

--	--	--	--	--	--	--	--	--	--

**Code: 19A142T**

II B.Tech. II Semester Supplementary Examinations February 2022

**Concrete Technology**

( Civil Engineering )

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. a) List out various types of cement indicating their use for different applications. | 7M    | CO1 | L2           |
| b) What are the important tests conducted on cement to determine its quality?           | 7M    | CO1 | L2           |

**OR**

- |  |    |     |    |
|--|----|-----|----|
| 2. a) What are the effects of the shape and texture of aggregates on the strength and workability of concrete? | 7M | CO1 | L2 |
| b) List various types of tests conducted on coarse aggregate indicating the property being tested.             | 7M | CO1 | L2 |

**UNIT-II**

- |   |     |     |    |
|---|-----|-----|----|
| 3. Discuss about various methods of checking the workability at site? | 14M | CO2 | L2 |
|---|-----|-----|----|

**OR**

- |   |     |     |    |
|---|-----|-----|----|
| 4. Explain the following non-destructive tests.<br>(i) Rebound hammer (ii) Ultrasonic pulse velocity. | 14M | CO2 | L4 |
|---|-----|-----|----|

**UNIT-III**

- |  |     |     |    |
|--|-----|-----|----|
| 5. a) Explain in brief about the effects of improper curing of concrete. | 10M | CO3 | L2 |
| b) Write a short note on self curing of concrete?                        | 4M  | CO3 | L2 |

**OR**

- |   |    |     |    |
|---|----|-----|----|
| 6. a) Define shrinkage and creep. Why are shrinkage and creep treated together? | 7M | CO3 | L4 |
| b) What are the factors that affect the shrinkage and creep of concrete?        | 7M | CO3 | L4 |

**UNIT-IV**

- |   |     |     |    |
|---|-----|-----|----|
| 7. Design a concrete mix as per IS 10262: 2009, for the following data:<br>Characteristic strength $f_{ck}$ at 28 days: 40 N/mm <sup>2</sup> .<br>Cement to be used: Ordinary Portland,<br>Workability = low,<br>Coarse aggregate: 20 mm,<br>Fine aggregate = Natural Sand.<br>Specific gravity of fine aggregate = 2.8.<br>Specific gravity of coarse aggregate = 2.7. | 14M | CO4 | L4 |
|---|-----|-----|----|

**OR**

- |   |     |     |    |
|---|-----|-----|----|
| 8. Explain in detail about the provisions of durability and quality of concrete, in accordance to IS 456: 2000. | 14M | CO4 | L4 |
|---|-----|-----|----|

**UNIT-V**

- |  |     |     |    |
|--|-----|-----|----|
| 9. What is self compacting concrete? Explain the self compacting concrete mix design guidelines of EFNARC. | 14M | CO5 | L5 |
|--|-----|-----|----|

**OR**

- |  |    |     |    |
|--|----|-----|----|
| 10. a) What are the different types of polymers used in concrete?  | 7M | CO5 | L5 |
| b) What are the uses of polymer concrete? What are the key property improvements one can realize by use of polymers in concrete? | 7M | CO5 | L5 |

