

Hall Ticket Number :

R-20

Code: 20AC45T

II B.Tech. II Semester Supplementary Examinations Dec 2022 / Jan 2023

**Managerial Economics & Financial Analysis**

(Common to EEE &amp; 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 mark**.  
 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	Blooms Level
a) Explain Arc method for measurement of elasticity of demand.	CO1	L2
b) Define contribution. Explain any two formulas for calculation of contribution	CO2	L1
c) Explain any four types of costs?	CO3	L2
d) What are the examples of oligopoly market?	CO4	L1
e) What is the profitability index formula?	CO5	L1

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

- |                                                                                      |    |     |    |
|--------------------------------------------------------------------------------------|----|-----|----|
| 2. a) Define Managerial Economics. Explain its scope.                                | 6M | CO1 | L1 |
| b) What do you understand by elasticity of demand? Explain the factors governing it. | 6M | CO1 | L1 |

**OR**

- |                                                                                     |    |     |    |
|-------------------------------------------------------------------------------------|----|-----|----|
| 3. a) Define Law of Demand. What are its exceptions? Explain.                       | 6M | CO1 | L1 |
| b) How managerial economics is related with 'accounting' and 'statistics'? Discuss. | 6M | CO1 | L1 |

**UNIT-II**

- |                                                                                                                                                                                                              |    |     |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|----|
| 4. a) Consider the following data of a company for the year 2020: Sales Rs. 1,20,000, Fixed cost Rs. 25,000, Variable cost Rs. 45,000<br>Find: i. Contribution ii. Profit iii. BEP, and iv. Margin of safety | 6M | CO2 | L3 |
| b) Explain difference between ISO-quants and ISO-costs.                                                                                                                                                      | 6M | CO2 | L3 |

**OR**

- |                                                                                  |    |     |    |
|----------------------------------------------------------------------------------|----|-----|----|
| 5. a) Why does law of diminishing returns operate? Illustrate with assumed data. | 6M | CO2 | L1 |
| b) Define break-even point. Draw a break-even chart and explain its components.  | 6M | CO2 | L1 |

**UNIT-III**

- |                                                                                                     |    |     |    |
|-----------------------------------------------------------------------------------------------------|----|-----|----|
| 6. a) Define Monopoly? How are price and output determined under monopoly?                          | 6M | CO3 | L1 |
| b) What do you mean by joint stock company? Enumerate the different types of Joint Stock companies. | 6M | CO3 | L1 |

**OR**

- |                                                                    |    |     |    |
|--------------------------------------------------------------------|----|-----|----|
| 7. a) Differentiate between Monopolistic and Oligopoly Markets     | 6M | CO3 | L3 |
| b) Explain advantages and disadvantages of co-operative societies. | 6M | CO3 | L2 |

<b>UNIT-IV</b>
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8. a) Consider the case of the company with the following two investment alternatives each costing 9,00,000. The details of the cash inflows are as follows:

Year	Cash flows (in Rs.)	
	Project-1	Project- 2
1	3,00,000	6,00,000
2	5,00,000	4,00,000
3	6,00,000	3,00,000

The cost of capital is 10% per year. Which one will you choose under NPV Method? PV Factors @10% : 0.909, 0.826, 0.751

6M CO4 L4

- b) Define capital. Explain importance of capital in an organization

6M CO4 L1

**OR**

9. a) What is capital budgeting? Explain its needs and importance.

6M CO4 L1

- b) Define capital. Explain various types of capital

6M CO4 L1

<b>UNIT-V</b>
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10. a) What does a ratio analysis measure? Explain significance of ratio analysis.

6M CO5 L1

- b) Define Accounting. Explain objectives of accounting.

6M CO5 L1

**OR**

11. The Trail balance of Mr. Ramesh as on 31st March, 2020 revealed the following balances. Prepare trading, profit and loss A/c for the year ending 31st March, 2020 and a balance Sheet as on that date.

