Hall Ticket Number :										

R-17

Code: 7G631

II B.Tech. I Semester Supplementary Examinations February 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)

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Marks

UNIT–I

1.	a)	Explain about the properties of a good building stone?	7M
	b)	List out the precautions to be taken in blasting?	7M
		OR	
2.	a)	Explain in details about the classification of stones with examples.	7M
	b)	List the properties to be considered before selecting a stone for building?	7M

UNIT–II

3.	a)	Explain in detail about the different types of tiles and its purpose.	7M
	b)	Describe about Glass, bitumen, alumina and its uses?	7M
		OR	
4.	a)	Briefly explain the constituents of lime stones.	7M
	b)	Classify lime and explain its uses in different Civil Engineering Projects.	7M

UNIT–III

5.	a)	Briefly explain the structure and parts of timber?	7M
	b)	Describe the properties of good timber?	7M
		OR	
6.	a)	Classify and describe knots found in timber based on size and quality?	8M
	b)	Write a short note on methods for determination of moisture content in timber.	6M

UNIT–IV

7.	a)	Differentiate between English bond and Flemish bond?	7M
	b)	Explain the essentials of a good foundation?	7M
		OR	
8.	a)	Distinguish between Stretcher and Header bonds?	7M
	b)	Explain mat foundation and the situations where mat foundation is essential.	7M

UNIT–V

9.	a)	Discus different types of floors and roofs with uses	7M
	b)	Explain about different water proofing materials used?	7M
		OR	
10.	a)	Explain the following items in case of staircases (i) soffit (ii) Handrail (iii) pitch (iv) Rise and Tread	8M
	b)	With the help of a neat diagram explain the components of stair case	6M

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Hall Ticket Number :										

R-17

Code: **7GC32**

II B.Tech. I Semester Supplementary Examinations February 2022

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) Apply fourth order Runge-Kutta method to $\frac{dy}{dx}=3x+\frac{1}{2}y$, $y(0)=1$ determine $y(0.1)$ correct to four decimal places. 7M

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

OR

2. Find a real root of the equation $3x=\cos x+1$ by Newton-Raphson's method correct to four decimal places. 14M

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. The following table of values of x and y is given.

x	0	1	2	3	4	5	6
y	6.9897	7.4036	7.7815	8.1291	8.4510	8.7506	9.0309

   Find $\frac{dy}{dx}$ *and* $\frac{d^2y}{dx^2}$ at x=6 14M

UNIT–III

5. Form the partial differential equation by eliminating the arbitrary constants $x^2+y^2+(z-c)^2=a^2$ 14M

OR

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

b) Solve $(x^2 - yz)p + (y^2 - zx)q = (z^2 - xy)$ 7M

UNIT–IV

7. a) Find the Fourier series to represent $f(x) = ® x$ in $0 \le x \le 2$ 7M

b) Find the half range cosine series for the function $f(t) = t - t^2$, in $0 < t < 1$ 7M

OR

8. a) Find the Fourier series to represent $f(x) = |x|$ when $-® < x < ®$ and deduce that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \ldots = \frac{®^2}{8}$ 7M

b) Find the half range cosine series for the function $f(x) = x$, when $0 < x < ®$ hence show that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \ldots = \frac{®^2}{8}$ 7M

UNIT–V

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

b) Find the Fourier transform of $f(x)$ given by $f(x) = \begin{cases} 1, \ for\,|x| < 1 \\ 0, \ for\,|x| > 1 \end{cases}$ hence evaluate $\int_0^\infty \frac{\sin x}{x} dx$ 7M

OR

10. Find the finite Fourier sine and cosine transforms of $f(x)$ defined by

$$f(x) = \begin{cases} 1, 0 < x < \frac{®}{2} \\ -1, \frac{®}{2} < x < ® \end{cases}$$

14M

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Hall Ticket Number :										

R-17

Code: **7G537**

II B.Tech. I Semester Supplementary Examinations February 2022

Electrical and Mechanical Technology

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

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

Use separate booklets for Part-A & Part-B

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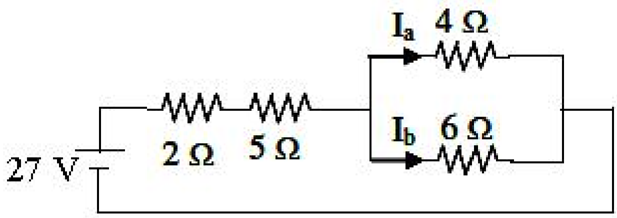
PART-A

Marks CO Blooms Level

UNIT–I

1. a) State and explain Kirchhoff's laws with examples. 7M

   b) Find the currents I_a and I_b the following circuit. What is the total power loss in the circuit?



