Roll No.											

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 05-12-2025 **Time:** 01:00pm – 04:00pm

School: COMMON TO ALL SCHOOL	**Program:** COMMON TO ALL PROGRAM	
Course Code: MAT3043	**Course Name:** Financial Mathematics	
Semester: OE	**Max Marks**:100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**12**	**14**	**24**	**24**	**26**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	Find the value of y in the given expression $8\text{y}{-}6y + 4y = 144 - 6y$.	**2 Marks**	**L1**	**CO1**
2.	The list price of a Cuisinart food processor is $298.80, and the trade discount is 25%. Find the net cost.	**2 Marks**	**L1**	**CO2**
3.	A real estate broker charges a 6, commission. Find the commission on a house selling for $268,500.	**2 Marks**	**L1**	**CO2**
4.	Find the interest on a loan of $85, 000 for 9 months at 18.5%.	**2 Marks**	**L1**	**CO3**
5.	Find the interest rate per compounding period and the number of compounding periods for 5% compounded semiannually and 3 years.	**2 Marks**	**L1**	**CO3**
6.	Define an ordinary annuity.	**2 Marks**	**L2**	**CO4**
7.	Find the future value after 2 years of an immediate annuity of Rs. 5000, the rate of interest being 6% p.a compounded annually.	**2 Marks**	**L1**	**CO4**
8.	Define the ordinary dating method of cash discount is expressed on an invoice as 2/10, n/30.	**2 Marks**	**L2**	**CO5**

9.	Find the mean marks of 22, 30, 36, 12, 15, 25, 18, 10, 33, 29.	**2 Marks**	**L1**	**CO5**
10.	Find the profit function if the fixed costs is Rs. 850, variable cost per item is Rs. 45, and selling price per unit is Rs. 65.	**2 Marks**	**L1**	**CO5**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	A merchant instructs his agent to buy 1,000 micro tip pens and sell them at 15% above the purchase price. The agent charges 1% commission on the purchase and 3% commission on sales and earns Rs. 534/- as commission. Find the price at which the agent buys the pen.	**10 Marks**	**L3**	**CO1**
Or					
12.	**a.**	A salesman is paid a monthly salary plus a commission based as a percentage on sale. If on the sales of Rs. 20,000/- and Rs.25,000/- in two successive months he received Rs. 1600/- and Rs.1750/- respectively, find his monthly salary and the rate of commission paid on sales.	**10 Marks**	**L3**	**CO1**

13.	**a.**	The retail price of a 50-inch portable basketball system is \$549.99. The retailer has operating expenses of 29.5 %, and wants a 5.5 % profit, both based on cost, on this item. First find the total percent of markup on cost; then find cost and markup.	**10 Marks**	**L3**	**CO2**
Or					
14.	**a.**	Find the markup and the selling price for an Adidas hooded sweatshirt if the cost is \$23.60 and the markup is 45%, of cost.	**10 Marks**	**L3**	**CO2**

15.	**a.**	Brianna McGruder and Tanya Zoban own Extreme Sports, Inc., whose value is \$120,000 today assuming normal growth. However, the partners believe the value will grow at 15, per year for the next four years. They want to take this rapid growth into consideration when valuing the business for a potential sale. (i) Find the future value of the business in 4 years. (ii) Estimate the value of the retail store by finding the present value of the amount found in part (i) at 6% compounded quarterly.	**10 Marks**	**L3**	**CO3**
Or					

16.	**a.**	An investment managed by Bank of America pays 7%, interest per year compounded semiannually. Given an initial deposit of $4500, (a) use the formula to find the compound amount after 5 years, and (b) find the compound interest.	**10 Marks**	L3	CO3

