



JAT-161100010103

Seat No. _____

B. B. A. (Sem. I) (C.B.C.S.) (W.E.F. 2016) Examination

December - 2019

Elements of Business Mathematics

(New Course)

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

[Total Marks : 70

- Instructions :** (1) Attempt all questions.
(2) Each question carries equal marks.

- 1 (a) Explain the meaning of permutations and prove that 7

$${}_n P_r = \frac{n!}{(n-r)!}$$

- (b) If all the permutations of the word "VRUNDA" be 7
written down as in dictionary what is the rank of the
word "VRUNDA" ?

OR

- 1 (a) In usual notations prove that 7

$${}_n C_r = {}_n C_{r-1} = {}_{n+1} C_r$$

- (b) A box contains 7 red, 6 white and 4 blue balls. In 7
how many ways selection of 3 balls can be made so
that
(i) All 3 balls are red balls.
(ii) None is a red ball.
(iii) There is one ball of each colour.

- 2 (a) Define Arithmetic progression and derive the formula 7
for finding n^{th} term and sum of n terms of Arithmetic
progression.

- (b) The sum of five numbers in A.P. is 30 and the 7
product of the first and the last is 20. Find the
numbers.

OR

- 2 (a) Prove that for any two real numbers 7
 $A. M. \geq G. M. \geq H. M.$

- (b) Insert 4 geometric means between $\frac{1}{2}$ and 512. 7

- 3 (a) State Binomial theorem and give its characteristics. 7
 (b) Obtain the middle terms of $\left(\frac{x}{3} - \frac{3}{x}\right)^5$. 7

OR

- 3 (a) Find the value of $(\sqrt{5}+1)^5 - (\sqrt{5}-1)^5$. 7
 (b) If the coefficient of x in the expansion of $\left(x^2 + \frac{k}{x}\right)^5$ is 270, find the value of k . 7
- 4 (a) What do you mean by Interpolation and Extrapolation? State their assumptions and importance. 7
 (b) If $f(0)=2$, $f(2)=6$, $f(3)=10$, then by using Lagrange's method derive the formula of $f(x)$ and hence obtain $f(5)$. 7

OR

- 4 Estimate the missing values from the following data : 14

x	0	5	10	15	20	25
y	7	11	?	18	?	32

- 5 (a) By applying principle of Mathematical Induction prove that 7

$$1+2+3+4+\dots+n = \frac{n(n+1)}{2}$$
 (b) Find the sum of the following series 7
 $11^2 + 12^2 + 13^2 + \dots + 20^2$.

OR

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

$$1^3 + 2^3 + 3^3 + \dots + n^3 = \frac{n^2(n+1)^2}{4}$$
 (b) Find the value of : $\sum_{i=10}^{20} i^3$ 7