7M

OR

2. a) Explain the Principle of Operation of DC Generator. 7M

   b) A 4-pole wave connected DC generator having 60 slots on its armature with 6 conductors per slot, run at 750 rpm and generate an open circuit voltage of 230V. Find the useful flux per pole. 7M

UNIT–II

3. a) Explain the Principle of operation of 1-ø Transformers 7M

   b) Write short notes on open circuit and short circuit tests on 1-ø Transformer. 7M

OR

4. a) Explain the Principle of operation of 3- ø Induction motor. Expression for Torque 7M

   b) Define and explain slip of 3-phase induction motor. Calculate the synchronous speed, slip and rotor frequency of a 3-phase 50 Hz, 4-pole induction motor running at 1440 rpm. 7M

PART-B

UNIT–III

5. a) What is the purpose of a shielding gas in a TIG welding? Explicate the TIG welding process with the help of a neat sketch. 7M

   b) Sketch and explain various types of flames used in oxy-acetylene welding process. 7M

OR

6. a) Explain the principle of an arc welding. Give the list of equipment's required in general for electric arc welding. 7M

   b) Describe MIG welding process stating its advantages and limitations. 7M

UNIT–IV

7. a) Explain briefly various types of lubrication systems. 7M

   b) Explain the principle of air compressor and discuss the working of a multi-stage reciprocating air compressor. 7M

OR

8. a) Classify I.C. engines. Explain the working principle of a four stroke SI engine with a neat diagram. 7M

   b) Explain the working principle of a single stage reciprocating air compressor. 7M

UNIT–V

9. a) Define a refrigerant. Can water be used as a refrigerant? Justify. 7M

   b) Discuss the importance of boiling and freezing point of R-11, R-12, R-22, R-717 and R-13 refrigerants with reference to their applications. 7M

OR

10. a) Define air-conditioning. Explain room air-conditioning system with a neat sketch. 7M

    b) Describe vapour absorption refrigeration system with a flow diagram. Also compare it with vapour compression refrigeration system. 7M

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Hall Ticket Number :										

R-17

Code: 7G632

II B.Tech. I Semester Supplementary Examinations February 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)

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			Marks
		UNIT–I	
1.		State Pascal's law. Derive the equation for the same.	14M
		OR	
2.		A hot plate of area 0.125m^2 is pulled at 0.25m/s with respect to another stationary parallel plate 1mm distant from it the space between the plates containing water of viscosity 0.001 N-s/m^2, find the force necessary to maintain this velocity and also calculate power required.	14M
		UNIT–II	
3.		Define and distinguish between stream line, path line and streak line.	14M
		OR	
4.	a)	State the Bernoulli's theorem write its assumptions.	6M
	b)	The diameters of a pipe at the sections 1 and 2 are 12cm and 17cm respectively. Find the discharge through the pipe if the velocity of water flowing through the pipe at section 1 is 6m/s. Determine also the velocity at section 2.	8M
		UNIT–III	
5.		Derive an expression for coefficient of discharge by using venture meter with neat sketch .	14M
		OR	
6.	a)	Derive an expression for the discharge over a triangular notch.	7M
	b)	During an experiment 95litres of water is flowing over a right angled notch was collected in two minutes. If the head of the still is 4cm, determine the coeffient of discharge of the notch.	7M
		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.		The two reservoirs with surface level difference of 20m are to be connected by 1m dia pipe 6km long. Calculate the discharge when a cast iron pipe of roughness k=0.3mm is used. What will be the percentage increase in discharge if cast iron pipe were to be replaced by steel pipe of roughness k=0.1mm . neglect local losses	14M
		UNIT–V	
9.		Explain the geometric, kinematic and dynamic similarities.	14M
		OR	
10.	a)	Define the terms: model, prototype, model analysis, hydraulic similitude	6M
	b)	A 1/50 model of spillway was made and test was conducted with a water flow rate of 3m^3/s. The water velocity was found to be 2m/s. Estimate the water flow rate and velocity of the prototype.	8M

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Hall Ticket Number :										

R-17

Code: 7G633

II B.Tech. I Semester Supplementary Examinations February 2022

Strength 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)

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		Marks	CO	Blooms Level
	UNIT–I			
1.	Formulate the relationship between shear modulus, bulk modulus and elastic modulus & Also Explain the stress strain relation for mild steel	14M	CO1	B2
	OR			
2.	A bar of 30mm in diameter was subjected to a tensile load of 55kN and the measured extension on 350mm gauge length was 0.15mm and change in diameter was 0.0036mm. Calculate Poisson's ratio and values of three elastic modulii.	14M	CO1	B3
	UNIT–II			
3.	A beam of span 6m which is simply supported at its edges subjected to concentrated loads of 10KN and 20KN at a distance of 2m and 5m respectively from left support, with an overhanging span of 2m from its right support subjected to UDL of 2KN/m at its overhanging span. Determine the maximum bending moment and shear force.	14M	CO2	B1
	OR			
4.	A Cantilever 2 m long carries a uniformly varying load of zero at its free end to maximum of 20kN/m at fixed end. Draw shear force and bending moment diagrams for the cantilever.	14M	CO2	B4
	UNIT–III			
5.	Write down the assumptions of simple bending theory derive the Equation of simple bending Theory	14M	CO3	B1
	OR			
6.	Define section modulus. What is its value for a hollow pipe with external and internal diameters as 'D' and 'd'	14M	CO3	B1
	UNIT–IV			
7.	Derive the expression for the maximum deflection of a simply supported beam loaded with a central point load using Mohr's theorem.	14M	CO4	B1
	OR			
8.	A cylindrical shaft of diameter made of steel of yield strength 250MPa is subjected to static load consisting of bending moment of 10kN.m and a torsional moment of 25kN.m. Determine the diameter of the shaft using (i) maximum principal stress theory, (ii) maximum shear stress theory and (iii) maximum distorsion energy theory. Take E=200GPa. Poisson;s ratio=0.25 and factor of safety =2.	14M	CO4	B4
	UNIT–V			
9.	State the significance and application of theories of failure. Derive an expression for distortion energy theory of failure.	14M	CO5	B3
	OR			
10.	Draw & Explain Morh's circle when a body is subjected to two mutually perpendicular principal stresses which are unequal & Unlike.	14M	CO5	B1

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