II B.Tech. I Semester Supplementary Examinations March 2021
Building Materials and Construction
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours

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

1. a) Give the detailed classification of stones?

    b) Explain about precautions to be taken while blasting of stones?

OR

2. a) Write a note on dressing of stones?

    b) Explain about kiln burning of bricks?

UNIT–II

3. Explain about the different methods of manufacturing tiles

OR

4. a) Explain about the major constituents of lime?

    b) Explain about the major constituents of cement?

UNIT–III

5. a) What is meant by seasoning of timer? Explain about any one method?

    b) Draw a net cross section of stem of an exogenous tree and show various components of it?

OR

6. What are the different defects in timber? Explain neatly?

UNIT–IV

7. a) Explain about different types of masonry?

    b) Differentiate in between English & Flemish bonds?

OR

8. What is meant by a foundation? Explain different types of foundation with neat sketches?

UNIT–V

9. a) Explain about different types of floors?

    b) Explain about queen post truss with a neat sketch?

OR

10. a) Explain about the painting of a new wood?

    b) What are the different types of paints? Explain?

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II B.Tech. I Semester Supplementary Examinations February 2021
Engineering Mathematics-III
(Common to All Branches)

Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
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UNIT–I

1. a) Find the real root of equation $x^3 - x - 11 = 0$ by bisection method.   7M

    b) Using Taylor's series method, compute the value of y at x=0.2 from $\dfrac{dy}{dx} = x + y$;

        $y(0) = 1$.   7M

OR

2. a) Find a real root of the equation $3x = \cos x + 1$ by Newton-Raphson's method correct
        to four decimal places.   7M

    b) Given $\dfrac{dy}{dx} = \dfrac{y - x}{y + x}$ with initial condition $y = 1$ at $x = 0$. Find y for $x = 0.1$ by Euler's method.
                                                                                                      7M

UNIT–II

3. a) Using Newton's forward interpolation formula and the given table of values

x	1.1	1.3	1.5	1.7	1.9
F(x)	0.21	0.69	1.25	1.89	2.61

    Obtain the value of f(x) when x = 1.2   7M

    b) Find the first and second derivatives of the function tabulated below at the point x = 1.5

x	1.5	2.0	2.5	3.0	3.5	4.0
y	3.375	7.0	13.625	24.0	38.875	59.0
                                                                                                      7M

OR

4. a) Evaluate f(10) given f(x) = 168, 192, 336 at x = 1, 7, 15 respectively. Use Lagrange
        interpolation.   7M

    b) Evaluate $\displaystyle\int_0^1 \dfrac{1}{1+x}\, dx$ by Simpson's 1/3 rule.   7M

UNIT–III

5. a) By the method of least squares, find the straight line that best fits the following data.

x	1	2	3	4	5
y	14	27	40	55	68
                                                                                                      7M

    b) Form the partial differential equation by eliminating the arbitrary constants
        $x^2 + y^2 + (z - c)^2 = a^2$ 7M

OR

6. a) Form the partial differential equations (by eliminating the arbitrary constants and
        arbitrary functions) from $z = f(x + a y) + g(x - a y)$ 7M

    b) Solve $p \tan x + q \tan y = \tan z$.   7M

UNIT–IV

7. a) Find the Fourier series expansion for $f(x) = \pi - x$ in $0 < x < \pi$ 7M

    b) Expand $f(x) = \cos x, 0 < x < \pi$ in half range sine series.   7M

OR

8.   Determine the Fourier series for $f(x) = x \sin x$ in the interval $0 < x < 2\pi$ 14M

UNIT–V

9. a) Find the finite Fourier sine and cosine Transforms of $f(x)$ defined by $f(x) = 1$ where $0 < x < \pi$ 7M

    b) Find the Fourier sin and cosine transform of $f(x) = \dfrac{e^{-ax}}{x}, a > 0$ 7M

OR

10.   Find the Fourier cosine transform of $f(x) = \dfrac{1}{1+x^2}$, hence, derive the Fourier sine transform of $w(x) = \dfrac{x}{1+x^2}$ 14M