Particulars	Amount	Particulars	Amount
Plant & machinery	160,000	Capital account	200,000
Purchases	136,000	Sales	250,000
Sales returns	2,000	Purchase returns	6,550
Opening stock	60,000	Discount received	1,600
Discount allowed	700	Sundry creditors	50,000
Bank charges	150		
Sundry debtors	90,000		
Salaries	16,000		
Wages	20,000		
Insurance	1,500		
Rent and rates	4,000		
Advertisements	4,000		
Cash in hand	13,800		
	<b>508,150</b>		<b>508,150</b>

Adjustments:

- i) Closing Stock was valued at Rs. 70,000,  
 ii) Outstanding Salaries Rs.1000, and  
 iii) Prepaid insurance Rs.500

12M CO5 BL5

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

Hall Ticket Number :

R-20

Code: 20AC42T

II B.Tech. II Semester Supplementary Examinations Dec 2022 / Jan 2023

**Numerical Methods and Random Variables**

(Common to EEE &amp; 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 mark**.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

Blooms  
Level

a) Find the missing term in the following data:

C01

L1

	2	3	4	5	6
$y_i$	45.0	49.2	54.1	---	67.4

b) Given  $\frac{dy}{dx} = x + y$  with initial condition  $y = 1$  at  $x = 0$ ; find  $y$  for  $x = 0.1$  by Euler's method. Use  $h = 0.05$ .

C02

L1

c) Write the empirical relation between mean, median and mode.

C03

L2

d) A pair of dice is tossed twice. Find the probability of scoring 7 points twice.

C04

L1

e) Determine the probability of getting 9 exactly twice in 3 throws with a pair of fair dice.

C05

L3

**PART-B**

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

Marks

CO

Blooms  
Level**UNIT-I**2. a) By using the bisection method find an approximate root of the equation  $\sin x = \frac{1}{x}$ , that lies between  $x = 1$  and  $x = 1.5$  (measured in radians). Carry out the computations up to 5<sup>th</sup> stage.

6M

CO1

L1

b) Determine the cubic polynomial which takes the following values:

	0	1	2	3
$f(x)$	1	2	1	10

Hence calculate  $f(4)$ .

6M

CO1

L3

**OR**3. a) Find a real root of the equation  $x \log_{10} x = 1.2$  by regula-falsi method correct to four decimal places.

6M

CO1

L1

b) Use Lagrange's interpolation method. Determine the value of  $y$  when  $x = 10$ , if the following values of  $x$  and  $y$  are given:

$x$	5	6	9	11
$y$	12	13	14	16

6M

CO1

L3

**UNIT-II**4. a) Solve  $\int_0^1 \frac{dx}{1+x^2}$  by using Trapezoidal rule.

6M

CO2

L3

- b) Solve  $\frac{dy}{dx} = \log(xy)$  for  $y(1) = 1$  and  $y(2) = 2$ , by using Taylor's series method. 6M CO2 L3

OR

5. a) Use Simpson's 1/3 rule to find  $\int_0^1 e^{-x^2} dx$  by taking seven ordinates. 6M CO2 L1  
 b) Use Simpson's 1/3 rule and Euler's method, determine  $y(1)$  and  $y(2)$  given  $y' = y + e^x$ ,  $y(0) = 0$ . 6M CO2 L3

## UNIT-III

6. Determine mean, median and standard deviation for the following distribution:

Mid Value	15	20	25	30	35	40	45	50	55
Frequency	2	22	19	14	3	4	6	1	1

12M CO3 L3

OR

7. Determine the correlation coefficient for the following data:

X	1	2	3	4	5
Y	2	5	3	8	7

12M CO3 L3

## UNIT-IV

8. A box I contains four tickets numbered 1, 2, 3, 4 and another box II contains six tickets numbered 2, 4, 6, 7, 8, and 9. If one of the two boxes is chosen at random and a ticket is drawn at random from the chosen box, find the probabilities that the ticket drawn is numbered (i) 2 or 4 (ii) 3 (iii) 1 or 9. 12M CO4 L2

OR

9. Suppose a continuous R.V.  $x$  has the probability density function  $f(x) = \begin{cases} k(1-x^2) & \text{for } 0 < x < 1 \\ 0 & \text{elsewhere} \end{cases}$   
 (a) Find  $k$  (b) Find  $P(0.1 < x < 0.2)$  (c)  $P(x > 0.5)$  Using distribution function, determine the probabilities that (d)  $x$  is less than 0.3 (e) between 0.4 and 0.6 (f) Calculate mean and variance for the probability density function. 12M CO4 L2

