

## NEB-GRADE XII

2081 (2024)

## Mathematics

(For Regular Students only)

(For the students whose first two digits of registration number starts from 80)

Attempt all the questions.

Group 'A'

[11×1=11]

Rewrite the correct options of each questions in your same answer sheet.

1. The permutation of 'n' things taken 'r' at a time when each things may occur any numbers of times is...

A) n ways    B)  $r^n$  ways    C)  $n^r$  ways    D)  $(n \times r)$  ways.     $p(n, r)$

2. Which one of the following is Euler's form of complex number  $-i$ ?

A)  $e^{\frac{\pi i}{4}}$

B)  $e^{\frac{3\pi i}{2}}$

C)  $e^{\frac{3\pi i}{4}}$

D)  $e^{\frac{\pi i}{2}}$

3. in  $\triangle ABC$ ,  $\angle A = 30^\circ$ ,  $\angle B = 45^\circ$ , which one of the following is a:c?

A)  $\frac{\sqrt{2}}{\sqrt{3}+1}$

B)  $\frac{3+1}{\sqrt{2}}$

C)  $\frac{\sqrt{3}+1}{2\sqrt{2}}$

D)  $\frac{2\sqrt{2}}{\sqrt{3}+1}$

4. Which one of the following has transverse axis and conjugate axis?

A)  $y^2 - 4y - 4x + 4 = 0$

B)  $2y^2 - 3x^2 - 6 = 0$

C)  $2y^2 + 3x^2 - 6 = 0$

D)  $2x^2 + 2y^2 = 72$

5. It is given that  $\vec{a}$  and  $\vec{b}$  are two vectors such that  $|\vec{a} \times \vec{b}| = |\vec{a} \cdot \vec{b}|$ .

What is the angle between  $\vec{a}$  and  $\vec{b}$ ?

A)  $\pi$

B)  $\frac{\pi}{2}$

C)  $\frac{\pi}{4}$

D)  $\frac{\pi}{6}$

6. In a school there were 100 students, 35% students failed in mathematics, 20% students failed in science and 15% failed in both of the subjects. A student selected at random, the probability of the student fail in mathematics given that failed in science already is

A)  $\frac{3}{7}$

B)  $\frac{4}{7}$

C)  $\frac{3}{4}$

D)  $\frac{1}{4}$

Contd...



7. Which one of the following is the derivative of  $\operatorname{cosec} h^{-1}(x)$  ?

~~A)  $\frac{1}{x\sqrt{x^2+1}}$~~

B)  $\frac{-1}{x\sqrt{x^2+1}}$

C)  $\frac{1}{x\sqrt{1-x^2}} \quad (|x| < 1)$

D)  $\frac{-1}{x\sqrt{1-x^2}} \quad (|x| < 1)$

8. Which one of the following is equal to  $\lim_{x \rightarrow 0} \frac{e^{3x} - 1}{2x}$  ?

A) 0

B)  $\frac{1}{2}$

~~C)  $\frac{3}{2}$~~

D) 3

9. Which one of the following represents the equation of normal to the curve  $x^2 = 2y$  at the point  $(-2, 2)$  ?

~~A)  $2x + y + 6 = 0$~~

B)  $2x - 2y + 6 = 0$

C)  $2x - y + 6 = 0$

D)  $x - 2y + 6 = 0$

10. Which one of the following is the solution of differential equation  $x dy - y dx = 0$  ?

A)  $x = cy$

~~B)  $y = cx$~~

C)  $xy = c$

D)  $x - y = c$

11. In Gauss elimination method, the coefficient of the variables of the element  $a_{ij}$  where  $i = j$  are known as...

~~A) pivot element~~

B) common element

C) non basic element

D) basic element

Or

A shot 40 kg projected from a 400 kg gun with a velocity of 60 m/sec, then the velocity with which the gun would commence to recoil, if free to move in the line of projection is

A) 6 m/sec

B) 60 m/sec

C) 6 km/min

D) 600 m/sec