



**SEVEN SQUARE ACADEMY**  
**Academic Year – 2018-2019**  
**Secondary Section (Pre-Board II)**

Name: \_\_\_\_\_

Subject: Mathematics

Date: 28/01/2019

Class: X

Time: 3:00 Hours

Marks: 80 Marks SET- B

**General Instructions:**

1. All questions are compulsory.
2. The question paper consists of 30 questions divided into 4 sections A, B, C, D.
3. Section A contains 6 questions of 1 mark each.
4. Section B consists of 6 questions of 2 marks each.
5. Section C consists of 10 questions of 3 marks each.
6. Section D consists of 8 questions of 4 marks each.
7. Use of calculator is not permitted.

$N_1 + N_2 = LCM \times HCF$   
 $\frac{N_1 \times N_2}{HCF} = \dots$

**Section – A**

(6 x 1 = 6 Marks)

Q.1. If the product of two numbers is 2500 and their HCF is 50, find their LCM. 50

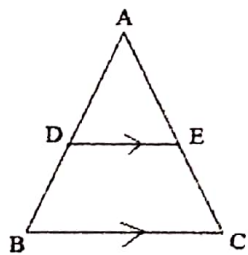
Q.2. Find the roots of quadratic equation by factorization method.  $9x^2 - 17x + 8 = 0$ .

OR

Find the discriminant of the quadratic equation  $2x^2 - 2\sqrt{2}x + 1 = 0$ .  $\sqrt{2}/2$

Q.3. In an AP, if  $a = 3$ ,  $n = 8$ ,  $S_n = 192$ . Find  $d$  (common difference). 6

Q.4. In fig.  $DE \parallel BC$  and  $AD : DB = 1 : 2$ . Find  $\frac{Ar(\triangle ADE)}{Ar(\triangle ABC)}$ .



2	7, 2
2	36
2	18
3	9
3	3
3	1

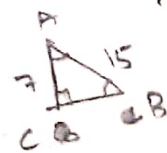
$\frac{13}{16} = \frac{13}{4} \times \frac{1}{4}$   
 $\frac{13}{52}$

Q.5. If A and B are the points  $(-6, 7)$  and  $(-1, -5)$  respectively then find the distance 5AB. 65

Q.6. If  $\sin 3\theta = \cos(\theta - 6^\circ)$  then find value of  $\theta$ . 24

OR

If  $\sec A = \frac{15}{7}$  and  $A + B = 90^\circ$ , find the value of  $\operatorname{cosec} B$ . 15/7



$A + B = 90^\circ$   
 S C  
 T C  
 C P

$\sin 3\theta = \cos(\theta - 6)$

$\sin(90 - 3\theta) = \cos(\theta - 6)$

$\cos(90 - 3\theta) = \cos(\theta - 6)$

$\frac{15}{7} = \frac{15}{7} \times \frac{1}{1}$

**Section - B**

(6 x 2 = 12 Marks)

Q.7. Using Euclid's division lemma find HCF of 714 and 315.

OR

Prove that  $\frac{2\sqrt{5}}{7}$  is an irrational number.

Q.8. Determine k for which the system of equation has infinite solutions:

$4x + y = 3; 8x + 2y = 5k$

Q.9. Find the sum:  $-5 + (-8) + (-11) + \dots + \dots + (-230)$ .

OR

Find the sum of all natural numbers less than 100 which are divisible by 6.

Q.10. Find the coordinates of the points of trisection of the line segment joining (4, -1) and (-2, -3).

Q.11. A box contains cards bearing numbers from 6 to 50. If one card is drawn at random from the box, find the probability that it bears -

- a. A one digit number  $\frac{4}{50}$
- b. An odd numbers greater than 26  $\frac{12}{50}$

Q.12. Three unbiased coins are tossed. What is the probability of getting

- i) two heads  $\frac{3}{8}$
- ii) atleast 2 heads  $\frac{1}{6}$

**Section - C**

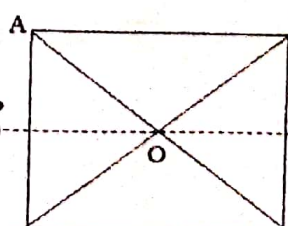
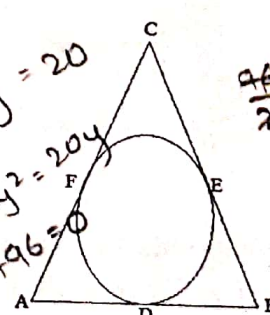
(10 x 3 = 30 Marks)

Q.13. Using fundamental theorem of Arithmetic, find HCF and LCM of 426 and 576.

Q.14. If the polynomial  $6x^4 + 8x^3 - 5x^2 + ax + b$ , is exactly divisible by the polynomial  $2x^2 + 5$ , then find the value of a and b.

Q.15. The sum of two numbers is 20 and the sum of their reciprocals is  $\frac{5}{24}$ , find the numbers.

