

Hall Ticket Number :

**R-20**

**Code: 20AC36T**

II B.Tech. I Semester Supplementary Examinations July 2023

**Managerial Economics and Financial Analysis**

(Common to CE & ECE)

Max. Marks: 70

Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)

2. In Part-A, each question carries **Two marks**.

3. Answer **ALL** the questions in **Part-A** and **Part-B**

**PART-A**

(Compulsory question)

1. Answer **all** the following short answer questions ( 5 X 2 = 10M )
- |  |     |    |
|--|-----|----|
|  | CO  | BL |
| a) State the law of demand.                              | CO1 | L2 |
| b) Write a short note on Isoquants.                      | CO2 | L1 |
| c) What is joint Hindu family business?                  | CO3 | L1 |
| d) List the methods of capital budgeting.                | CO4 | L3 |
| e) Differentiate tangible assets from intangible assets. | CO5 | L1 |

**PART-B**

Answer **five** questions by choosing one question from each unit ( 5 x 12 = 60 Marks )

Marks CO BL

**UNIT-I**

2. Explain the reasons why demand curve always slopes downwards. 12M CO1 L2

**OR**

3. What are the various forecasting techniques? Explain each of them in detail. 12M CO1 L2

**UNIT-II**

4. Explain the behavior of Total Cost (TC), Total Variable Cost (TVC) and Total Fixed Cost using suitable cost-output diagram. 12M CO2 L4

**OR**

5. From the following information calculate the breakeven point and the turnover required to earn a profit of Rs.36,000. Given that  
Fixed overheads-Rs.1,80,000  
Variable cost per unit-Rs.2/ and Selling price-Rs.20/.  
If the company is earning a profit of Rs.36, 000, find the margin of safety available to it. 12M CO2 L1

**UNIT-III**

6. Explain the price output decision under monopolistic competition in the long run with the help of diagram. 12M CO3 L1

**OR**

7. Summarize the differences between private company and public company. 12M CO3 L1

**UNIT-IV**

8. Discuss the different sources of raising capital, for an organization. 12M CO4 L1

**OR**

9. Compute the NPV for the projects X and Y and choose the best. The firm's cost of capital is 10%.

Year	Project X	Project Y
0	70,000	70,000
1	10,000	50,000
2	20,000	40,000
3	30,000	20,000
4	45,000	10,000
5	60,000	10,000

12M CO4 L4

**UNIT-V**

10. a) Discuss the importance of financial statement analysis in business. 6M CO5 L3
- b) Summarize the managerial applications of ratio analysis. 6M CO5 L3

**OR**

11. Journalize the following entries in the Books of M/s. Rock Well Industries Ltd.

No	Date	Description	Rs. Lakhs
1	01-05-2020	Started Business with cash	5.00
2	02-05-2020	Deposited in Andhra Bank	3.00
3	05-05-2020	Purchased Goods on Credit from ABC Ltd	15.00
4	08-05-2020	Sold goods on Credit to XYZ Ltd	5.00
5	10-05-2020	Paid Freight Charges by Cheque	0.25
6	25-05-2020	Paid Salaries from Bank	2.00
7	30-05-2020	Drawn Cash from Bank	5.00
8	31-05-2020	Purchased Furniture on Credit from GBL	1.20

12M CO5 L3

\*\*\* End \*\*\*.

Hall Ticket Number :

**R-20****Code: 20AC31T**

II B.Tech. I Semester Supplementary Examinations July 2023

**Partial Differential Equations and Numerical Methods**

(Common to CE and ME )

Max. Marks: 70

Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. In Part-A, each question carries **Two marks**.3. Answer **ALL** the questions in **Part-A** and **Part-B****PART-A****(Compulsory question)**

1. Answer **all** the following short answer questions ( 5 X 2 = 10M )
- |  |     |    |
|--|-----|----|
|  | CO  | BL |
| a) Establish a iterative formula to find $\sqrt{N}$                                  | CO1 | L3 |
| b) State Lagrange's interpolation formula for unequal intervals.                     | CO2 | L1 |
| c) Write $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x_0$ using forward differences. | CO3 | L2 |
| d) Write the formula to find $K_2$ $K_4$ in R-K method of 4 <sup>th</sup> order.     | CO4 | L1 |
| e) State 1-D and 2-D steady state heat flow equation                                 | CO5 | L1 |

