



MBD-161100010103

Seat No. _____

B. B. A. (Sem. I) (CBCS) Examination

November / December – 2016

Elements of Business Mathematics

(New Course)

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) Attempt all the questions.
 (2) Figures to the right side indicate marks of each question.

- 1 (a) Prove that $nP_r = n(n-1)(n-2) \dots (n-r+1)$ **7**
 (b) In how many ways 8 papers of an examination can be arranged so that two Maths papers never come together ? **7**

OR

- 1 (a) Prove that $nC_r + nC_{r-1} = (n+1)C_r$ **7**
 (b) Find the value of n and r . **7**
 $nC_{r-1} : nC_r : nC_{r+1} = 3 : 4 : 5$

- 2 (a) Prove that $S_n = \frac{n}{2}(2a + (n-1)d)$ **7**
 (b) Find T_{15} and S_{15} . **7**

$$\frac{a+b}{a+b} + \frac{a+3b}{a+b} + \frac{a+5b}{a+b} + \dots$$

OR

- 2 (a) Prove that $AH = G^2, A \geq G \geq H$ **7**
 (b) Find the sum of n terms of the series **7**
 $11+103+1005+\dots$

- 3 (a) Find the middle terms in the expansion of $\left(3x - \frac{x^3}{6}\right)^9$. **7**
 (b) If 21st and 22nd terms in the expansion of $(1+x)^{44}$ are equal. Find the value of x . **7**

OR

- 3 (a) Find the term independent of x in the expansion of 7

$$\left(2x + \frac{1}{3x^2}\right)^9.$$

- (b) Find the value $(\sqrt{2}+1)^6 + (\sqrt{2}-1)^6$. 7

- 4 (a) Explain : Newton's forward method. 7

- (b) Use Lagrange's method, find $f(6)$ 7

$$f(3)=168, f(7)=120, f(9)=72, f(10)=63$$

OR

- 4 Find the missing values : 14

$x:$	1977	1982	1987	1992	1997	2002
$y:$	7	—	13	15	—	25

- 5 (a) Using Mathematical Induction Principle prove that 7

$$1^3 + 2^3 + 3^3 + \dots + n^3 = \frac{n^2(n+1)^2}{4}$$

- (b) Find the sum of n terms of series : 7

$$3 \times 8 + 5 \times 11 + 7 \times 14 + \dots$$

OR

- 5 (a) Using Mathematical Induction Principle prove that 7

$$1 \times 2 + 2 \times 3 + 3 \times 4 + \dots + n(n+1) = \frac{n(n+1)(n+2)}{3}$$

- (b) Find the sum of : 7

$$(1) \quad 10^2 + 11^2 + \dots + 20^2$$

$$(2) \quad \sum_{n=1}^{10} (5n-1)^2.$$
