

B.B.A. Semester - 1 (CBCS) Examination**Nov./Dec. -2018 (Old Course)****ELEMENTS OF BUSINESS MATHEMATICS (ELECTIVE)****Time: 2:30 Hours****Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

- Que-1 (A) How many different words using all the letters of the word VISHANT can be formed? (05)
How many of them (i) begin with 'V' (ii) begin with 'V' and end with 'T' (iii) vowels are always together?
- (B) How many numbers greater than a million can be formed with digits 8, 7, 7, 0, 8, 7, 4? (05)
How many of them are odd numbers?
- (C) Prove that $9p^3 + 3(9p^3) = 10p^3$ (04)
- OR
- Que-1 (A) How many ways can a person invite his five friends by sending invitation to one or more at a time? (05)
- (B) A board of directors of a company shall consists of 10 members. 6 belongs to the independent and 4 to the whole time employee. In how many ways can a committee of 5 be selected so that the members of the independent directions are in majority? (05)
- (C) If $2nc^3 : nc^2 = 44:3$ find n (05)
- Que-2 (A) Find value of $(\sqrt{5} + \sqrt{3})^6 + \sqrt{5} - \sqrt{3})^6$ (05)
- (B) The first three terms in the expansion of $(a+b)^n$ are 1,14 and 84 then determine a, b, n (05)
- (C) Find fourth term in the expansion of $(3x - \frac{1}{2})^7$ (04)
- OR
- Que-2 (A) Find middle term in the expansion of $(x - \frac{1}{x})^{11}$ (05)
- (B) Find the term independent of X in the expansion of $(x + \frac{1}{x})^{10}$ (05)
- (C) Prove that there is no term involving x^8 in the expansion of $(5x^2 - \frac{8}{x})^{11}$ (04)
- Que-3 (A) In usual notation prove that $\sum n^2 = n(n+1)(n+2)/6$ (05)
- (B) Prove using principal of mathematical induction (05)
- $$1 + 4 + 7 + \dots + (3n-2) = \frac{1}{2} (n) (3n-1)$$
- (C) Using principal of mathematical induction prove that $(2^{3n}-1)$ is divisible by 7. (04)
- OR
- Que-3 (A) In usual notation prove that $\sum n = n(n+1)/2$ (05)
- (B) Using principal of mathematical induction prove that $5^{2n}-1$ is divisible by 24. (05)
- (C) If $T_n = 2n^2 + 3n$ then find S_n . (04)
- Que-4 (A) Define AP and write formula of sum of n terms of AP and prove it. (05)

(B) If 7, X, Y, Z, 112 are the first five terms of G.P. Find values of X, Y, Z (05)

(C) If S_1, S_2, S_3 are the sums of $n, 2n, 3n$ terms of an A.P. prove that $S_3 = 3(S_2 - S_1)$ (04)

OR

Que-4 (A) Define G.P. and write formula of sum of n terms and prove it. (05)

(B) Find sum of numbers between 200 and 400 exactly divisible by 7 (05)

(C) If $a - b, b - c, c - a$ are in G.P. prove that $(a + b + c)^2 = 3(ab + bc + ca)$ (04)

Que-5 (A) Explain meaning of interpolation and extrapolation. (05)

(B) Apply Newton's backward formula for finding out the number of students who obtained marks 36 or more but less than 40. (05)

Marks less than	20	25	30	35	40
No. of students	20	45	115	210	225

(C) If $f(0) = 2, f(2) = 6, f(3) = 10$ using appropriate formula find $f(5)$ (04)

OR

Que-5 (A) Give assumption of interpolation and extrapolation (05)

(B) Estimate the % of Students who obtained less than 35 marks by using Lagrange's method. (05)

Marks	25	30	40	50
% of students	52	67.3	84.1	94.4

(C) Estimate missing values (04)

Year	1965	1966	1967	1968	1969	1970
Sales (in "000")	10	15	?	20	?	30