\*\*\*END\*\*\*

Code: 19A144T

II B.Tech. II Semester Supplementary Examinations February 2022

**Hydraulics Engineering**

( 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
<b>UNIT-I</b>			
1. a) Explain the characteristics of laminar and turbulent boundary layer.	7M		L2
b) Which factors affect the thickness or boundary layer?	7M		L1
<b>OR</b>			
2. For a linear velocity distribution in the boundary layer prove that			
$\frac{\Delta^*}{Q^*} = 3 \text{ and } \frac{\Delta^{**}}{\Delta} = \frac{1}{4}$ ,	14M		L3
<b>UNIT-II</b>			
3. a) What is the difference between pipe flow and open channel flow?	7M		L2
b) Give the relation between Chezy's constant and manning constant.	7M		L3
<b>OR</b>			
4. Derive an expression for the discharge through an open channel using Chezy's formula.	14M		L5
<b>UNIT-III</b>			
5. a) Derive an expression for jet strikes on moving plate and also work done by the jet.	7M		L5
b) A water jet coming out from a nozzle of 5cm diameter strikes a fixed plate with a velocity 20m/sec. Find the force exerted on the plate? When the plate is vertical.	7M		L4
<b>OR</b>			
6. A jet of water with a velocity of 30m/sec strikes on a series of blades moving with a velocity of 15m/sec. The jet makes an angle of 30° to the direction of motion of the entry and leaves at an angle 120°. Draw inlet and exit velocity triangles and determine as vane angles at the inlet & outlet if the water enters and leaves the vane without shock. Calculate work done by the jet of water.	14M		L4
<b>UNIT-IV</b>			
7. a) Define efficiency write down the types of efficiency's.	7M		L2
b) A Pelton wheel is designed to develop 7mw under the head of 300m when running at 550rpm. Take D/d = 10 and $\eta_o=0.85$ . Find the wheel diameter jet diameter and number of jets require.	7M		L3
<b>OR</b>			
8. A turbine works under a head of 25m at 200rpm discharging 9m <sup>3</sup> /sec. If the overall efficiency is 0.9. Find (a) power developed by the turbine, (b) specific speed of the turbine and type.	14M		L4
<b>UNIT-V</b>			
9. a) State the main components of a centrifugal pump and describe the function of each.	7M		L2
b) Prove that the specific speed of a pump is given by			
$N_s = \frac{N\sqrt{Q}}{H^{3/4}}$	7M		L1
<b>OR</b>			
10. a) Draw a neat sketch of hydroelectric power plant explain function of each component.	7M		L2
b) Write a short notes on water hammer problem.	7M		L2

\*\*\*END\*\*\*

--	--	--	--	--	--	--	--	--	--

**Code: 19AE41T**

II B.Tech. II Semester Supplementary Examinations February 2022

**Managerial Economics and Financial Accounting**

( Common to CE &amp; ME )

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
<b>UNIT-I</b>			
1. a) What is the importance and uses of Managerial Economics to Engineers? How can these concepts be used in the Manufacturing Sector?	7M	1	L1
b) Outline the objectives & uses of demand forecasting? How do you predict demand for Steel Manufacturing?	7M	1	L4
<b>OR</b>			
2. a) Describe the determinants of demand, Law of demand and its exceptions.	7M	1	L2
b) Explain with suitable diagrams, different kinds of Elasticity of demand.	7M	1	L2
<b>UNIT-II</b>			
3. a) What is marginal rate of technical substitution? How does it vary from marginal rate of substitution?	7M	2	L1
b) Define production. Analyse the Internal and External economies of large scale production.	7M	2	L4
<b>OR</b>			
4. a) Explain the importance of Cobb-Douglas production function.	7M	2	L2
b) State the determinants of cost. Distinguish between Marginal cost and Opportunity cost.	7M	2	L2
<b>UNIT-III</b>			
5. a) Define market. Highlight the difference between perfect and imperfect market.	7M	2	L2
b) Explain the price-output determination in Monopoly in long run and short run.	7M	2	L3
<b>OR</b>			
6. a) Outline the features, and advantages of sole proprietorship.	7M	2	L4
b) Explain the Objectives, features & limitations of Co-operative type of organisation.	7M	2	L3

**UNIT-IV**

7. a) Summarise the nature and scope of capital budgeting. 7M 3 L5  
 b) What are the different Methods of evaluating capital budgeting projects? 7M 3 L1

**OR**

8. a) The initial cash outlay of a project is Rs.50, 000 and it generates cash inflows of Rs.20, 000, Rs.15, 000, Rs. 25, 000 and Rs.10, 000 in four years. Using profitability index method, appraise profitability of the proposed investment assuming 10% rate of discount. 14M 3 L2

**UNIT-V**

9. a) Determine Debt-Equity Ratio, Proprietary Ratio and Funds Proportion Ratios, with the help of following information:

