



**DCY-161100010103**

Seat No. \_\_\_\_\_

**B.B.A. (Sem. I) (CBCS) (Sem. I) (W.E.F. 2016) Examination**

**August – 2022**

**Elements of Business Mathematics**

*(Old Course)*

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

[ Total Marks : 70

- Instructions :** (i) Attempt any five questions.  
(ii) Each question carries equal marks.

- 1 (a) Define combination and prove that  ${}^nC_r + {}^nC_{r+1} = {}^{n+1}C_{r+1}$ . 7  
(b) A bag contains 4 white and 6 black balls. In how many ways selection of 2 balls can be made so that 7  
(i) Both are white balls  
(ii) Both are black balls  
(iii) Both are of different colour
- 2 (a) Prove that  ${}^nP_r = \frac{n!}{(n-r)!}$ ,  $r \leq n$ . 7  
(b) How many different words using all the letters of the word 'COMPUTER' can be formed ? How many of them 7  
(i) begin with C  
(ii) begin with C and end with R
- 3 (a) Prove that  $S_n = \frac{n}{2}[2a + (n-1)d]$ . 7  
(b) The 13<sup>th</sup> term of an A.P. is 55. Find the sum of its first 25 terms. 7
- 4 (a) Obtain the sum of  $n$  terms of the series  $5+55+555+\dots$  7  
(b) Find three numbers in G.P. whose sum is 14 and the product is 64. 7

- 5 (a) State binomial theorem and give its properties. 7
- (b) Expand :  $\left(2x - \frac{3}{y}\right)^5$ . 7
- 6 (a) Find the value of  $(\sqrt{2}+1)^6 + (\sqrt{2}-1)^6$ . 7
- (b) Find the middle term in the expansion of  $\left(x + \frac{1}{x}\right)^{10}$ . 7
- 7 (a) Using the principle of Mathematical Induction prove that 7
- $$1+2+3+\dots+n = \frac{n(n+1)}{2}.$$
- (b) Find the sum of 7
- (i)  $11+12+\dots+20$
- (ii)  $21^2+22^2+\dots+30^2$
- 8 (a) Using the principle of M.I. prove that 7
- $$1(5)+2(6)+\dots+n(n+4) = \frac{n(n+1)(2n+13)}{6}.$$
- (b) Find  $S_n$  if  $T_n = n(n+2)$ . 7
- 9 (a) Explain : Interpolation and Extrapolation. 7
- (b) Using appropriate method of interpolation find missing value. 7

$x:$	10	20	30	40	50
$y:$	1	4	—	16	25

- 10 From the following data, using Lagrange's method estimate value of  $y$  when  $x = 2$ . 14

$x:$	0	1	3
$y:$	1	4	28