



HDG-161100010103 Seat No. _____

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

November/December – 2017

**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 indicate marks of each question.

1 (a) Prove that $\frac{1}{(n-1)!} + \frac{1}{(n-2)!} = \frac{n^2}{n!}$. 7

- (b) In Party A there are 6 members and in Party B 4 members. How many ways a committee of 5 members can be formed so that the members of Party A are always in majority ? 7

OR

1 (a) Prove that $nC_r = \frac{n!}{r!(n-r)!}$. 7

- (b) How many four different numbers greater than 7500 can be formed from the digits 3, 5, 7, 8, 9 using each digit once only ? How many numbers are less than 5000 ? 7

2 (a) Prove that $S_n = \frac{a(1-r^n)}{1-r}$. 7

- (b) Find five numbers in G.P. whose product is 32 and the product of the last two numbers is 108. 7

OR

- 2 (a) Prove that 7

$$AH = G^2 \text{ and } A > G > H$$

- (b) Find the sum of numbers between 200 and 400 7
exactly divisible by 7.
- 3 (a) Explain : Newton's Backward Method. 7
- (b) Interpolate the missing value in the following table. 7

Year	1996	1998	2000	2002	2004
Production of bulbs No.s	148	157	-	181	202

OR

- 3 (a) Explain : Importance and uses of Interpolation 7
and Extrapolation.
- (b) To find the value of y when $x = 10$ 7

$x :$	5	6	9	11
$y :$	12	13	14	16

- 4 (a) If K is a real numbers and if the middle term in the 7
expansion of $\left(\frac{K}{2} + 2\right)^8$ is 1120. Find K .

- (b) Find the middle terms in the expansion of $\left(2x^2 - \frac{1}{x}\right)^7$. 7

OR

- 4 (a) Obtain the coefficient of x^{16} in the expansion of 7
 $(2x^2 - x)^{10}$.

- (b) Find the value of $(\sqrt{2} + 1)^5 + (\sqrt{2} - 1)^5$. 7

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

$$1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$$

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

$$1 \times 5 + 2 \times 6 + 3 \times 7 + \dots$$

OR

- 5 (a) Prove the following results by the principle of Mathematical Induction. 7

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

- (b) (1) Find the value of $\sum_{n=1}^{35} (4n - 5)$. 3

- (2) Find the value of $\sum_{n=11}^{20} n^2$. 4
