Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17MA2024** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BUSINESS MATHEMATICS** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
| **PART – A (5 X 2 = 10 MARKS)** | | | |
| 1. | Find the 8th term in the sequence 4, 7, 10,……. | CO1 | 2 |
| 2. | Find the time required to earn Rs. 400 as simple interest on the principal of Rs.2000 at the rate 10%. | CO2 | 2 |
| 3. | If and, then find A –B and 2A+3B. | CO3 | 2 |
| 4. | Find . | CO4 | 2 |
| 5. | What are the various types of solution of an L.P.P in graphical method? | CO6 | 2 |

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| **PART – B (3 X 10 = 30 MARKS)**  **(either or type)** | | | |
| 6. | The fourth and seventh terms of an A.P. are 3 and 36. Find the A.P. and its fifteenth term. | CO1 | 10 |
| **(OR)** | | | |
| 7. | The first three terms of a G.P. are *x*, *x*+3 and *x*+9. Find the value of x and the sum of the first eight terms. | CO1 | 10 |
|  | | | |
| 8. | Calculate compound interest and the amount for an investment of Rs.5000 for a period of 3 years @ 8% p.a., interest compounded;  (i) Annually (ii) half yearly (iii) Quarterly. | CO2 | 10 |
| **(OR)** | | | |
| 9. | Given ,, and . Prove that (i)  (ii)  (iii) . | CO3 | 10 |
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| 10. | Find the inverse of the matrix | CO3 | 10 |
| **(OR)** | | | |
| 11. | Find the derivative of (i) (ii) . | CO4 | 10 |

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|  | **PART – C (3 X 20 = 60 MARKS)**  **(Answer any three out of five)** | | | |
| 12. | a. | A man borrows Rs.1200 at the total interest of Rs.168. He repays the entire amount in 12 instalments, each instalment being less than the preceding one by Rs.20. Find the first instalment. | CO1 | 10 |
| b. | If the sum of 3 numbers in a G.P is 35 and their product is 1000. Find the three numbers. | CO1 | 10 |
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| 13. | a. | In a company a machine costs Rs. 80000 and its life is estimated to be 20 years. Sinking fund is created for replacing the machine at the end of its life time when its scrap realizes a sum of Rs. 5000 only. Calculate the amount which should be provided every year for the sinking fund if it accumulates at 9% p.a. compounded annually. | CO2 | 10 |
| b. | A bill of Rs.1825 was drawn on 22nd January at 6 months date and discounted on 16th April at the rate of 10% p.a. Find the sum for which the bill was discounted, bankers discount, true discount and bankers gain. | CO2 | 10 |
|  |  |  |  |  |
| 14. | a. | If and , show that . | CO3 | 10 |
| b. | A,B, and C have Rs.48, Rs.76 and Rs.71 respectively. They utilise these amounts to purchase 3 types of shares of price x,y and z respectively. A purchases 2 shares of price x, 5 of price y and 3 of price z. B purchases 4 shares of price x, 3 of price y and 6 of price z. C purchases 1 share of price x, 4 of price of y and 10 of price z. Find x,y and z. | CO3 | 10 |
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| 15. | a. | Find the maximum and minimum value of the function . | CO4 | 10 |
| b. | Integrate (i)  and (ii) with respect to x. | CO4 | 10 |
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| 16. | a. | A company makes three products X, Y and Z which pass through three departments: Drill, Lathe and Assembly. The hours available in each department, hours required by each product in each department and profit contribution of each product are given below:   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Product** | **Time required in hours** | | | **Profit per Unit (**Rs**)** | | **Drill** | **Lathe** | **Assembly** | | X | 3 | 3 | 8 | 9 | | Y | 6 | 5 | 10 | 15 | | Z | 7 | 4 | 12 | 20 | | Hours Available | 210 | 240 | 260 |  |   Formulate the above as an L.P.P. | CO5 | 10 |
| b. | Solve the following L.P.P. graphically  Minimize  subject to    and . | CO6 | 10 |