

B.B.A. Semester - 1 (CBCS) Examination**Oct/Nov-2023 (Syllabus Year - 2016)****ELEMENTS OF BUSINESS MATHEMATICS(ELECTIVE/ALLIED)****Time: 2:30 Hours****Marks: 70****Instructions:**

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

Que.1(A) Define: Permutation and prove that $n P_n = r P_r$. ($n P_{(n-r)}$) (07)

Que.1(B) Find the value of n if 4 times the number of permutation of n things taken 3 together is equal to 5 times the number of permutations of (n-1) things taken 3 together (07)

OR

Que.1(A) Define: combination Find n if $2n C_3 : 2n C_8 = 8 : 3$ (07)

Que.1(B) Find the number of words that can be formed by taking 4 letters at a time out of word "PROPORTION" (07)

Que.2(A) Define: Arithmetic progression and prove that $S_n = n/2(a+1)$ (07)

Que.2(B) Which term of the series $12+9+6+\dots$ is equal to -51? (07)

OR

Que.2(A) Define Arithmetic Mean and Geometric mean and prove that $A > G$. (07)

Que.2(B) Find the G.P. whose 4th term is $1/18$ and 7th term is $-1/486$? (07)

Que.3(A) Find the middle term in the Expansion of $(\frac{x^2}{3} - \frac{3x}{4})^7$ (07)

Que.3(B) Find the value of $(1+\sqrt{3})^6 + (\sqrt{3} - 1)^6$ (07)

OR

Que.3(A) If in the binomial Expansion of $(a+b)^n$ the coefficient of the 6th and 16th term are equal find 'n' (07)

Que.3(B) Find middle term in the expansion $(1 + 3X + 3X^2 + X^3)^4$ (07)

Que.4(A) What is interpolation and extrapolation explain. (07)

Que.4(B) Estimate the production of 1983 from the following data. (07)

Year	1981	1982	1984	1985	1986	1987
Production	160	172	179	182	195	210

OR

Que.4(A) Applying Newton's method determine the form of the function (07)

X	0	2	4
F(X)	9	7	5

Que.4(B) Estimate no of deaths for 1984 (07)

Year	1980	1983	1985
No. Of Death	125	145	188

Que.5(A) In usual notation prove $\sum n = \frac{n(n+1)}{2}$ (07)

Que.5(B) $1.2.3 + 2.3.4 + 3.4.5 + \dots + n(n+1)(n+2) = \frac{n(n+1)(n+2)(n+3)}{4}$ (07)

OR

Que.5(A) In usual notation prove $\sum n^2 = \frac{n(n+1)(2n+1)}{6}$ (07)

Que.5(B) Prove that $2^{4n} - 1$ is divisible by 15 (07)
