



X-8

**HANSRAJ PUBLIC SCHOOL**  
**SECTOR-6, PANCHKULA**  
**CLASS-X, PAT (2025-26)**  
**SUBJECT- MATHEMATICS-I**

Date-01-12-2025  
Time: 2 hours

Roll No. 31  
Maximum Marks: 50

**General Instructions:**

1. This question paper consists of 22 questions in five sections.
2. Section A carries 10 questions of ONE mark each (8 M.C.Q's and 2 Assertion-Reason questions).
3. Section B carries 4 questions of TWO marks each.
4. Section C carries 3 questions of THREE marks each.
5. Section D carries 3 questions of 5 marks each.
6. Section E has 2 Case Study based questions carrying 4 marks each.
7. All questions are compulsory. However, an internal choice is provided in some questions.
8. Draw neat figures wherever required. Take  $\pi = 22/7$  wherever required if not stated.

**SECTION A**

Section A consists of 20 questions of 1 mark each.

Q.1. The HCF and LCM of 12, 21, and 15 respectively are:

- (A) 3, 140      (B) 12, 420      (C) 3, 420      (D) 420, 3

Q.2. If one zero of the polynomial  $f(x) = (k^2 + 4)x^2 + 13x + 4k$  is the reciprocal of the other, then  $k$  is:

- (A) 2      (B) -2      (C) 1      (D) -1

Q.3. The pair of equations  $x + 2y + 5 = 0$  and  $-3x - 6y + 1 = 0$  have:

- (A) a unique solution      (B) exactly two solutions  
(C) infinitely many solutions      (D) no solution

Q.4. The value(s) of  $k$  for which the quadratic equation  $2x^2 - kx + k = 0$  has equal roots is:

- (A) 0 only      (B) 4      (C) 8 only      (D) 0, 8

Q.5. The 10th term from the end of the A.P.: 5, 8, 11, ..., 47 is:

- (A) 20      (B) 18      (C) 23      (D) 19

Q.6. In  $\triangle ABC$ , D and E are points on sides AB and AC respectively such that  $DE \parallel BC$ . If  $AD = 2.5$  cm,  $DB = 3$  cm and  $AE = 3.75$  cm, then  $AC = ?$

- (A) 7.5 cm      (B) 8.25 cm      (C) 6.75 cm      (D) 7.25 cm

Q.7 The distance of the point  $P(-3, -4)$  from the x-axis (in units) is:

- (A) 3      (B) -3      (C) 4      (D) 7

- Q.8. If sum of zeroes of  $3x^2 - kx + 6$  is 3,  $k =$   
(A) 1 (B) -9 (C) 9 (D) -1

**DIRECTION:** In the question number 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option

**Q.9 Assertion (A):** The HCF of two numbers is 16 and their product is 3072. Then their LCM is 192.

**Reason (R):** For any two positive integers  $a$  and  $b$ ,  $HCF(a, b) \times LCM(a, b) = a \times b$ .

- (A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)  
(B) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)  
(C) Assertion (A) is true but reason (R) is false.  
(D) Assertion (A) is false but reason (R) is true.

**Q.10. Assertion (A):** The point  $(0, 4)$  lies on the  $y$ -axis.

**Reason (R):** The  $x$ -coordinate of any point on the  $y$ -axis is zero.

- (A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)  
(B) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)  
(C) Assertion (A) is true but reason (R) is false.  
(D) Assertion (A) is false but reason (R) is true.

### SECTION B

Section B consists of 4 questions of 2 marks each.

Q.11. Find the HCF of 612 and 1314 using the prime factorization method.

Q.12. Find the ratio in which the  $y$ -axis divides the line segment joining the points  $(5, -6)$  and  $(-1, -4)$ .

Q.13. For which value(s) of  $k$  will the pair of linear equations  $kx + 3y = k - 3$  and  $12x + ky = k$  has no solution?

Q.14. (A) Find the sum of all 3-digit numbers which are divisible by 7

OR

(B) If the 9th term of an A.P. is zero, prove that its 29th term is twice its 19th term.

### SECTION C

Section C consists of 3 questions of 3 marks each.

Q.15. Given that  $\sqrt{3}$  is irrational, prove that  $5 + 2\sqrt{3}$  is irrational.

Q.16. (A) A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.

OR

(B) The difference of two natural numbers is 5 and the difference of their reciprocals is  $1/10$ . Find the numbers.

Q.17. In a triangle, a line parallel to one side divides the other two sides. Prove these sides are divided in same ratio.



## SECTION D

Section D consists of 3 questions of 5 marks each.

Q.18. (A) For Himachal Pradesh flood victims two sections A and B of class X contributed Rs. 1,500. If the contribution of X-A was Rs. 100 less than that of X-B, find graphically the amounts contributed by both the sections.

OR

(B) Sum of the ages of a father and the son is 40 years. If father's age is three times that of his son, then find their respective ages.

Q.19. Sides AB and AC and median AD of a triangle ABC are respectively proportional to sides PQ and PR and median PM of another triangle PQR. Show that  $\triangle ABC \sim \triangle PQR$ .

Q.20. The sum of the first 7 terms of an A.P. is 49 and that of 17 terms is 289. Find the sum of the first  $n$  terms.

## SECTION E

Case study-based questions are compulsory.

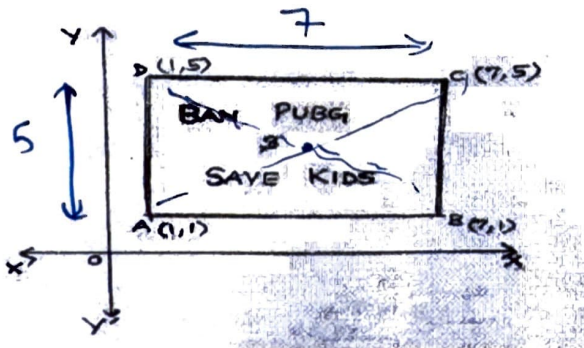
Q.21. TOWER OF PISA: To prove that objects of different weights fall at the same rate, Galileo dropped two objects with different weights from the Leaning Tower of Pisa in Italy. The objects hit the ground at the same time. When an object is dropped from a tall building, it falls about 16 feet in the first second, 48 feet in the second, and 80 feet in the third second, regardless of its weight.

(i) How many feet would an object fall in the sixth second? (1)

(ii) How many feet would an object fall in the six second? (1)

(iii) How many feet would an object fall in the eighth second and eight second? (2)

Q.22. Use of mobile screens for long hours makes our eyesight weak and give headaches. Children who are addicted to play games like PUBG on mobile phones get easily stressed out. To raise social awareness about the ill effects of playing PUBG, a school decided to start campaign, in which students are asked to prepare campaign boards in the shape of rectangle. One such campaign board made by class 10th students of the school is shown in the figure.



Based on the above information, answer the following questions,

(i) Find the coordinates of the point of intersection of diagonals AC and BD in the given rectangle. (1)

(ii) Find the length of the diagonal AC. (1)

(iii) (A) Find the area of the campaign board ABCD. (2)

OR

(B) Find the ratio of the length of the side, AB to the length of the diagonal AC. (2)

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