

B.Sc. Semester - 5 (Remedial) (NEP-2020) Examination**March/April-2026****MATH: Essential Mathematics for Competitive Examinations (Minor-4)****Time: 2:00 Hours****Marks:50****Instructions:**

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

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- Que.1 ATTEMPT ANY TWO: (10)
- (1) If $x = 3.232323\dots$ and $y = 0.232323\dots$, express $x + y$ as a rational number in lowest terms.
 - (2) The sum of three consecutive odd integers is 57. Find the integers and prove their product is also odd.
 - (3) If the HCF of two positive integers is 13 and their sum is 117, how many pairs of such integers exist? Find all such pairs.
- Que.2 ATTEMPT ANY TWO: (10)
- (1) A sum doubles itself in 7 years at CI compounded annually. In how many years will it become eight times?
 - (2) In what ratio must two qualities of rice having price of ₹72/kg and ₹54/kg be mixed so that selling their mixture at ₹72/kg yields 20% profit?
 - (3) A trader marks his goods 60% above cost price and allows a two-stage discount of 20% and 25%. What is the actual profit or loss percent?
- Que.3 ATTEMPT ANY TWO: (10)
- (1) Two trains 240 m and 360 m long in opposite directions, cross in 24 sec. Faster train's speed is twice than slower. Find approximate speed of both trains in km/hour.
 - (2) A sphere and cylinder is having equal volume. The height of the cylinder is equal to the diameter of the sphere. If the radius of the Cylinder is 3 cm, then find sphere's radius (correct upto 2 decimal places).
 - (3) Boat goes 36 km downstream in 3 h and upstream in 6 h. If it goes downstream 1 h, then returns, how long for return?
- Que.4 ATTEMPT ANY TWO: (10)
- (1) Find the real solution of the equation $\frac{1}{(x-2)} + \frac{1}{(x+2)} = \frac{2}{x}$ if exists.
 - (2) The sum and the sum of squares of three integers which are in AP are 15 and 83 respectively. Find these integers.
 - (3) A bag with 5 red and 3 blue balls. Two balls are drawn without replacement. Find the probability of the event in which both the drawn balls are red?
- Que.5 ATTEMPT ANY TWO: (10)
- (1) A two-digit number becomes 9 times the sum of its digits when multiplied by 3. Find the number.
 - (2) Metal cube edge 20 cm melted into cubes of edge 5 cm. How many small cubes, and total surface area?
 - (3) A chemist prepares a two-chemical blend worth ₹540/kg by mixing chemicals valued at ₹400/kg and ₹700/kg. If the cheaper is twice the costlier in weight and the total weight is 60 kg, form equations and find quantities.
