

Sub.Code : 0081 (New course) Set 'B'
NEB-GRADE XII
2083 (2026)
Mathematics

(For the students whose first two digits of registration number starts from 80, 81 and 82)

Attempt **all** the questions.

Group 'A' [11×1=11]

Rewrite the correct option of each question in your same answer sheet.

1. Which one of the following represents $\sum n^3$?

- A) $\frac{n(n+1)}{2}$ B) $\frac{n^2(n+1)}{4}$
 C) $\frac{n^2(n+1)(n+2)}{4}$ D) $\frac{n^2(n+1)^2}{4}$

2. Which one is the highest Common Factor (HCF) of $n!$, $(n+1)!$, and $(n+2)!$?

- A) $(n+2)!$ B) $(n+1)!$ C) $n!$ D) n

3. Which one of the following is equation of circle which touches x -axis and whose centre is at $(3,4)$?

- A) $x^2 + y^2 + 6x + 8y + 9 = 0$ B) $x^2 + y^2 - 6x - 8y + 9 = 0$
 C) $x^2 + y^2 + 6x + 8y + 16 = 0$ D) $x^2 + y^2 - 6x - 8y + 16 = 0$

4. In any triangle ABC, $a=3$, $b=4$ and $c=5$, then which is equal to $\sin \frac{A}{2}$?

- A) $\frac{3}{\sqrt{10}}$ B) $\frac{1}{\sqrt{10}}$ C) $\frac{1}{10}$ D) $\frac{3}{10}$

5. If $\vec{a}$ and $\vec{b}$ be two vectors then the projection of the vector $\vec{a}$ on $\vec{b}$ is :

- A) $\frac{\vec{a} \cdot \vec{b}}{|\vec{b}|}$ B) $\frac{\vec{a} \cdot \vec{b}}{|\vec{a}|}$ C) $\vec{a} \cdot \vec{b}$ D) $\frac{\vec{a} \cdot \vec{b}}{|\vec{a}| |\vec{b}|}$

6. A and B are dependent events. $P(A)=\frac{1}{2}$, $P(B)=\frac{1}{3}$ and $P(A \cap B)=\frac{1}{5}$, which one of the following is $P(A/B)$?

- A) $\frac{1}{6}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{19}{30}$

7. Which one is the derivative of $\log \left(\cosh \frac{x}{a} \right)$?

- A) $\frac{1}{a} \tanh \frac{x}{a}$ B) $\tanh \frac{x}{a}$ C) $\frac{1}{a} \operatorname{sech} \frac{x}{a}$ D) $\frac{1}{a} \coth \frac{x}{a}$

Contd...

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8. What is the value of $\lim_{x \rightarrow 1} \left(\frac{x^3 - 1}{x^2 - 1} \right)$?

- A) $\frac{1}{2}$ B) $\frac{3}{2}$ C) 2 D) 3

9. Which one is the solution of $ydx - \frac{x}{2} dy = 0$?

- A) $y = c\sqrt{x}$ B) $x = c\sqrt{y}$
 C) $y = cx$ D) $x = cy$

10. The integrating factor for the differential equation $\frac{dy}{dx} - \frac{y}{x} = x^2$ is

- A) $\log \frac{1}{x}$ B) $e^{-\frac{1}{x}}$ C) $\frac{1}{x}$ D) $-\frac{1}{x}$

11. After forward row reduction in Gauss elimination method, if the augmented matrix of given system of three linear equations reduces to following form, then the system of equations has

$$\left[\begin{array}{ccc|c} a_1 & b_1 & c_1 & d_1 \\ 0 & b_2 & c_2 & d_2 \\ 0 & 0 & 0 & 0 \end{array} \right]$$

- A) Unique solutions B) Infinitely many solutions
 C) No solutions D) Only one solution
 OR

In a projectile, initial velocity is 40ms^{-1} and angle of projection is 30° , what is its time of flight ?

- A) $\frac{10}{g}$ B) $\frac{20}{g}$ C) $\frac{40}{g}$ D) $\frac{80}{g}$

Note : In question No. 17 e) write $\frac{d^2y}{dx^2}$ in place of $\frac{d^2y}{2x^2}$.