**PART-B****Answer five questions by choosing one question from each unit ( 5 x 12 = 60 Marks )**

Marks CO BL

**UNIT-I**

2. a) Using the bisection method, find a real root of the equation  $e^x = 4\sin x$  correct to three decimal places
- b) Find a positive root of the equation  $x^4 - x = 10$ , Using Newton Raphson method.
- |  |    |     |    |
|--|----|-----|----|
|  | 6M | CO1 | L3 |
|  | 6M | CO1 | L4 |

**OR**

3. a) Find a root of the equation  $x^3 - 4x - 9 = 0$  using the regula-falsi method.
- b) Find a root of the  $\cos x - 3x + 1 = 0$  by choosing Iteration method.
- |  |    |     |    |
|--|----|-----|----|
|  | 6M | CO1 | L3 |
|  | 6M | CO1 | L4 |

**UNIT-II**

4. a) Construct Newton's forward interpolation polynomial for the following data.

x	4	6	8	10
y	1	3	8	16

- b) Estimate the valued  $f(42)$  from the following data.

X	20	25	30	35	40	45
f(x)	354	332	291	260	231	204

**OR**

5. a) From the following table of half yearly premium for policies maturing at different ages, estimate the premium for policies maturing at the age 46.

Age	45	50	55	60
Premium in Rupees	100	122	153	178

6M CO2 L3

6M CO2 L3

6M CO2 L3

- b) Using Lagrange's formula find the value of  $y$  when  $x = 10$ .

x	5	6	9	11
y	12	13	14	16

6M CO2 L3

UNIT-III
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6. Given that

X	1.0	1.2	1.4	1.6	1.8	2.0
Y	0	0.128	0.544	1.296	2.432	4.000

Find  $\frac{dy}{dx}$  and  $\frac{d^2y}{dx^2}$  at  $x = 1.1$

12M CO3 L4

OR

7. a) Calculate the value of  $\int_0^{\frac{\pi}{2}} \sin x \, dx$  by Simpson's 1/3 rule, using 11 ordinates.

6M CO3 L3

- b) Using Trapezoidal rule Estimate  $\int_0^2 e^{x^2} dx$  taking 10 intervals.

6M CO3 L3

UNIT-IV
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8. Use Runge-Kutta method of fourth order to find  $y$  when  $x = 1.2$  in steps of 0.1, given that  $\frac{dy}{dx} = x^2 + y^2$  and  $y(1) = 1.5$ .

12M CO4 L4

OR

9. a) Solve  $y' = 1 - y$ ,  $y(0) = 0$  by modified Euler's method and obtain  $y$  at  $x = 0.1$ .  
 b) Find an approximate value of  $y$  when  $x = 0.1$ , if  $\frac{dy}{dx} = x - y^2$  and  $y = 1$  at  $x = 0$ , using Picard's method.

6M CO4 L3

6M CO4 L3

UNIT-V
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10. The points of trisection of a string are pulled a side through the same distance on opposite sides of the position of equilibrium and the string is released from rest. Derive an expression for the displacement of the string at subsequent time and show that the mid-point of the string always remains at rest.

12M CO5 L4

OR

11. An insulated rod of length  $l$  has its ends A and B maintained at  $0^\circ\text{C}$  and  $100^\circ\text{C}$  respectively until steady state prevail. If B is suddenly reduced to  $0^\circ\text{C}$  and maintained at  $0^\circ\text{C}$ , find the temperature at a distance  $x$  from A at time  $t$ .

12M CO5 L4

\*\*\* End \*\*\*

Hall Ticket Number :

R-20

Code: 20A132T

II B.Tech. I Semester Supplementary Examinations July 2023

**Strength of Materials**

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. In Part-A, each question carries **Two marks**.3. Answer **ALL** the questions in **Part-A** and **Part-B****PART-A**

(Compulsory question )

1. Answer **all** the following short answer questions ( 5 X 2 = 10M )

CO BL

- |   |   |   |
|---|---|---|
| a) Define factor of safety  | 1 | 2 |
| b) What do you mean by point of contra flexure?   | 2 | 2 |
| c) Write the assumptions made in the theory of simple bending   | 3 | 2 |
| d) Write formulas for maximum deflection and maximum bending moment for simply supported beam subjected to a point load at centre | 4 | 2 |
| e) List out various theories of failures in stresses  | 5 | 2 |