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II B.Tech. I Semester Supplementary Examinations March 2021
Electrical Technology & Mechanical Technology
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours
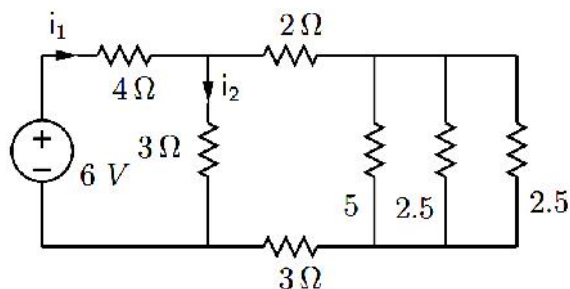Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
*Use separate booklets for **Part-A & Part-B***
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PART-A

UNIT–I

1. a) Calculate the currents i_1 and i_2 in the below circuit?

                                                                                        7M

    b) Explain the principle of operation of DC motor with constructional futures?   7M

OR

2. a) Define Ohm's law and write the limitations of it?   7M

    b) Find the current through 8 ohm resistance by using KVL & KCL?
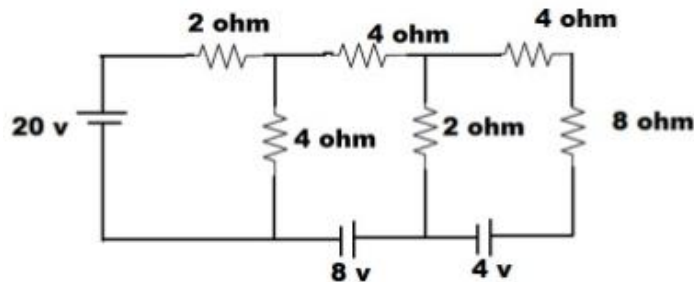
                                                                                        7M

UNIT–II

3. a) Explain the construction of three phase induction motor; with neat diagram
        explain the torque-slip characteristics?   7M

    b) Explain why induction motor is mostly preferable in industry than DC motor
        now a days?   7M

OR

4. a) Define and explain Hysteresis Loss, eddy current loss in an electrical
        machine?   7M

    b) Explain what is alternator; write a short note on construction of alternator?   7M

PART-B

UNIT–III

5. a) Describe about the working of oxy-acetylene gas welding with suitable sketch? 10M

   b) List out specific applications of gas welding? 4M

OR

6. a) What is meant by nomenclature of a welding electrode? 6M

   b) Briefly explain about various welding defects 8M

UNIT–IV

7. a) State the major applications of IC engines? 7M

   b) Distinguish between two stroke and four stroke cycles? 7M

OR

8. a) Explain in detail about a common rail diesel injection system? 8M

   b) Give the basic classification of air compressors 6M

UNIT–V

9. a) Define unit of refrigeration? 4M

   b) Explain the working principal of Electrolux refrigeration system? 10M

OR

10. a) Define psychromerty? And list important psychrometric properties? 8M

    b) Discus about comfort chart? 6M

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R-17

Code: 7G632

II B.Tech. I Semester Supplementary Examinations March 2021

Fluid Mechanics

(Civil Engineering)

Max. Marks: 70   Time: 3 Hours

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

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UNIT–I

1. a) Define vapour pressure, capillarity, surface tension and compressibility.   10M

   b) If the specific gravity of a liquid is 0.9. Determine its mass density and specific weight.   4M

OR

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

UNIT–II

3. Classify the types of flows.   14M

OR

4. The water is flowing through a pipe having diameters 0.3 m and 0.15 m at sections 1 and 2, respectively. The rate of flow through pipe is 0.04 m^3/s. The section 1 is 5 m above the datum and section 2 is 2 m above datum. If the pressure at section 1 is 30 x 10^4 N/m^2, find the intensity of pressure at section 2.   14M

UNIT–III

5. a) Explain the terms 'Total Energy line' and 'Hydraulic gradient line'.   7M

   b) Distinguish between notch and weir ,orifice and mouth piece   7M

OR

6. List the major and minor losses. Derive expressions for calculating loss of energy in a pipe flow during sudden expansion in the pipe and sudden contraction in the pipe.   14M

UNIT–IV

7. Derive the Hagen poiseuille equation for the loss of head in pipes.   14M

OR

8. An oil of viscosity 0.1 Ns/m^2 and relative density 0.9 is flowing through a circular pipe of diameter 50 mm and of length 300 m. The rate of flow of fluid through the pipe is 3.5lps. Find the pressure drop in a length of 200 m.   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. 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 " ", and the velocity of the sphere v, obtain the expression for the viscous force.   14M

