

B.B.A. Semester - 1 (CBCS) Examination**Nov/Dec - 2022 (NEW COURSE)****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.

Q-1(A) Prove that ${}^nP_r = n(n-1)(n-2)\dots(n-r+1)$. (07)

Q-1(B) How many different words can be formed with the letters of HARYANA? In how many of these (07)

(i) H and N are together. (ii) Begin with H and end With N?

OR**Q-1(A)** (i) If ${}^{20}C_{3r} = {}^{20}C_{2r+5}$, find r. (07)(ii) If ${}^{2n}C_3 : {}^nC_2 = 44 : 3$ find n.**Q-1(B)** Prove that in usual notations ${}^nC_r = \frac{n!}{(n-r)!r!}$ $1 \leq r \leq n$. (07)**Q-2(A)** If $\frac{1}{b+c}, \frac{1}{c+a}, \frac{1}{a+b}$, are in A. P., prove that a^2, b^2, c^2 are also in A.P. (07)**Q-2(B)** Find five numbers in an A.P. whose sum is 15 and product of first two Terms is -1. (07)**OR****Q-2(A)** Find the sum of $72+70+68+\dots+40$. (07)**Q-2(B)** Prove that $\frac{1}{H-a} + \frac{1}{H-b} = \frac{2}{H}$. (07)**Q-3(A)** Prove that of $(\sqrt{3} + \sqrt{2})^4 + (\sqrt{3} - \sqrt{2})^4 = 98$. (07)**Q-3(B)** Find middle terms of $(x^2 + \frac{1}{x})^6$. (07)**OR****Q-3(A)** If T_{21} and T_{22} in the expansion of $(1+x)^{44}$ are equal, find x. (07)**Q-3(B)** Obtain the coefficient of x^{12} in the expansion of $(1+x^3)^{12}$. (07)**Q-4(A)** Find the cubic polynomial which takes the following values and then obtain (1.5) (07)

x	1	2	3	4
Y=f(x)	8	27	64	125

Q-4(B) Give the assumptions of interpolation and extrapolation. (07)**OR****Q-4(A)** Interpolate the missing values in the following table: (07)

Year	2008	2009	2010	2011	2012	2013
Index Numbers	150	170	180	?	200	220

Q-4(B) Estimate the profit for the year 1975 by lagrange's method. (07)

Year	1971	1972	1974	1979
Profit (in '000 Rs.)	21	35	56	84

Q-5(A) $1 + 5 + 9 + \dots + (4n - 3) = n(2n - 1)$. (07)**Q-5(B)** Prove that $2^{4n} - 1$ is divisible by 15. (07)**OR****Q-5(A)** Find the sum of n terms of $1.4+3.7+5.10+\dots$ (07)**Q-5(B)** Find T_n if $S_n = 2n^2 + 3n$ also find T_{20} . (07)