## UNIT-V

10. a) The probability that a pen manufactured by a company will be defective is 0.1. If 12 such pens are examined, determine the probability that (a) exactly two (b) at least two will be defective. 6M CO5 L3  
 b) Determine the probability  $p$  that there are 3 defective items in a sample of 100 items if 2% of items made in this factory are defective. 6M CO5 L3

OR

11. A university awards distinction, first class, second class, third class or pass class according as the student gets 80% or more; 60% or more; between 45% and 60%; between 30% and 45%; or 30% or more marks respectively. If 5% obtained distinction and 10% failed, determine the percentage of students getting second class. Assume that marks  $X$  are normally distributed. 12M CO5 L3

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

Hall Ticket Number :

R-20

Code: 20A242T

II B.Tech. II Semester Supplementary Examinations Dec 2022 / Jan 2023

**Electrical and Electronics Measurements**

(Electrical and Electronics 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 mark**.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	Blooms Level
a) How dynamometer instrument can be realized as a transfer instrument?	1	1
b) How will you test the single phase energy meter?	2	1
c) List out the limitations of AC potentiometers.	3	1
d) Why is the Wheatstone bridge not suitable for measuring low resistance?	4	2
e) What is a digital voltmeter? What are various types of DVM?	5	1

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

Marks CO Blooms Level

**UNIT-I**

2. Explain the principle of operation of attraction type moving iron instrument, showing how it is suitable for ac and dc measurements. 12M 1 2

**OR**

3. Explain the working of electrostatic instruments with neat sketch. Derive an expression for Deflecting Torque. 12M 1 2

**UNIT-II**

4. Explain with a neat circuit of Dynamometer type Wattmeter and derive the equation for deflection. 12M 2 2

**OR**

5. Describe the working of a single phase electrodynamic power factor meter. Compare its working with a moving iron type power factor meter. 12M 2 4

**UNIT-III**

6. Draw a connection diagram of Crompton potentiometer and bring out its salient features. How is it standardised? 12M 3 3

**OR**

7. What are the problems associated with ac potentiometer? Describe the working of any one ac potentiometer with neat sketch. 12M 3 2

**UNIT-IV**

8. Describe the circuit of Kelvin double bridge used for measurement of low resistance. Derive the conditions for balance. 12M 4 4

**OR**

9. Explain the procedure of measuring a low resistance with the help of Kelvin's double bridge. Derive the necessary relation for finding the unknown resistance under balanced condition of the bridge. 12M 4 2

**UNIT-V**

10. Draw and explain the circuit of a digital frequency meter. What are the different methods used for high frequency determination? 12M 5 3

**OR**

11. Explain the following with neat sketch:  
 (a) Integrating type DVM.  
 (b) Digital multimeter 12M 5 2

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

Hall Ticket Number :

R-20

Code: 20A243T

II B.Tech. II Semester Supplementary Examinations Dec 2022 / Jan 2023

**Electromagnetic Fields**

(Electrical and Electronics 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 mark**.3. Answer **ALL** the questions in **Part-A** and **Part-B****PART-A**

(Compulsory question)

- |                                                                                         | CO  | Blooms Level |
|-----------------------------------------------------------------------------------------|-----|--------------|
| 1. <b>Answer ALL the following short answer questions</b> ( 5 X 2 = 10M )               |     |              |
| a) Define electric field and write its properties.                                      | CO1 | L1           |
| b) Write the expression for electric potential due to dipole.                           | CO1 | L1           |
| c) Deduce the expressions for H and B of toroid.                                        | CO2 | L1           |
| d) What does Lorentz force equation specify?                                            | CO3 | L1           |
| e) Express the relation between displacement current density and electric flux density. | CO4 | L1           |