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II B.Tech. I Semester Supplementary Examinations March 2021
Strength of Materials
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours
Answer any *five full* questions by choosing one question from each unit (5 x 14 = 70 Marks)
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UNIT–I

1. Define and explain the following terms
    a.) Proof stress
    b.) HOOKS law
    c.) Elasticity
    d.) Ductility

OR

2. a) Explain the stress strain relation for mild steel?

    b) Derive the expression for the analysis of uniformly tapered circular rod?

UNIT–II

3. a) Explain different types of beams, loads and supports?

    b) Define shear force and Bending moment?

OR

4. Calculate the maximum shear force and bending moment of a simply supported beam of span L subjected to Uniformly varying triangular load with an intensity of W KN/m acting at its centre?

UNIT–III

5. A rectangular beam 300mm deep is simply supported over a span of 4m.What UDL per meter, the beam may carry if the bending stress is not to exceed 120? Take $I=8X10^6 mm^4$.

OR

6. Write the assumptions and Derive the equation for theory of simple bending?

UNIT–IV

7. A simply supported beam of span 5.0 m is carrying a point load of 30 kN at the centre in addition to self-weight of 5 kN/m. Determine the maximum slope and maximum deflection. Take EI = 1 x 107 kN-m.

OR

8. Determine the slope and deflection of a simply supported beam carries the triangularly distributed symmetrical load by double integration method.

UNIT–V

9. A cylindrical shaft 100mm diameter made of steel of yield strength 350MPa is subjected to static load of 100kN and bending moment of 10kN.m and a torsional moment of 30 kN.m. Determine the factor of the shaft using Maximum principal stress theory.

OR

10. A rectangular block of a material is subjected to a tensile stress of 100N/ mm2 on one plane and a tensile stress of 47N/ mm2 on a plane right angle to the earlier, together with a shear stress of 63N/ mm2 on all the planes. Determine
    a) the magnitude of principal stresses **b)** the orientation of principal planes and **c)** the maximum shear stress.

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R-17

Code: 7G634

II B.Tech. I Semester Supplementary Examinations March 2021
Surveying
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)
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Marks

UNIT–I

1. a) Explain the classification of survey   4M

   b) The distance between two points A and B measured along slope is 504 m. Find the horizontal distance between A and B when i) The angle of slope is 12˚ ii) The slope is 1 in 4.5 and , iii) the difference in elevation of A and B is 65 m.   10M

OR

2. With neat sketches, explain different types of obstacles in chaining   14M

UNIT–II

3. a) The following consecutive readings were taken with the help of dumpy level 1.904, 2.653, 3.906, 4.026, 1.964, 1.702, 1.592, 1.261, 2.542, 2.006 and 3.145. The instrument was shifted after fourth and seventh readings. The first reading was taken on the staff held on BM of RL 100 m. Determine the R.L. of the various points by rise and fall method.   12M

   b) Mention the uses of counter map.   2M

OR

4. Describe briefly methods involved in calculating the areas.   14M

UNIT–III

5. a) Explain the permanent and temporary adjustments of Verniar theodolite.   7M

   b) Explain the measurement of a horizontal angle by repetition method.   7M

OR

6. The following observations are lengths and bearings of the lines of traverse ABCDE, the length and bearing of EA have been omitted. Calculate the length and bearing of the line EA.

Line	AB	BC	CD	DE	EA
Length (m)	204	226	187	192	?
Bearing	87˚ 30'	20˚ 20'	280˚ 0'	210˚ 3'	?

14M

UNIT–IV

7. a) Explain the method of setting out a curve by radial offsets from tangents.   12M

   b) List the various types of curves.   2M

OR

8. a) Explain the principles and characteristics of EDM   6M

   b) Discuss about microwave and electro optical system adopted in total station.   8M

UNIT–V

9. a) Explain the three point problem in Plane Tabling.   10M

   b) List the instruments used in Plane Table Surveying.   4M

OR

10. a) Explain the difference between tangential and stadia tachometry   7M

    b) How will you determine the stadia constants? Explain.   7M

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