ranged if both the stations are visible from intermediate points. 14M

UNIT-II

3. The formation width of a road is 10m and the side slopes is 2:1. The surface of the ground has a traverse slope of 1 in 10. If the depths of cutting at the centres of three sections 60m apart are 1.5, 2.5 and 2.0m respectively, determine the volume of earth work. 14M

OR

4. The following consecutive readings were taken with a level and 4m leveling staff on a continuously sloping ground at common intervals of 30m.
 0.905(on A), 1.745, 2.345, 3.125, 3.725, 0.545, 1.390, 2.055, 2.955, 3.455, 0.595, 1.015, 1.850, 2.655, and 2.945 9(on B).
 The RL of A was 395.500. calculate the RLs of difference points and find the gradient of the line AB. 14M

UNIT-III

5. a) Describe how you would measure vertical angles. 7M
 b) How is the closing error in a traverse balanced? 7M

OR

6. a) How can the height of a tower be determined when it is inaccessible? 7M
 b) What are the methods of locating interior details in theodolite traversing? Describe the methods of checking the accuracy of close and open traverse. 7M

UNIT-IV

7. What is a two-point problem? Explain with a neat sketch the procedure of solving a two-point problem in plane table surveying. 14M

OR

8. a) What is orientation? What are the methods of orientation? Describe the methods with a sketch. 7M
 b) What are the errors that may occur in plane tabling? 7M

UNIT-V

9. What are the different types of curves? Draw neat sketches of each. 14M

OR

10. A road bend which deflects by 90° is to be designed for a maximum speed of 130km/hr, a maximum centrifugal ratio of $\frac{1}{4}$, and a maximum rate of change of radial acceleration of 35cm/s^3 . The curve should consist of a circular arc combined with two cubic spirals. Calculate : 14M
 a. The radius of circular arc, b. The requisite length of the transition curve, and
 c. The total length of the composite curve.

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R-19

Code: 19A235T

II B.Tech. I Semester Supplementary Examinations July/August 2022

Basic Electronics, Electrical & Mechanical Technology

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

Use separate booklets for **Part-A & Part-B**

PART-A

UNIT-I

- | | Marks | CO | Blooms Level |
|---|-------|-----|--------------|
| 1. Explain the terms
a) Potential difference b) Power c) Energy | 14M | CO1 | L1 |
| 2. a) State and explain Kirchoff's laws? | 7M | CO1 | L1 |
| b) Explain the constructional details of a DC machine with a neat sketch? | 7M | CO1 | L1 |

UNIT-II

- | | | | |
|---|----|-----|-------|
| 3. a) Explain how the core of transformers are constructed? | 7M | CO2 | L1&L3 |
| b) Discuss the various losses in single phase transformer? | 7M | CO2 | L1&L3 |

OR

- | | | | |
|--|----|-----|-------|
| 4. a) Explain the working principle of three phase alternator? | 7M | CO2 | L1&L3 |
| b) Describe torque-slip characteristics of induction motor? | 7M | CO2 | L1&L3 |

UNIT-III

- | | | | |
|--|----|-----|-------|
| 5. a) What are the applications of Diode? | 7M | CO3 | L1&L3 |
| b) Explain the operation of bridge rectifiers? | 7M | CO3 | L1&L3 |

OR

- | | | | |
|--------------------------------------|----|-----|-------|
| 6. a) Draw the block diagram of CRO? | 7M | CO3 | L1&L3 |
| b) Explain the principle of CRT? | 7M | CO3 | L1&L3 |

PART-B

UNIT-IV

- | | | | |
|---|----|-----|----|
| 7. a) Describe Submerge arc welding with neat sketch | 7M | CO4 | L2 |
| b) Discuss about welding fluxes and welding rods | 7M | CO4 | L2 |

OR

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|--|----|-----|----|
| 8. a) Explain Basic principles of air conditioning | 7M | CO5 | L2 |
| b) Restate the differences associated with Split Air Conditioning System and Window Air-conditioning System. | 7M | CO5 | L2 |

UNIT-V

- | | | | |
|--|----|-----|----|
| 9. a) Explain the working principle of four stroke petrol engine | 7M | CO4 | L2 |
| b) Paraphrase the following
i)Top Dead Centre ii) Bottom Dead Centre iii)Clearance Volume
iv) Swept Volume v) Compression Ratio | 7M | CO4 | L2 |

OR

- | | | | |
|---|----|-----|----|
| 10. a) How Does a Multi Stage Compressor Work? Explain | 7M | CO5 | L2 |
| b) Describe the working principle of Reciprocating Air Compressor with a neat sketch | 7M | CO5 | L2 |