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

- |                                                                                                                                                                                                                                                                                                  | Marks | CO  | Blooms Level |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|--------------|
| <b>UNIT-I</b>                                                                                                                                                                                                                                                                                    |       |     |              |
| 2. a) Three equal positive charges of $4 \times 10^{-9}$ coulomb each are located at three corners of a square, side 20cm. determine the electric field intensity at the vacant corner point of the square.                                                                                      | 6M    | CO1 | L4           |
| b) Determine the electric field intensity due to infinite line charge, at a point perpendicular to its plane and at a given distance from the line charge from first principles.                                                                                                                 | 6M    | CO1 | L1           |
| <b>OR</b>                                                                                                                                                                                                                                                                                        |       |     |              |
| 3. a) What is Gauss's law? State and prove it.                                                                                                                                                                                                                                                   | 6M    | CO2 | L1           |
| b) A square sheet defined by $-2 \leq x \leq 2$ m, $-2 \leq y \leq 2$ m lies in the $z = -2$ m plane. The charge density on the sheet is $\rho_s = (x^2 + y^2 + z^2)^{3/2}$ nC /m <sup>2</sup> . Calculate the electric field intensity at the origin.                                           | 6M    | CO2 | L3           |
| <b>UNIT-II</b>                                                                                                                                                                                                                                                                                   |       |     |              |
| 4. a) Describe the Laplace and Poisson's equations for electrostatic fields.                                                                                                                                                                                                                     | 6M    | CO2 | L1           |
| b) A square parallel plate capacitor 200 mm on side with a plate spacing of 25 mm is filled with a dielectric slab ( $\epsilon_r = 240$ of the same dimensions if 100V is applied to the capacitor). Find: (i) the polarization P in the dielectric and (ii) the energy stored by the capacitor. | 6M    | CO2 | L3           |
| <b>OR</b>                                                                                                                                                                                                                                                                                        |       |     |              |
| 5. a) Deduce the expression for potential due to dipole.                                                                                                                                                                                                                                         | 6M    | CO2 | L2           |
| b) Define polarization. Derive the mathematical expression for polarization.                                                                                                                                                                                                                     | 6M    | CO2 | L2           |

UNIT-III
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- |       |                                                                                                                                                                         |    |     |    |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|----|
| 6. a) | Calculate the inductance of a solenoid of 200 turns wound tightly on a cylindrical tube of 6cm diameter. The length of the tube is 60cm and the solenoid is in the air. | 6M | CO2 | L3 |
| b)    | Enumerate scalar magnetic potential and list out its limitations.                                                                                                       | 6M | CO2 | L1 |

OR

- |       |                                                                                                                 |    |     |    |
|-------|-----------------------------------------------------------------------------------------------------------------|----|-----|----|
| 7. a) | Derive the Maxwell's third equation and explain its importance.                                                 | 6M | CO2 | L2 |
| b)    | Using Ampere's circuital law, find the expression for magnetic field intensity of an infinite sheet of current. | 6M | CO2 | L2 |

UNIT-IV
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- |       |                                                                                                                                                                                                                                 |    |     |    |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|----|
| 8. a) | Deduce the expression for Lorentz force equation                                                                                                                                                                                | 6M | CO3 | L1 |
| b)    | Two coils A and B with 800 turns and 1200 turns respectively, have a common magnetic circuit. A current of 0.5A in A will produce a flux of 3mwb and 80% of the flux links with coil B. Calculate self-inductance of each coil. | 6M | CO3 | L4 |

OR

- |       |                                                                                                                                                                                                                                                                                                                                                                                                            |    |     |    |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|----|
| 9. a) | Illustrate the phenomenon of Magnetization in magnetic materials.                                                                                                                                                                                                                                                                                                                                          | 6M | CO3 | L2 |
| b)    | A toroidal coil of 500 turns is wound on a steel ring of 0.5m. Mean diameter and $2 \times 10^{-2} \text{ m}^2$ cross sectional area. An excitation of 4000A/m produces a flux density of 1 tesla. Compute the inductance of the coil. If a 10mm long gap is cut in the ring, determine the current required to maintain the flux density at 1 tesla. Also find the inductance under these new conditions. | 6M | CO3 | L4 |

UNIT-V
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- |        |                                                                                                                                                                                                                                            |    |     |    |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|----|
| 10. a) | Briefly explain the Faraday's law of electro-magnetic induction and derive the expression for induced emf.                                                                                                                                 | 6M | CO4 | L2 |
| b)     | A square loop of wire 25cm * 25cm is placed in an alternating field with the maximum intensity of 1A/m. If the plane of the loop is perpendicular to the magnetic field and varying at a frequency of 10MHz. Find induced emf in the loop. | 6M | CO4 | L4 |

OR

- |        |                                                                         |    |     |    |
|--------|-------------------------------------------------------------------------|----|-----|----|
| 11. a) | Write and explain differential and integral form of Maxwell's equation. | 6M | CO4 | L2 |
| b)     | Explain the complete concept of displacement currents.                  | 6M | CO4 | L3 |

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