Q.16. A circle is inscribed in a  $\Delta ABC$  having sides 8cm, 10cm and 12cm as shown in figure. Find AD, BE and CF, where  $AB = 12\text{cm}$ ,  $AC = 10\text{cm}$  and  $BC = 8\text{cm}$ .



HHH  
HTT  
HTH  
TTH  
THT  
THH  
O is any point inside a rectangle ABCD. Prove that  $OB^2 + OD^2 = OA^2 + OC^2$

Handwritten calculations for Q.16:  
 $96 + y = 20$   
 $96 + y^2 = 20y$   
 $20y + 96 = 0$   
 $AD = 6, BE = 4, CF = 5$

Handwritten calculations for Q.15:  
 $\frac{1}{x} + \frac{1}{y} = \frac{5}{24}$   
 $x + y = 20$   
 $24(x + y) = 5xy$   
 $24x + 24y = 5xy$   
 $24x + 24(20 - x) = 5x(20 - x)$   
 $24x + 480 - 24x = 100x - 5x^2$   
 $480 = 100x - 5x^2$   
 $5x^2 - 100x + 480 = 0$   
 $x^2 - 20x + 96 = 0$   
 $(x - 12)(x - 8) = 0$   
 $x = 12, 8$   
 $y = 8, 12$

17. If the points (10, 5) (8, 4) and (6, 6) are the midpoint of the sides of triangle. Find its vertices.

OR

Prove that A = (2, 0), B = (9, 1) and C = (11, 6) are non-collinear point.

Q.18. Determine the value of x such that  $2\operatorname{cosec}^2 30^\circ + x\sin^2 60^\circ - \frac{3}{4}\tan^2 30^\circ = 10$ .

OR

If  $\sqrt{3}\sin\theta = \cos\theta$ , find value of  $\frac{3\cos^2\theta + 2\cos\theta}{3\cos\theta + 2}$ .

Q.19. Prove that the parallelogram circumscribing a circle is rhombus.

Q.20. A race track is in form of a ring whose inner circumference is 352m and outer circumference is 396m. Find the width of the track.

Q.21. A bucket is in form of frustum of a cone. Its depth is 15cm and diameter of the top and bottom are 56 cm and 42 cm respectively. Find how much of water can the bucket holds?

OR

Three cubes of each of sides 15cm are joined end to end. Find the total surface area of the resulting cuboid.

Q.22. Find 'p' if mean of given data is 15.45

Class	Frequency
0-6	6
6-12	8
12-18	p
18-24	9
24-30	7

**Section - D**

(8 x 4 = 32 Marks)

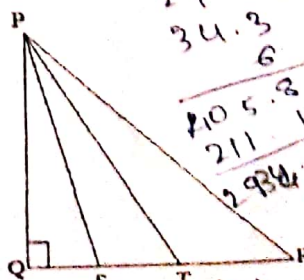
Q.23. A two digit number is such that their sum is 18 and their product is 56. Find the numbers.

OR

The numerator of a fraction is 3 less than its denominator. If 1 is added to the denominator the fraction is decreased by  $\frac{1}{15}$ . Find the fraction.

Q.24. The first term of an A.P is 5, the last term is 45 and the sum of all its term is 400. Find no. of terms and the common difference of the A.P.

Q.25. In figure, S and T trisect the side QR of a right triangle PQR. Prove that  $8PT^2 = 3PR^2 + 5PS^2$ .



Q.26. Prove that  $\frac{\operatorname{cosec} A}{\operatorname{cosec} A - 1} + \frac{\operatorname{cosec} A}{\operatorname{cosec} A + 1} = \frac{2}{\cos^2 A}$ .

Q.27. The angle of elevation of a cloud from a point 60m above the lake is  $30^\circ$  and angle of depression of reflection of the cloud in the lake is  $60^\circ$ . Find the height of the cloud.

OR

A girl 3m tall is 30m away from a building. The angle of elevation of the top of building from her eye is  $45^\circ$ . Find the height of the building.

Q.28. Construct an isosceles triangle whose base is 6cm and altitude 3.2cm. Then construct another triangle whose sides are  $3\frac{1}{2}$  times corresponding sides of the given isosceles triangle.

Q.29. A sphere of diameter 12cm is dropped in a right circular cylindrical vessel partly filled with water. If the sphere is completely submerged in water, the water level in the cylindrical vessel rises by  $3\frac{5}{9}$  cm. Find the diameter of the cylindrical vessel.

Q.30. Find the median of the following data:

C.I	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	3	6	12 $f_0$	13 $f_1$	6 $f_2$	3	2

OR

$$L + \frac{(F_1 - F_0)}{2(F_1 - F_0 - F_2)} \times h$$

Find the mode of the following data:

C.I	130-140	140-150	150-160	160-170	170-180	180-190	190-200
Frequency	6	10	18	29	25	11	8