ITL PUBLIC SCHOOL
PERIODIC TEST 2 (2025-26)

Date: 22/09/25 | **Class: X**

MATHEMATICS (041)- SET A

Time: 3 hrs | **M. M: 80**

General Instructions:

- This Question Paper has 5 Sections A-E.
- All Questions are compulsory. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

SECTION – A

1 If HCF (98, 28) = m and LCM (98, 28) = n, then the value of is n – 7m is 1

(A) 0 (B) 28 (C) 98 (D) 198

2 The mid-point of the line segment joining the points P (−4, 5) and Q (4, 6) lies on 1

(A) x-axis (B) y-axis (C) origin (D) neither x- axis nor y - axis

3 Mode and Mean of a data are 15x and 18x respectively. Then, the Median of the data is: 1

(A) x (B) 11x (C) 17x (D) 34x

4 A card is selected at random from a deck of 52 playing cards. The probability of it being a red face card is 1

(A) $\frac{3}{13}$ (B) $\frac{2}{13}$ (C) $\frac{1}{2}$ (D) $\frac{3}{26}$

5 The quadratic equation whose roots are 7 and $\frac{1}{7}$ is: 1

(A) $7x^2 - 50x + 7 = 0$ (B) $7x^2 - 50x + 1 = 0$

(C) $7x^2 + 50x - 7 = 0$ (D) $7x^2 + 50x - 1 = 0$

6 If $\sin 30° \tan 45° = \frac{\sec 60°}{k}$ then the value of k is: 1

(A) 4 (B) 3 (C) 2 (D) 1

7 The points (5, 0), (0, 5) and (-5, 0) are the vertices of a triangle which is a/an: 1

(A) right-angled triangle (B) isosceles triangle

(C) equilateral triangle (D) scalene triangle

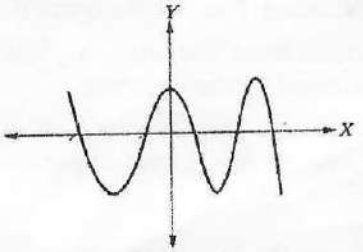
8 If $a^b = 32$ where a and b are positive integers, then the value of b^{ab} is 1

(A) 72 (B) 5^{10} (C) 2^{10} (D) 5^{12}

9 If for any event E, P(E) + P($\bar{E}$) = q, then the value of $q^2 - 3$ is: 1

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

10 The graph of y = p(x), where p (x) is a polynomial in variable x, is as follows. 1



The number of zeroes of p(x) is/are:

(A) 1

(B) 2

(C) 4

(D) 5

11 The sixth term of the A.P $\sqrt{27}, \sqrt{75}, \sqrt{147}$……is 1

(A) $\sqrt{243}$ (B) $\sqrt{363}$ (C) $\sqrt{300}$ (D) $\sqrt{507}$

12 If $x = p\cos^3 \propto$ and $y = q\sin^3 \propto$, then the value of $(\frac{x}{p})^{\frac{2}{3}} + (\frac{y}{q})^{\frac{2}{3}}$ is: 1

(A) 1 (B) 2 (C) p (D) q

13 The modal class of the given frequency distribution is: 1

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	10	13	38	30	4

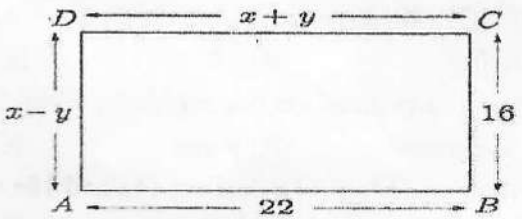
(A)50-60 (B) 40-50 (C) 30-40 (D)10-20

14 If the sum of the zeroes of the quadratic polynomial $kx^2 + 2x + 3k$ is equal to their product, then the value of k is: 1

(A) 2 (B) 3 (C) $\frac{-2}{3}$ (D) 6

15 In the figure given below, ABCD is a rectangle. The values of x and y are: 1

(A) x=22, y = 16
(B) x=16, y = 22
(C) x =3, y = 19
(D) x = 19, y = 3



16 A kite is flying at a height of 150 m from the ground. It is attached to a string inclined at an angle of 30° with the horizontal. The length of the string is: 1

(A) $100\sqrt{3}$ m (B) 300 m (C)150 m (D)$150\sqrt{3}$m

17 The pair of linear equations $9x - 15y + 19 = 0$ and $5y - 3x - 9 = 0$ represents two lines which are: 1

(A) intersecting exactly at one point (B) intersecting exactly at two points
(C) parallel (D) coincident

18 If the 23rd term of an AP exceeds its 16th term by 21, then the common difference is : 1

(A) 1 (B) 2 (C) 3 (D) 7

DIRECTION: In question number 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option.

(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.

19 **Assertion:** The probability of getting at least one tail in tossing a pair of coins is 1/4. 1

Reason: The sample space of two coin tossed is {HH, TT, HT, TH} = 4 outcomes

20 **Assertion:** The *line of sight* is the line drawn from the eye of an observer to the point in the object viewed by the observer. 1

Reason: Trigonometric ratios are used to find the height or length of an object or the distance between two distant objects.

SECTION – B

21 Solve the following system of equations algebraically: 2

$30x + 44y = 10$; $40x + 55y = 13$

OR

The cost of 2 kg apples and 1 kg grapes on a day was found to be Rs. 320.The cost of 4 kg apples and 2 kg grapes was found to be Rs.600. If cost of 1 kg of apples and 1 kg of grapes is Rs. x and Rs. y respectively, represent the given equation algebraically as a system of equations and check whether the system so obtained is consistent or not.

22 Cards numbered 1 to 30 are put in a bag. A card is drawn at random. Find the probability that the drawn card is 2

(i) prime number less than 10. (ii) a perfect square.

