No. of printed pages: 2

INDIAN SCHOOL SOHAR

UNIT TEST

SUB: MATHEMATICS

STD: XI **MARKS: 50**

DATE: 25.05.14 **TIME: 2hrs**

General Instructions:

1. *All questions are compulsory.*
2. *The question paper consists of 15 questions divided into three sections A, B and C. Section A comprises of 6 questions of one mark each, section B comprises of 5 questions of four marks each and section C comprises of 4 questions of six marks each.*
3. *All questions in Section A are to be answered in one word, one sentence or as per the exact requirement of the question.*
4. *There is no overall choice. However, an internal choice has been provided in 2 questions of four marks each and 1 question of six marks .You have to attempt only one of the alternatives in all such questions.*
5. *Use of calculators is not permitted.*

SECTION – A

1. Large hand of a clock is 42 cm long. How much distance does its extremity move in 20 minutes?
2. Evaluate: cosec($\frac{7\pi}{6}$) – sin ($\frac{2\pi}{3}$)
3. If A = { 3, 4}, B = { 1, 5, 6} and C = {3, 6, 9, 10} D= { 4, 6 }; find

   i) B × (A ∩ D) ii) B – C
4. Write the following set in roster form: B = { b_n : nϵ N, $b_{n+1} = 5\, b_n$ and $b_1 = 1$}
5. Write the domain and range of f(x) = $[x]$.
6. If the ordered pairs (x , -1) and (3, y) belong to the set { (a,b) : b = 2a – 3}, find the values of x and y.

SECTION- B

7. Find the domain and range of the real valued function f (x) given by; f(x) = $\frac{1}{1-x^2}$
8. a)Let R be the subset of Z x Z defined by R = { ($x + y , xy$): $x, y \in Z$ }. Is R a function from Z to Z? Justify your answer.

   b) If A= {2, {1,3}} B={ 4,5} then find P(A) and B × B × B.

9. Let A,B and C be the sets such that A ∪ $B = A \cup C$ and $A \cap B = A \cap C$. Show that B = C

10. Solve the equation ; $\sqrt{2}\sec\theta + tan\theta = 1$

OR

In any triangle ABC, prove that: $\sin\frac{B-C}{2} = \frac{b-c}{a}\cos\frac{A}{2}$

11. Using principle of mathematical induction prove that :

4^n + 15n - 1 is divisible by 9 for all n∈ N.

OR

$\left(1+\frac{1}{1}\right)\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right)\ldots\left(1+\frac{1}{n}\right)$= (n+1) for all n∈ N.

SECTION- C

12. Prove by the principle of mathematical induction that for all nϵ N :

$$\frac{1}{3.5}+\frac{1}{5.7}+\frac{1}{7.9}+\ \ldots+\frac{1}{(2n+1)(\,2n+3)}=\ \frac{n}{3(2n+3)}$$

13. In a town of 10,000 families it was found that 40% families buy newspaper A, 20% families buy newspaper B and 10% families buy newspaper C. 5% families buy A and B, 3% families buy B and C and 4% families buy A and C. If 2% families buy all the three newspapers, find the number of families which buy i) A only ii) B only iii) none of A, B and C. *Mention any 2 importance of reading newspaper every day.*

14. Prove that:$cos^2A+\ cos^2(A+\frac{2\pi}{3})+cos^2(A-\frac{2\pi}{3})=\frac{3}{2}$

OR

$\cos20^0\cos40^0\cos60^0\cos80^0=\frac{1}{16}$

15. Find $cos\frac{x}{2}\ and\ tan\frac{x}{2}, if\ tanx=\frac{-4}{3}$, x lies in the second quadrant.

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