Description	Amount Rs.
Equity Capital	10,00,000/-
Profit & Loss A/C(Profit)	5,00,000/-
Reserves & Surplus	3,00,000/
Premium on Issue of Shares & Debentures	2,50,000/
Debentures	30,00,000/
Long Term Fixed Deposits Accepted	5,00,000/
Long Term Bank Loans	15,00,000/
Provision for Dividend & Taxation	1,50,000/
Short Term Bank Loans	5,00,000/
Fixed Assets	45,75,000/

14M 3 L2

**OR**

10. a) What are activity ratios and solvency? Give two examples of each ratio 8M 4 L2  
 b) Define financial accounting. What do you understand by 'double-entry' book keeping? 6M 4 L1

\*\*\*END\*\*\*

**Code: 19AC41T**

II B.Tech. II Semester Supplementary Examinations February 2022

**Numerical Methods & Probability and Statistics**

( Common to CE & ME )

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) Apply Newton-Raphson method to find the real root of the equation  $x^2 - 2 = 0$ .

7M    CO1    L3

b) Estimate the value of  $f(1.7)$  and  $f(3.6)$  from the following data

	$f(1.7)$	$f(3.6)$			
x	0	1	2	3	4
f(x)	1	1.5	2.2	3.1	4.6

7M    CO1    L2

**OR**

2. a) Find the root of the equation  $\cos x = x e^{-x}$  using the bisection method correct to three decimal places.

7M    CO1    L1

b) Find the interpolating polynomial using Lagrange's formula and hence find  $f(5)$  from the following data.

	0	2	3	6
f(x)	648	704	729	792

7M    CO1    L1

**UNIT-II**

3. a) Evaluate  $\int_0^6 \frac{e^x}{1+x} dx$  by using (i) Trapezoidal rule, (ii) Simpson's 1/3 rule.

7M    CO2    L3

b) Apply Taylor's method to find  $y(0.1)$  and  $y(0.2)$  to five decimals from  $y' = x + y, y(0) = 0$ .

7M    CO2    L3

**OR**

4. a) Apply Runge-Kutta method of fourth order to find approximate value of  $y$  at  $x = 0.1$ , given that  $\frac{dy}{dx} = 3e^{x^2} + 2y, y(0) = 0$  and  $h = 0.1$ .

7M    CO2    L3

b) Find  $\frac{dy}{dx}$  and  $\frac{d^2y}{dx^2}$  at  $x = 1$  for the following data

	1.0	1.1	1.2	1.3	1.4	1.5
y	5.691	6.213	6.932	7.535	8.214	9.234

7M    CO2    L1

**UNIT-III**

5. a) X is a continuous random variable with probability density function given by  $f(x) = \begin{cases} kx, & 0 \leq x < 1 \\ 2k, & 1 \leq x < 2 \\ -kx + 6k, & 2 \leq x < 3 \end{cases}$  then

Find i) k, ii) mean iii) variance

7M    CO3    L1

b) Fit a binomial distribution to the following frequency distribution

	0	1	2	3	4	5	6
f	13	25	52	58	32	16	4

7M    CO3    L2

**OR**

6. a) A random variable  $x$  has the probability function

$x$	0	1	2	3	4	5	6
$P(X=x)$	$4k$	$5k$	$7k$	$8k$	$11k$	$12k$	

(i) Find the value of the  $k$ , (ii) Evaluate  $P(X < 4)$ ,  $P(X \geq 3)$ .

7M CO3 L3

b) The mean and standard deviation of the marks obtained by 1000 students in an examination are respectively 34.4 and 16.5. Assuming the normality of the distribution, find the approximate number of students expected to obtain marks between 30 and 60.

7M CO3 L1

**UNIT-IV**

7. a) In a sample of 600 men from a certain city, 450 are found smokers. In another sample of 900 men from another city, 450 are smokers. Do the data indicate that the cities are significantly different with respect to the habit of smoking among men?