17.	**a.**	If the nominal rate of interest stated is $\mathbf{7\frac{1}{2}}$ %, what would the effective interest rate be if the compounding occurs annually, semi-annually, quarterly, monthly, weekly, and daily?	**10 Marks**	L3	CO3
		Or			
18.	**a.**	You decide to put $12,000 in a money market fund that pays interest at the annual rate of 8.4%, compounding it monthly. You plan to take the money out after one year and pay the income tax on the interest earned. You are in the 15% tax bracket. Find the total amount available to you after taxes.	**10 Marks**	L3	CO3

19.	**a.**	Find the future value of an immediate annuity after 3 years with the periodic payment of Rs. 12000 at 5% p.a. if the period of payments is (i) yearly, (ii) half-yearly, (iii) quarterly and (iv) monthly.	**10 Marks**	L3	CO4
		Or			
20.	**a.**	On August 14, Dr. Jane Ficker signed a 180-day note for $28,500 for a used x-ray machine for her dental office. The note has an interest rate of 10, compounded annually. On October 25, a payment of $8500 is made. (a) Find the balance owed on the principal after the payment. (b) If no additional payments are made, find the amount due at maturity of the loan.	**10 Marks**	L3	CO4

21.	**a.**	Tim and Cathy will need a down payment of $15,000 for their first home. If they can save $600 at the beginning of each month in an account bearing $\mathbf{8\frac{1}{2}}$% compounded monthly, determine how long it would take them to buy a home.	**10 Marks**	L3	CO4
		Or			
22.	**a.**	Samantha is planning to buy a new car for $17,000 upon her graduation 5 years from now. She is investing in an ordinary annuity account paying 7% interest compounded monthly. How much should she be depositing each month?	**10 Marks**	L3	CO4

<table>
<tr><td>23.</td><td>a.</td><td>From the following frequency distribution, find the standard deviation using the formula for grouped data:
<table>
<tr><td>Class Interval</td><td>Frequency</td></tr>
<tr><td>10 - 20</td><td>9</td></tr>
<tr><td>20 - 30</td><td>18</td></tr>
<tr><td>30 - 40</td><td>31</td></tr>
<tr><td>40 - 50</td><td>17</td></tr>
<tr><td>50 - 60</td><td>16</td></tr>
<tr><td>60 - 70</td><td>9</td></tr>
</table></td><td>10 Marks</td><td>L3</td><td>CO5</td></tr>
<tr><td colspan="6">Or</td></tr>
<tr><td>24.</td><td>a.</td><td>Compute the standard deviation for the following data.
<table>
<tr><td>x</td><td>100</td><td>102</td><td>104</td><td>106</td><td>108</td><td>110</td><td>112</td></tr>
<tr><td>f</td><td>5</td><td>11</td><td>7</td><td>9</td><td>13</td><td>10</td><td>12</td></tr>
</table></td><td>10 Marks</td><td>L3</td><td>CO5</td></tr>
</table>

<table>
<tr><td>25.</td><td>a.</td><td>From the following frequency distribution, find the standard deviation using the formula for g
data:
<table>
<tr><td>Class Interval</td><td>Frequency</td></tr>
<tr><td>0 - 10</td><td>5</td></tr>
<tr><td>10 - 20</td><td>10</td></tr>
<tr><td>20 - 30</td><td>15</td></tr>
<tr><td>30 - 40</td><td>8</td></tr>
<tr><td>40 - 50</td><td>2</td></tr>
</table></td><td>10 Marks</td><td>L3</td><td>CO5</td></tr>
<tr><td colspan="6">Or</td></tr>
<tr><td>26.</td><td>a.</td><td>A company produces and sells a product and fixed costs of the company are Rs. 6,000 and variable cost is Rs. 25 per unit, and sells the product at Rs. 50 per unit.

(i) Find the total cost function.

(ii) Find the total revenue function.

(iii) Find the profit function, and determine the profit when 1000 units are sold.

(iv) How many units have to be produced and sold to yield a profit of Rs. 10,000?</td><td>10 Marks</td><td>L3</td><td>CO5</td></tr>
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