

B.B.A. Semester – 1 (NEP-2020) Examination**January-2024****Basic Mathematics (MDC)****Time: 2:00 Hours****Marks: 50****Instructions:**

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

Que-1(A) Prove that $\frac{1}{(n-1)!} + \frac{1}{(n-2)!} = \frac{n^2}{n!}$. (05)

Que-1(B) How many number of (i) four digits (ii) three digits (iii) two digits can be formed with the digits 2, 3, 4, 5 written in all possible ways? (05)

OR

Que-1(A) Find n if. (i) $(n+1)! = 6(n-1)!$ (ii) $16 \cdot {}_nP_3 = 13 \cdot {}_{(n+1)}P_3$ (05)

Que-1(B) How many words of 4 letters can be formed by taking 4 letters from the word GUJARAT in which G must come. (05)

Que-2(A) Find the value of $(2 + \sqrt{5})^5 + (2 - \sqrt{5})^5$. (05)

Que-2(B) Find the seventh term in the expansion of $\left(\frac{4x}{5} + \frac{5}{2x}\right)^9$. (05)

OR

Que-2(A) Obtain the middle terms of $\left(\frac{x}{3} - \frac{3}{x}\right)^5$. (05)

Que-2(B) State binomial theorem and give its characteristics. (05)

Que-3 Explain the principle of Mathematical Induction. (10)

OR

Que-3 By the method of induction prove that: $1^3 + 2^3 + 3^3 + \dots + n^3 = \frac{n^2(n+1)^2}{4}$.

Que-4(A) The 4th term of an A.P. is 19 and its 12th term is 51, find its 21st term. (05)

Que-4(B) If the mth term of an A.P. is n and its nth term is m, prove that $(m+n)^{\text{th}}$ terms is 0. (05)

OR

Que-4(A) The 2nd term of a G.P. is 6 and its 5th term is $\frac{81}{4}$, find its first term. (05)

Que-4(B) The 3rd term of a G.P. is 3 and its 7th term is 243 find its first term and the common ratio. (05)

Que-5 Estimate the missing values : (10)

Year	2012	2014	2016	2018	2020	2022
Production	20	?	38	?	62	70

OR

Que-5 Estimate the percentage of criminals of age less than 35, using the following date:

Age (less than)	25	30	40	50
Percentage of criminals	52.0	67.3	84.1	94.4