**PART-B**Answer **five** questions by choosing one question from each unit ( 5 x 12 = 60 Marks )

Marks CO BL

**UNIT-I**

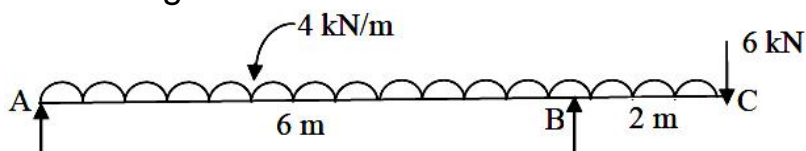
2. A 1 m long bar of rectangular cross section 50 x 80 mm is subjected to an axial load of 1.2 kN. Write the maximum stress and strain energy developed in the bar if the load applied is: (i) Gradual. (ii) Sudden. (iii) Falls through a height of 25 mm. Take  $E = 205 \text{ GPa}$ .
- 12M 1 3

**OR**

3. A specimen of steel 25mm diameter with a gauge length of 200mm is tested to destruction .It has an extension of 0.16mm under a load of 80kN and the load at elastic limit is 160kN .The maximum load is 180kN.The total extension at fracture is 56mm and diameter at neck is 18mm. Find the (i) stress at elastic limit (ii) Young's modulus (iii) Percentage of elongation (iv) Percentage of reduction in area and (v) Ultimate tensile stress.
- 12M 1 4

**UNIT-II**

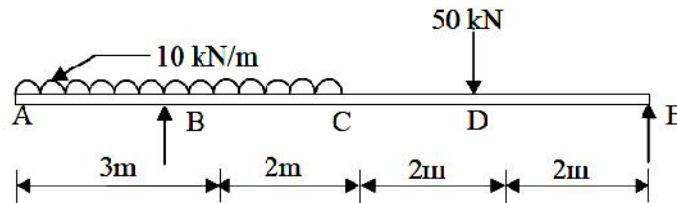
4. An overhanging beam is shown in below Figure. Draw the S.F and B.M diagrams



12M 2 3

OR

5. Draw Shear Force Diagram and Bending Moment diagram for the beam shown below



12M 2 4

UNIT-III

6. For a T – section with dimensions flange width 100mm, Depth = 200mm and uniform thickness of 40mm. obtain shear stress distribution and calculate maximum and average shear stresses if it is subjected to a S.F.=100 KN.

12M 3 3

OR

7. a) Derive the simple bending equation  
b) Explain about design of simple beam sections

6M 3 3

6M 3 2

UNIT-IV

8. A simple beam of span 4 m is loaded uniformly with 40 kN/m for the third quarter of the span from the left end. Using Macaulay's approach, determine the maximum deflection.  $E=2 \times 10^5$  MPa and  $I = 5 \times 10^7$  mm<sup>4</sup>.

12M 4 4

OR

9. Determine the deflection of the simply supported beam AB of length 9m carrying two point loads 30 kN and 50 kN at a distance of 3 m and 7 m respectively from the left support using moment area method

12M 4 3

UNIT-V

10. A cylindrical drum 400 mm in diameter has a thickness of 8mm. If the drum is subjected to an internal pressure of 2 N/mm<sup>2</sup>, determine the increase in the volume of the drum. Take young's modulus of elasticity,  $E=1.6 \times 10^5$  N/mm<sup>2</sup> and poisson's ratio = 0.25.

12M 5 4

OR

11. Direct stresses of 120MPa tension and 90 MPa compression are applied to an elastic material at a certain point on the planes at right angles. The maximum principal stress is limited to 150MPa. What is the corresponding shear stress on the given planes and the maximum shearing stress at that point?

12M 5 4

\*\*\* End \*\*\*

Hall Ticket Number :									
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<b>R-20</b>
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**Code: 20A131T**  
 II B.Tech. I Semester Supplementary Examinations July 2023  
**Advanced Surveying**  
 (Civil Engineering)

Max. Marks: 70 Time: 3 Hours

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. In Part-A, each question carries **Two marks**.  
 3. Answer **ALL** the questions in **Part-A** and **Part-B**

**PART-A**

(Compulsory question)

- |   |    |    |
|---|----|----|
| 1. Answer <b>all</b> the following short answer questions ( 5 X 2 = 10M ) | CO | BL |
| a) Define ranging.  | 1  |    |
| b) What is whole circle bearing?  | 2  |    |
| c) What is an anallatic lens? What is the use of an anallatic lens?       | 3  |    |
| d) What are the different systems of tachometric measurements?            | 4  |    |
| e) Write short note on Stereoscope.                                       | 5  |    |

