झारखण्ड शैक्षिक अनुसंधान एवं प्रशिक्षण परिषद्, राँची

PROJECT RAIL
(REGULAR ASSESSMENT FOR IMPROVED LEARNING)
General School

विषय- गणित | कक्षा- **12**

समय - 1 घण्टा | पूर्णांक- **20**

General Instructions:

1. *There are total **12** questions in this question paper. It is compulsory to answer all the questions.*

2. *Type of questions and marks:*

*Questions **1** to **6** - Objective questions (6x1=**6**)*
*Questions 7 to **10** - Short answer questions (**4**x2=**8**)*
*Questions **11** and **12** - Long answer questions (**2**x3=**6**)*

3. *Questions **1** to **6** are multiple choice type. Out of **6** multiple choice questions, **2** questions are competency based questions. Each question carries **1** mark. Four options are given for multiple choice type questions **1** to **6.** Select the correct option (a, b, c, d) and write it in the answer sheet.*

4. *No candidate will be allowed to leave the examination hall before the end of the examination.*

SECTION- A (6x1=6) (वस्तुनिष्ठ प्रश्न)

1. $\int_0^1 1/\sqrt{(1-x^2)}\,dx =$

(a) π/2 (b) π/4 (c) 2π/3 (d) 3π/2

2. $\int_0^{2a} f(x)dx = 0$ if

(a) f(x) is an even function (b) f(2a-x) = f(x)

(c) f(2a-x) = -f(x) (d) f(x) is an odd function.

3. If $\vec{a} \cdot \vec{b} = 1$, $|\vec{a}| = 1$ and $|\vec{b}| = 2$ then cosθ =

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(a) 1 (b) 0 (c) 1/2 (d) $1/\sqrt{2}$

4. The direction cosines of z-axis are

(a) (0,0,0) (b) (1,0,0) (c) (0,1,0) (d) (0,0,1)

5. $(\vec{a} - \vec{b}) \times (\vec{a} + \vec{b}) =$

(a) $2(\vec{a} \times \vec{b})$ (b) $\vec{a} \times \vec{b}$ (c) $|\vec{a}|^2 - |\vec{b}|^2$ (d) None of these.

6. $\int_{\pi/2}^{-\pi/2} sin^9 x \ dx$

(a) -1 (b) 1 (c) 0 (d) None of these.

SECTION- B (4x2=8) (लघु उत्तरीय प्रश्न)

7. Find the value of λ for which the $\lambda(\hat{i} + \hat{j} + \hat{k})$ is a unit vector.

8. Find the angle between two vectors $\vec{a}$ and $\vec{b}$ with magnitude $\sqrt{3}$ and 2 respectively having $\vec{a} \cdot \vec{b} = \sqrt{6}$.

9. Evaluate $\int_0^4 \sqrt{x} / (\sqrt{(4-x)} + \sqrt{x}) \ dx$

10. Evaluate $\int_{-1}^{2} |x^3 - x| dx$

SECTION- C (2x3=6) (दीर्घ उत्तरीय प्रश्न)

11. Find the area of region bounded by the line y=3x+2 ,the x-axis and the ordinate x = -1 and x = 1.

12. Evaluate $\int_0^{\pi/4} \log(1 + \tan x) \ dx$

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