7M CO4 L4

b) Test the claim of a manufacturer that 95% of his 'stabilizers' confirm to ISI specifications if out of a random sample of 200 stabilizers produced by this manufacturer 18 were faulty. Use 0.05 level of significance.

7M CO4 L4

**OR**

8. a) A sample of 1000 days is taken from meteorological records of a certain district and 120 of them are found to be foggy. What are the probable limits to the percentage of foggy days in the district?

7M CO4 L4

b) In a random sample of 100 tube lights produced by company A, the mean lifetime (mlt) of tube light is 1190 hours with standard deviation of 90 hours. Also, in a random sample of 75 tube lights from company B the mean lifetime is 1230 hours with standard deviation of 120 hours. Is there a difference between the mean lifetimes of the two brands of tube lights at a significance level of 0.05?

7M CO4 L4

**UNIT-V**

9 The average weekly losses of man-hours due to strikes in an institute before and after a disciplinary program was implemented are as follows:

Before	45	73	46	124	33	57	83	34	26	17
After	36	60	44	119	35	51	77	29	24	11

Is there reason to believe that the disciplinary program is effective at 0.05 level of significance?

14M CO5 L2

**OR**

10. Can we conclude that the two population variances are equal for the following data of post graduates passed out from a 'state' and 'private' university?

State:	8350	8260	8130	8340	8070	
Private:	7890	8140	7900	7950	7840	7920

14M CO5 L2

\*\*\*END\*\*\*

Hall Ticket Number :										
----------------------	--	--	--	--	--	--	--	--	--	--

<b>R-19</b>
-------------

**Code: 19A143T**

II B.Tech. II Semester Supplementary Examinations February 2022

**Strength of Materials**  
( Civil Engineering )

Max. Marks: 70

Time: 3 Hours

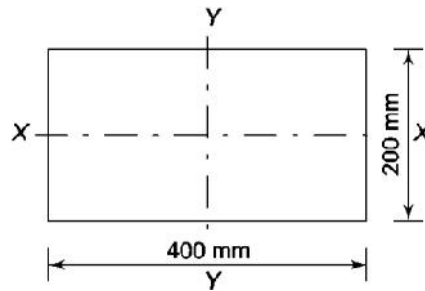
Answer any five full questions by choosing one question from each unit ( 5x14 = 70 Marks )

