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OB-1103-175

Roll No.

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**Second Unit Test, 2014-2015**

**Maths**

**Time : 1½ hrs. ]**

**Class-XI**

**[M. M. : 40**

**Note:-All questions are compulsory.**

**Section (A)**

**(1 marks each)**

1 ✓ Prove for  $n=1$

$$\left(1 + \frac{3}{1}\right)\left(1 + \frac{5}{4}\right)\left(1 + \frac{7}{9}\right)\dots\dots$$

$$\left(1 + \frac{(2n+1)}{n^2}\right) = (n+1)^2$$

2 ✓ Express in  $a+ib$  form

$$i^{35} + \frac{1}{i^{35}}$$

3 ✓ Solve  $5x - 3 < 3x + 1$ , when  $x$  is an integer. *Chap 6, Ex. 2*

4 ✓ Find total no. of ways of answering 6 multiple choices questions having 4 choices.

**(P.T.O.)**

## Section (B)

(4 marks each)

5 Prove that  $5^n - 5$  is divisible by 4 for all  $n \in \mathbb{N}$ . Hence prove that  $2 \cdot 7^n + 3 \cdot 5^n - 5$  is divisible by 24 for all  $n \in \mathbb{N}$ . *Chap. 4, Ex. 6*

6 ✓ Prove by mathematical Induction : ( $n \in \mathbb{N}$ )

$$\frac{1}{1.2.3} + \frac{1}{2.3.4} + \frac{1}{3.4.5} + \dots + \frac{1}{n(n+1)(n+2)}$$

$$= \frac{n(n+3)}{4(n+1)(n+2)}$$

*Ex. 4.11*

7 ✓ Solve the following system of inequalities graphically :

$$3y - 2x \leq 4, \quad x + 3y > 3, \quad x + y \geq 5, \quad y < 4$$

8

Find real values of  $\theta$  such that

$$\frac{3 + 2i \sin \theta}{1 - 2i \sin \theta}$$

is a real number.

*Example-15*  
*Page-111*

9 ✓

A solution of 8% boric acid is to be diluted by adding a 2% boric acid solution to it. The resulting mixture is to be more than 4% but less than 6% boric acid. If we have 640 litres of 8% solution, how many litres of 2% solution will have to be added ?

*Chap. 6*

10 ✓

Find n if

$${}^{2n+1}P_{n-1} : {}^{2n-1}P_n = 3 : 5$$

## Section (C)

(6 marks each)

- 11 Out of 6 boys & 4 girls, a committee of 5 is to be formed. In how many ways can this be done if :
- (i) atleast 2 girls are included ?
  - (ii) atmost 2 girls are included ?
- 12 (i) Find the number of words which can be mode using all letters of the word AGAIN. If these words are written as in a dictionary. What will be the fiftieth word ?
- (ii) How many 4-digit numbers can be formed from digits 1, 1, 2, 2, 3, 3, 4, 4, 5, 5 ?

सं. Chap 6 Ex. 2

6 multiple choices questions

(P.T.O.)