**PART-B**

Answer *five* questions by choosing one question from each unit ( 5 x 12 = 60 Marks )

Marks CO BL

<b>UNIT-I</b>
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- |   |  |  |     |
|---|--|--|-----|
| 2. What are the accessories required for a chain survey? Explain the functions of each. |  |  | 12M |
|---|--|--|-----|

**OR**

3. The following are the bearings observed with a compass, in an area where local attraction was suspected. Calculate the interior angles of the traverse and correct them if necessary.

Line	AB	BC	CD	DE	EA
FB	150°00′	230°30′	306°15′	298°00′	49°30′
BB	330°00′	48°00′	127°45′	120°00′	229°30′

12M

<b>UNIT-II</b>
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4. The following consecutive readings were taken with a dumpy level and a 4 m levelling staff on a continuously sloping ground on a straight line at a common interval of 30 m. 0.855 (on A), 1.545, 2.335, 3.115, 3.825, 0.455, 1.380, 2.055, 2.855, 3.455, 0.585, 1.015, 1.850, 2.755, 3.845 (on B). The R.L of A was 380.5 m. Make a level field book and calculate the reduced levels of points using Hiegt of Instrument method and apply usual checks.

12M

**OR**

- |  |  |  |    |
|--|--|--|----|
| 5. a) Describe the various uses of contour maps. |  |  | 6M |
|--|--|--|----|

- b) The offsets taken at 5 m intervals from a chain line to a curved boundary are: 0, 4.6, 6.5, 6.8, 5.2, 3.5, 2.2 metres. Calculate the area between the chain line, the curved boundary line and the end offsets using Simpson's rule. 6M

## UNIT-III

6. The lengths and bearings of lines of closed traverse ABCDE are given below. Examine the lengths and bearing of line EA.

Line	Length, m	Bearing
AB	194.1	85° 30'
BC	201.2	15° 00'
CD	165.4	285° 30'
DE	172.6	195° 30'

12M

**OR**

7. a) Explain the theodolite traversing by method of included angles. 8M  
b) How would you determine the error of closure? Explain. 4M

## UNIT-IV

8. A tachometer is setup at an intermediate point on a traverse course PQ and the following observations are made on a staff held vertical.

Staff Station	Vertical Angle	Staff Intercept	Axial Hair Readings
P	+9° 30'	2.250	2.105
Q	+6° 00'	2.055	1.975

The constants are 100 and 0. Compute the length PQ and the reduced level of Q. RL of P = 350.50 m. 12M

**OR**

9. a) Explain fixed hair method and movable hair method of tachometry. 6M  
b) Derive the tachometric equation for horizontal line of sight. 6M

## UNIT-V

10. a) Mention the general features of photographic image. 6M  
b) A line AB 2000 m long lying at an elevation of 500 m measures 8.65 cm on a vertical photograph for which focal length is 20 cm. Determine the scale of a photograph in an area the average elevation of which is about 800 m. 6M

**OR**

11. a) Express the procedure for aerial survey. 6M  
b) A vertical photograph was taken at an altitude of 1200 m above mean sea level. Determine the scale of photograph for a terrain lying at elevation of 80m and 300m. If the focal length of camera is 15 cm. 6M

\*\*\* End \*\*\*



Code: 20A133T

II B.Tech. I Semester Supplementary Examinations July 2023

**Fluid Mechanics and Hydraulic Engineering**

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. In Part-A, each question carries **Two marks**.3. Answer **ALL** the questions in **Part-A** and **Part-B****PART-A**

(Compulsory question)

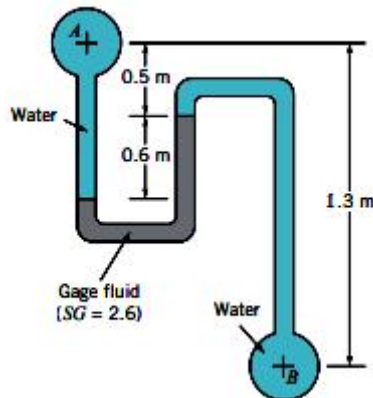
- |  |    |    |
|--|----|----|
| 1. Answer <b>all</b> the following short answer questions ( 5 X 2 = 10M )                    | CO | BL |
| a) Explain The difference between Atmospheric pressure, Gauge pressure and Absolute pressure | 1  | L3 |
| b) Explain Streamline and Path line  | 2  | L3 |
| c) Define momentum equation and mention its applications                                     | 3  | L2 |
| d) Define laws of fluid friction   | 4  | L2 |
| e) Explain the significance of surge tank.   | 5  | L3 |