\*\*\*\*\*

	Marks	CO	Blooms Level
<b>UNIT-I</b>			
1. a) A cylinder has an internal diameter of 1.2m and a length of 2.5 m. The internal pressure in the cylinder is 1.5MPa. The longitudinal joint in the cylinder has an efficiency of 80% and the circumferential joint one of 50%. Find the minimum thickness required if the stresses are not to exceed 48 MPa in the circumferential direction and 32 MPa in the longitudinal direction.	7M	CO1	2
b) A thin cylindrical pressure vessel has an internal diameter of 150mm and a wall thickness of 5 mm. It is subjected to an internal pressure of 7 N/mm <sup>2</sup> . If the cylinder is 900 mm long and E = 200 GPa, find the value of Poisson's ratio for the material if the change in volume under this pressure is 15,500 mm <sup>3</sup> .	7M	CO1	2
<b>OR</b>			
2. A compound cylinder is made by shrinking a jacket on to a cylinder. For the compound cylinder, the outer and inner radii are 100mm and 60 mm, and the radius at the junction is 80 mm. Before the fluid pressure of 40 N/mm <sup>2</sup> is applied, the radial pressure at the junction is 10 N/mm <sup>2</sup> . Determine the final stresses in the cylinder. Also calculate the difference in the diameters of tubes before the jacket is shrunk on to the cylinder and the temperature at which this can be done. Take E = 200 GPa and $\alpha = 12 \times 10^{-6} / ^\circ\text{C}$ .	14M	CO1	2
<b>UNIT-II</b>			
3. A shaft has to transmit a torque of 30 kNm. The maximum shear stress is not to exceed 100 MPa and the angle of twist is not to exceed 1°/meter length. G = 80 GPa. Design the shaft according to the given specifications if it is a (i) solid circular shaft and (ii) hollow circular shaft of internal diameter 90% of the external diameter.	14M	CO2	2
<b>OR</b>			
4. An open coiled helical spring has 10 coils made out of a 12 mm diameter steel rod. The mean diameter of the coils is 80 mm and the helix angle 15°. Find the deflection under an axial load of 250 kN. What are the maximum intensities of direct and shear stresses induced in the section of the wire? If the above axial load is replaced by an axial torque of 60 N-m, determine the axial deflection and the angle of rotation about the axis of the coil. G = 80 MPa and E = 204 GPa.	14M	CO2	1
<b>UNIT-III</b>			
5. A rectangular column of wood, 3 m long, carries a load of 300 kN. Determine whether or not a section of size 200 mm x 150 mm will be able to carry this load if a factor of safety of 3 is to be used, assuming Euler's formula is applicable. E = 12.5 GPa and the permissible stress is 12 MPa. If this section will not be able to carry this load, design a square section to do so.	14M	CO3	3
<b>OR</b>			
6. a) A metal column of external diameter 300 mm and thickness 20 mm carries a load of 400 kN at an eccentricity of 50 mm. Determine the maximum and minimum stresses in the column if its length is 5 m, and both ends of the column are fixed. E = 95 GPa	7M	CO3	2
b) A steel column of length 6 m, external diameter 200 mm and thickness 10mm carries a load at an eccentricity of 30 mm. Find the maximum value of the load if the permissible stress is limited to 150 MPa. Both ends of the column are hinged. E=200GPa.	7M	CO3	2

## UNIT-IV

7. A short column of rectangular section (Fig.01) is constructed of a material with maximum permissible compressive stress  $90 \text{ N/mm}^2$  and tensile stress  $25 \text{ N/mm}^2$ . If the compressive load is  $1500 \text{ kN}$ , at what eccentricity can it be applied along the two principal axes? If the load is increased to  $3000 \text{ kN}$ , what is the permissible eccentricity along the principal axes?



14M CO4 3

OR

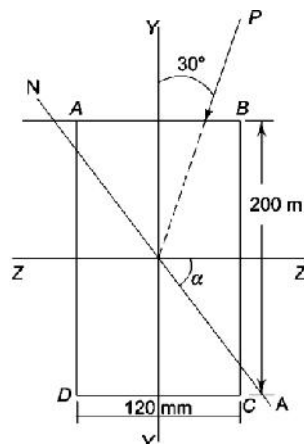
8. a) A short rod is bent in the form of an arc such that the central deflection is about  $15 \text{ mm}$ . If the maximum permissible stress is  $150 \text{ MPa}$ , find the proportionate maximum load it can carry as a compression member compared to the same rod had it been straight. The rod is square in section of side  $15 \text{ mm}$ .
- b) A steel plate of dimensions  $200 \times 25 \text{ mm}$  carries an eccentric tensile force of  $500 \text{ kN}$ . Find the maximum and minimum stresses in the section.

7M CO4 2

7M CO4 2

## UNIT-V

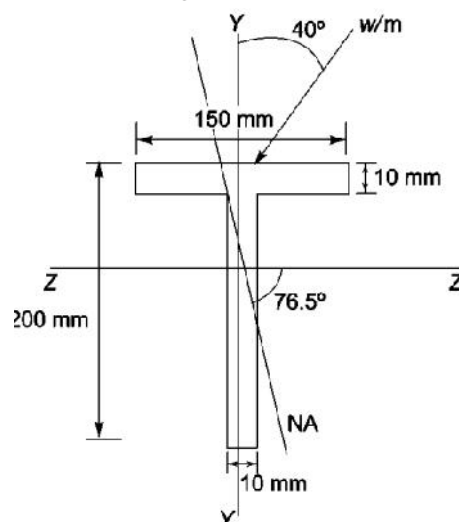
9. A rectangular section of dimensions  $120 \times 200 \text{ mm}$  is used as a beam on a  $3 \text{ m}$  span. If the beam is loaded by a concentrated load at the centre at  $30^\circ$  to the vertical as shown in Fig. 2, find the maximum value of the load 'P' if the maximum bending stress is not to exceed  $12 \text{ MPa}$ .



