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Total No. of Printed Pages: 2

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**B. Com (Hons.) (Semester – 1<sup>st</sup>)**

**BUSINESS MATHEMATICS**

**Subject Code: BMAT0111**

**Paper ID: 140104**

**Time: 03 Hours**

**Maximum Marks: 60**

**Instruction for candidates:**

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

**Section – A**

**(2 marks each)**

Q1. Attempt the following:

- a. Find the 6<sup>th</sup> term of the G.P. series: 5, 10, 20, 40, ...
- b. The common difference of an A.P. is 3 and the 15<sup>th</sup> term is 37. Find the first term.
- c. Find the amount on Rs. 5000 in 2 years at 5% per annum compounded annually.
- d. Write the formula for the simple interest and amount.
- e. The value of a T.V set which was purchased 2 years ago, depreciates at 12% per annum. If its present value is Rs. 9680, for how much was it purchased.
- f. Define symmetric and skew-symmetric matrices.
- g. Calculate the determinant of  $\begin{vmatrix} 2 & -1 & 3 \\ 1 & 3 & 1 \end{vmatrix}$ .
- h. A shopkeeper buys an article for Rs. 360 and sells it for Rs. 270. Find his gain or loss percent.
- i. A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. Find the sum.
- j. Find the adjoint of the matrix  $A = \begin{bmatrix} 1 & 2 & 3 \\ -1 & & \end{bmatrix}$

**Section – B**

**(5 marks each)**

- Q2. Find the sum of the first 35 terms of an A.P., in which second term is 2 and seventh term is 22.
- Q3. Find the compound interest on Rs. 40960 for  $1\frac{1}{2}$  years at 12.5% per annum compounded semi-annually.
- Q4. Three shopkeepers A, B and C go to a store to buy stationery. A purchase 12 dozen note-books, 5 dozen pens and 6 dozen pencils. B purchase 10 dozen note-books, 6 dozen pens and 7 dozen pencils. C purchase 11 dozen notebooks, 13 dozen pens and 8 dozen pencils. A note book costs 40 paise, a pen costs Rs. 1-25 and a pencil costs 35 paise. Calculate each individual's bill.
- Q5. Find the inverse of the matrix  $A = \begin{bmatrix} 1 & 2 & -2 & -1 & 3 & 0 & 1 & -2 & 1 \end{bmatrix}$ .
- Q6. Find the value of  $\begin{vmatrix} 1 & a & b & + & c & 1 & b & c & + & a & 1 & c & a & + & b \end{vmatrix}$ .

**Section – C**

**(10 marks each)**

- Q7. Find the sum of the following series:  $5 + 55 + 555 + 5555 + \dots$  to  $n$  terms
- Q8. Hari Ram purchased Rahat Patras for Rs 1000. After 5 years he got Rs 2000. Find the rate of interest if the interest is compounded half-yearly. Given that  $2^{\frac{1}{10}} = 1.072$

Q9. Solve the following system of equations by Cramer's rule.

$$2x_1 - x_2 + 3x_3 = 9$$

$$x_2 - x_3 = -1$$

$$x_1 + x_2 - x_3 = 0$$