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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

$$\left(1 + \frac{3}{1}\right)\left(1 + \frac{5}{4}\right)\left(1 + \frac{7}{9}\right) \dots \left(1 + \frac{(2n+1)}{n^2}\right) = (n+1)^2$$

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.)

(2)

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Section (B)

(4 marks each)

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

6 Prove by mathematical Induction : ($n \in N$)

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

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

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 θ such that

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

is a real number.

9

A solution of 8% boric acid is to be deluted 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

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

(3)

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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.)



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