**PART-B**Answer **five** questions by choosing one question from each unit ( 5 x 12 = 60 Marks )

Marks CO BL

**UNIT-I**

2. a) Two pipes are connected by a manometer as shown in Fig.



Determine the pressure difference, between the pipes

6M 1 L4

- b) An open cylindrical tank of height 4m and cross sectional area  $0.1\text{m}^2$  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.

6M 1 L4

**OR**

3. a) Prove that the reaction between the gates of lock is equal to reaction at hinge?
- b) Determine the total pressure on a circular plate of diameter 1.5 m which is placed vertically in water in such a way that the centre of the plate is 2 m below the free surface of water. Find the position of centre of pressure also.

6M 1 L3

6M 1 L4

**UNIT-II**

4. a) Discuss the conditions for vorticity and irrotationality.

4M 2 L2

- b) Show that the streamlines for a flow whose velocity components are  $u=c(x^2-y^2)$  and  $v = -2cxy$ , where  $c$  is a constant, are given by the equation  $x^2y-y^3/3=\text{constant}$ . At which point (points) is the flow parallel to the  $y$  axis? At which point (points) is the fluid stationary?

8M 2 L4

OR

5. a) Derive an expression for three dimensional continuity equation for fluid flow. State necessary assumptions
- b) The velocity potential function for a 2-D fluid flow is  $\phi=4x(1-2y)$ . At a point  $P(4,5)$  determine (i) flow velocity (ii) the value of stream function

8M 2 L4

4M 2 L4

## UNIT-III

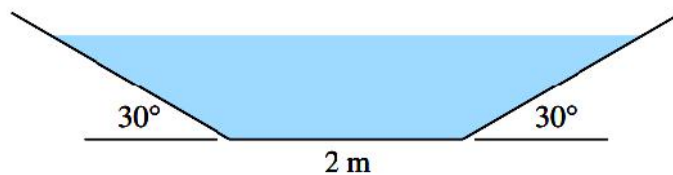
6. a) State the momentum equation. Derive momentum equation for determining the force exerted by a flowing liquid on a pipe bend
- b) A rectangular channel 5 m wide carries 2500 lit/sec at a depth of 1 m. What height of a broad crested rectangular weir must be installed to double the depth? Assume weir coefficient of 0.88.

5M 3 L3

7M 3 L4

OR

7. a) The trapezoidal channel of Fig. is made of brickwork and slopes at 1:500. Determine the flow rate if the normal depth is 80 cm.



8M 3 L4

- b) Derive Bernoulli's equation

4M 3 L2

## UNIT-IV

8. Derive Darcy-Weisbach equation. State the assumptions.

12M 4 L3

OR

9. a) Derive Hazen-Poiseuille equation for laminar flow in circular pipes
- b) For laminar flow of oil having dynamic viscosity is 1.65 Pa.s in a 0.25 m dia pipe, the velocity distribution is parabolic with a maximum point velocity of 4 m/s at the Centre of the pipe. Calculate the shearing stresses at pipe wall and within the fluid 40mm from the pipe wall.

4M 4 L2

8M 4 L4

## UNIT-V

10. a) With a neat sketch Explain the important parts of centrifugal pump
- b) A centrifugal Pump is to discharge 0.25 m<sup>3</sup>/s at a speed of 1500 RPM against a head of 25 m. the impeller diameter is 250 mm, its width at outlet is 50 mm and manometric efficiency is 75%. Determine the vane angle at the outer periphery of the impeller.

5M 5 L2

7M 5 L4

OR

11. a) Classify the hydraulic turbines and With a neat sketch the parts of Pelton turbine.
- b) Design a pelton wheel for head of 60 m, running at speed of 200 RPM and develops shaft power of 100 kW. Velocity of bucket is half the velocity of jet and overall efficiency is considered to be 90% and coefficient of velocity is 0.98.

5M 5 L4

7M 5 L4

\*\*\* End \*\*\*