23 It is given that sin (A−B) = sin A cos B − cos A sin B. Use it to find the value of sin 15°. 2

OR

If in a triangle ABC right angled at B, AB = 6 units and BC= 8 units, then find the value of sin A cos C + cos A sin C.

24 The coordinates of the end points of the line segment AB are A (-2, -2) and B (2, -4). P is the point on AB such that BP = $\frac{4}{7}$ AB. Find the coordinates of point P. 2

25 By using prime factorization method, find the HCF and LCM of 72, 126 and 168. 2

SECTION – C

26 Find the zeroes of the quadratic polynomial $\sqrt{3}x^2 - 8x + 4\sqrt{3}$. Hence, verify the relationship between the zeroes and the coefficients. 3

27 If the second term of an AP is 8 and the fifth term is 17, find its nineteenth term. 3

OR

Find the middle term of the AP 213, 205, 197, ... 37.

28 Daily wages of 110 workers, obtained in a survey, are tabulated below: 3

Daily Wages (in Rs.)	100-120	120-140	140-160	160-180	180-200	200-220	220-240
Number of Workers	10	15	20	22	18	12	13

Compute the modal daily wages of these workers.

29 The numbers on a die are replaced by the first six even numbers. The die is rolled once. Find the probability that the number appearing on the die is: 3

(i) greater than 4 (ii) divisible by 3 (iii) not a multiple of 10

30 Evaluate: 3

$$\frac{3\,tan^2 30° + tan^2 60° + cosec\ 30° - \tan 45°}{cot^2 45°}$$

31 Prove that $\sqrt{3}$ is an irrational number. Hence, prove that 7-2$\sqrt{3}$ is also an irrational number. 3

SECTION – D

32 Solve the following pair of linear equations graphically: $2x + 3y = 12$; $x - y = 1$. Find the area of the region bounded by the two lines representing the above equations and y-axis. 5

OR

The ratio of incomes of two persons is 11:7 and the ratio of their expenditures is 9:5. If each of them manages to save Rs 400 per month, find their monthly incomes.

33 Medical check-up was carried out for 35 students of a class and their weights were recorded as follows: 5

Weight (in kg)	38 – 40	40 – 42	42 – 44	44 – 46	46 – 48	48 – 50	50 – 52
Frequency	3	2	4	5	14	4	3

Find the difference between the mean weight and median weight.

34 Express the equation $\frac{x-2}{x-3} + \frac{x-4}{x-5} = \frac{10}{3}$; $(x \neq 3,5)$ as a quadratic equation in standard form. Hence, find the roots of the equation so formed. 5

35 If $n \sin\theta = m \cos\theta$, then show that $\frac{m \sin\theta - n \cos\theta}{m \sin\theta + n \cos\theta} = \frac{m^2 - n^2}{m^2 + n^2}$. 5

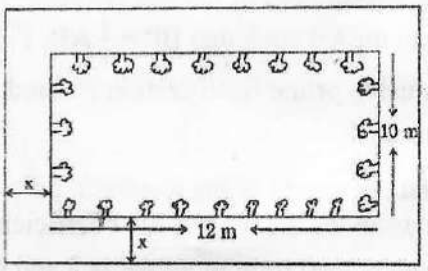
OR

Prove that $\frac{\sin A-\cos A+1}{\sin A+\cos A-1}=\frac{1}{\sec A-\tan A}$, using the identity $\sec^2 A = 1 + \tan^2 A$.

SECTION – E

36 A garden designer is planning a rectangular lawn that is to be surrounded by a uniform walkway.

The total area of the lawn and the walkway is 360 square metres. The width of the walkway is same on all sides. The dimensions of the lawn itself are 12 metres by 10 metres. Based on the information given above, answer the following questions:



(i) Formulate the quadratic equation representing the total area of the lawn and the walkway, taking width of walkway = x m. 1

(ii) Find the perimeter of the lawn. 1

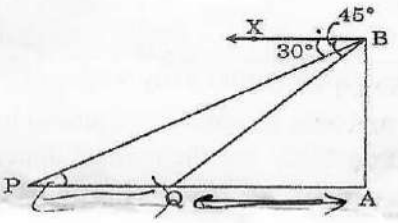
(iii) Solve the quadratic equation to find the width of the walkway 'x'. 2

OR

If the cost of paving the walkway at the rate of is 50 per square metre is Rs. 12,000, calculate the area of the walkway.

37 A lighthouse stands tall on a cliff by the sea, watching over ships that pass by. One day a ship is seen approaching the shore and from the top of the lighthouse, the angles of depression of the ship are observed to be 30° and 45° as it moves from point P to point Q. The height of the lighthouse is 50 metres.

Based on the information given above, answer the following questions



(i) Find the distance of the ship from the base of the lighthouse when it is at point Q, where the angle of depression is 45°. 1

(ii) Find the measures of ∠PBA and ∠QBA. 1

(iii) Find the distance travelled by the ship between points P and Q. 2

OR

If the ship continues moving towards the shore and takes 10 minutes to travel from Q to A, calculate the speed of the ship in km/h, from Q to A.

38 A school is organizing a charity run to raise funds for a local hospital. The run is planned as a series of rounds around a track, with each round being 300 metres. To make the event more challenging and engaging, the organizers decide to increase the distance of each subsequent round by 50 metres. For example, the second round will be 350 metres, the third round will be 400 metres and so on. The total number of rounds planned is 10.

Based on the information given above, answer the following questions:

(i) Write the fourth and sixth term of the Arithmetic Progression so formed. 1

(ii) Determine the distance of the 8th round. 1

(iii) Find the total distance run after completing all 10 rounds. 2

OR

If a runner completes only the first 6 rounds, what is the total distance run by the runner?