Summer Fields School

KAILASH COLONY, NEW DELHI-110048

PERIODIC TEST I (2017-2018)
SET-1 MATHEMATICS
Class – X

Maximum Marks: 50

Time allowed: 1½ hours

General Instructions:

(i) All questions are **compulsory**.

(ii) The question paper consists of **19** questions divided into four **sections A, B, C and D. Section-A** comprises of **4** questions of **1 mark** each, **Section-B** comprises of **4** questions of **2 marks** each, **Section-C** comprises of **6** questions of **3 marks** each and **Section-D** comprises of **5** questions of **4 marks** each.

(iii) There is no overall choice.

(iv) Use of calculator is not permitted.

SECTION-A

1. Without drawing the graph of $y = x^3 - 4x^2$, find the number of points where it meets x-axis.
2. Find the HCF of the smallest composite number and the smallest prime number.
3. Find the probability of getting 53 Sundays in a leap year
4. A man standing in the sun finds that his shadow is equal to his height. Find the angle of elevation of the sun at that time.

SECTION-B

5. Prove that $5 - 2\sqrt{3}$ is an irrational number.
6. Find the value of k if the quadratic polynomial $2x^2 - 3kx + 5$ has 9 as the sum of its zeroes.
7. If there are three children in a family, find the probability that there are at most two girl children in the family.
8. If $\sec 3A = \operatorname{cosec}(30° - A)$ where 3A and $(30° - A)$ are acute angles then find the value of A.

SECTION-C

9. There are 24 nuts of same size and 32 bolts of same size. It is required to pack all of them separately such that each packet contains equal number of nuts or bolts. What is the maximum number of nuts or bolts that should be kept in each packet? Also find the minimum number of packets that should be formed.
10. Let α and β be the zeroes of a polynomial $p(x) = x^2 - 2x + 7$. Find a quadratic polynomial whose zeroes are 2α and 2β.
11. Two men on either side of a 80 m high cliff observe the angles of elevation of the top of the cliff to be 30° and 60° respectively. Find the distance between the two men.

12 All cards of ace, jack and queen are removed from a deck of playing cards. One card is drawn at random from the remaining cards. Find the probability that the card drawn is:

i) A face card

ii) Not a face card

13 A bag contains cards which are numbered from 2 to 90. A card is drawn at random from the bag. Find the probability that it bears:

i) A two digit number

ii) A number which is a perfect square

14 An incomplete distribution is given as below:

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
frequency	10	20	x	40	y	25	15

If the median is 35 and the sum of all the frequencies is 170, find the missing frequency x and y.

SECTION-D

15 Obtain all other zeroes of $p(x) = 2x^4 - 2x^3 - 7x^2 + 3x + 6$ if two of its zeroes are $\sqrt{\frac{3}{2}}$ and $-\sqrt{\frac{3}{2}}$.

16 Prove that $\frac{\tan\theta+\sec\theta-1}{\tan\theta-\sec\theta+1} = \frac{1+\sin\theta}{\cos\theta}$.

17 If $3\cot\theta = 4$, find the value of $\frac{5\sin\theta-3\cos\theta}{5\sin\theta+3\cos\theta}$.

18 The angle of elevation of the top of a tower from a point A on the ground is 30°. On moving a distance of 20 m towards the foot of the tower to a point B, the angle of elevation increases to 60°. Find the height of the tower and the distance of the tower from point A.

19 Draw less than and more than ogive on the same graph paper for the following data and hence determine median for it.

Marks	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
No. of students	7	10	20	13	17	10	14	9