



‘সমানো মন্ত্র: সমিতি: সমানী’

UNIVERSITY OF NORTH BENGAL
BBA LL.B. Honours 3rd Semester Examination, 2023

BUSINESS MATHEMATICS

PAPER CODE: FC07

Time Allotted: 3 Hours

Full Marks: 100

The figures in the margin indicate full marks.

Answer Question No. 7 and any four questions from the following

1. (a) Dave borrows Rs. 1,500 to repair his house. He will pay off the loan after 3 years by paying back the principal plus 3.5% interest for each year. How much will he pay in interest, and how much will he pay back all together? 10
- (b) A bank lends Rs. 4,000 on loan to a businessman in simple interest. If he promises to pay Rs. 200 every month for a period of two years. What is the interest rate on the loan per annum? 10
2. (a) A Television was bought for Rs. 21,000. The value of the Television was depreciated by 5% per annum. Find the value of the Television after 3 years. 10
- (b) The population of a place increased to 54,000 in 2003 at a rate of 5% per annum: 5+5
 - (i) Find the population in 2001.
 - (ii) What would be its population in 2005?
3. (a) Prove that for the Matrices A and B , $(A+B)^2 \neq A^2 + 2AB + B^2$, where 10

$$A = \begin{bmatrix} 1 & 0 \\ 2 & 3 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 1 \\ -1 & 2 \end{bmatrix}$$
- (b) Find the value of $A^2 + 2ABC + B^2 + 2C^2$, where 10

$$A = \begin{bmatrix} 6 & 7 & 9 \\ 9 & 2 & 10 \\ 5 & 4 & 7 \end{bmatrix}, B = \begin{bmatrix} 11 & 6 & 8 \\ 10 & 7 & 2 \\ 4 & 9 & 6 \end{bmatrix} \text{ and } C = \begin{bmatrix} 12 & 6 & 2 \\ 13 & 5 & 4 \\ 11 & 7 & 13 \end{bmatrix}$$
4. (a) There are 5 green and 7 red balls. Two balls are selected one by one without replacement. Find the probability that first is green and second is red. 10
- (b) 1 card is drawn at random from the pack of 52 cards: 10
 - (i) Find the probability that it is an honor card.
 - (ii) It is a face card.

5. (a) In a group, the ratio of doctors to lawyers is 5:4. If the total number of people in the group is 72. What is the number of lawyers in the group? 10
- (b) In a bag, there are certain number of toy-blocks with alphabets A, B, C and D written on them. The ratio of blocks A:B:C:D is in the ratio 4:7:3:1. If the number of 'A' blocks is 50 more than the number of 'C' blocks, what is the number of 'B' blocks? 10
6. (a) Perform the indicated function evaluation for $f(x) = 3 - 5x - 2x^2$, where $2\frac{1}{2} \times 4 = 10$
- (i) $f(4)$
- (ii) $f(-3)$
- (iii) $f(0)$
- (iv) $f(x+h)$
- (b) Perform the indicated function evaluation for $g(t) = \frac{t}{2t+6}$, where, $2\frac{1}{2} \times 4 = 10$
- (i) $g(0)$
- (ii) $g(-3)$
- (iii) $g(x^2)$
- (iv) $g(10)$
7. Write short notes: (Attempt any **four**) $5 \times 4 = 20$
- (a) Difference between Simple interest and Compound interest
- (b) Importance of Derivatives in Economics
- (c) Properties of Multiplication of Matrices
- (d) Concept of Differentiation
- (e) Concept of Integration
- (f) Equated monthly installment.

— x —