14M CO5 3

OR

10. The T-section shown (Fig.3) is used as a simply supported beam on a span of  $6 \text{ m}$  (UNIFORMLY DISTRIBUTED LOAD). Find the maximum value of  $w$  if the permissible stress in the material is  $120 \text{ MPa}$ . The plane of loading is inclined at an angle of  $40^\circ$  to the vertical plane and passes through the shear center.



14M CO5 3

\*\*\*END\*\*\*



Hall Ticket Number :

**R-19**

**Code: 19A141T**

II B.Tech. II Semester Supplementary Examinations February 2022

**Building Planning & Environment**

( Civil Engineering )

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. a) What is the importance of open space requirements according to building bye-laws?                               | 7M    | CO1 | L2           |
| b) Explain the importance of height of buildings according to building bye-laws?                                      | 7M    | CO1 | L2           |
| <b>OR</b>   |       |     |              |
| 2. a) Write classification of buildings? Also explain any three types of buildings?                                   | 7M    | CO1 | L2           |
| b) Write short notes on:<br>(a) Building bye-laws for lighting and ventilation.<br>(b) Building bye-laws for offsets. | 7M    | CO1 | L2           |

**UNIT-II**

- |  |    |     |    |
|--|----|-----|----|
| 3. a) Why do you need more ventilation in kitchen than in living rooms or bed rooms? Justify your answer with standards of building specification. | 7M | CO2 | L2 |
| b) What is meant by aspect, prospect, circulation and grouping? Explain its importance?  | 7M | CO2 | L2 |
| <b>OR</b>  |    |     |    |
| 4. a) Write the minimum standards for various parts of buildings and explain?  | 7M | CO2 | L2 |
| b) What are the factors to be considered by planner prior to planning of a residential building? Explain one of them in detail                     | 7M | CO2 | L2 |

**UNIT-III**

- |  |    |     |    |
|--|----|-----|----|
| 5. a) Write the importance and necessity in planning of industrial buildings?                                    | 7M | CO3 | L2 |
| b) Write the importance and necessity in planning of hotels and motels   | 7M | CO3 | L2 |
| <b>OR</b>  |    |     |    |
| 6. a) Write the importance and necessity in planning of buildings for recreation.                                | 7M | CO3 | L2 |
| b) Describe the important departments and facilities to be provided in the layout of a educational institutions. | 7M | CO3 | L2 |

**UNIT-IV**

- |   |     |     |    |
|---|-----|-----|----|
| 7. a) Differentiate clearly between PERT and CPM network methods.   | 4M  | CO4 | L2 |
| b) Define the following:-<br>(i) Activity. (ii) Arrow. (iii) Interfering float. (iv) Optimum time estimate                  | 10M | CO4 | L2 |
| <b>OR</b>   |     |     |    |
| 8. a) Draw the diagrams showing activity oriented network and event oriented network to the mass concreting for foundation. | 6M  | CO4 | L4 |
| b) Define the following:<br>(i) Slack time. (ii) Interfering float. (iii) Backward pass. (iv) L.F.T.                        | 8M  | CO4 | L2 |

**UNIT-V**

- |  |     |     |    |
|--|-----|-----|----|
| 9. Write short notes on:<br>(a) Temperature and Humidity extremes (b) air quality and quantity             | 14M | CO5 | L2 |
| <b>OR</b>  |     |     |    |
| 10. Write short notes on:<br>(a) Benefits of Green Design (b) Global warming (c) Thermal Comfort standards | 14M | CO5 | L2 |

\*\*\*END\*\*\*