

**RPET 2008**

**SAMPLE PAPER**

**MATHEMATICS**

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1. If  $f: \mathbb{R} \rightarrow \mathbb{R}$  be defined by  $f(x) = 3x - 4$ ,

$f^{-1}(x)$  is

(1)  $1/(3x-4)$

(2)  $4/3 - x$

(3)  $3x + 4$

(4)  $4/3 - x$

2. The derivative of  $\sec x$  is

(1)  $\log(\sec x + \tan x)$

(2)  $\sec x + \tan x$

(3)  $\sec x \tan x$

(4)  $\log \sec x \tan x$

3. The primitive of  $\tan x$  is

(1)  $\log \sec x$

(2)  $\log \cos x$

(3)  $\sec^2 x$

(4)  $\cot x$

4. For what value of  $m$  the roots of  $12x^2 + mx + 5 = 0$  are in the ratio  $3 : 2$ ?

(1)  $12/5$

(2)  $5/12$

(3)  $5/12 \cdot 10$

(4)  $5 \cdot 10$

5. Which one of the following is the value of the determinant

$$\begin{vmatrix} z & x & y \\ y & z & x \\ x & y & z \end{vmatrix}$$

+

+

+

1

1

1

?

(1)  $x + y + z$

(2) Zero

(3)  $(1 + x + y + z)$

(4)  $(1 - x)(1 - y)(1 - z)$

7. If  $\cos \alpha + \cos \beta + \cos \gamma = 0$  and  $\sin \alpha + \sin \beta + \sin \gamma = 0$ , then  $\cos 3\alpha + \cos 3\beta + \cos 3\gamma$  is equal to:

(1)  $\cos 3(\alpha + \beta + \gamma)$

(2)  $3\cos(\alpha + \beta + \gamma)$

(3)  $\cos(\alpha + \beta + \gamma)$

(4)  $\cos(3\alpha + 3\beta + 3\gamma)$

8. A bag contains 3 red, 6 white and 7 blue balls. The probability that two balls drawn from the bag are white and blue is :

(1)  $7/120$

(2)  $7/20$

(3)  $13/120$

(4)  $1/120$

9. If

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$A = 2i + 2j - k$  and

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$B = 6i - 3j + 2k$

then

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A .

→

B will be :

(1) 2

(2) 5

(3) 4

(4) 6

10 If the straight line  $y = mx + c$  is a tangent to the circle  $x^2 + y^2 = a^2$ , then  $c$  is equal to :

(1)  $a/m$

(2)  $a\sqrt{1 - m^2}$

(3)  $a\sqrt{1 + m^2}$

(4)  $am$