THE INDIAN HIGH SCHOOL, DUBAI

PERIODIC TEST-3 2025-26

DATE: 27.11.2025 | **DURATION: 3 hours**

GRADE :10 | **MATHEMATICS** | **MARKS: 80**

General Instructions:

1. The question paper contains 38 questions. **All** questions are **compulsory**
2. This Question Paper has 5 Sections A-E
3. Section A has 20 MCQs carrying 1 mark each.
4. Section B has 5 questions carrying 2 marks each.
5. Section C has 6 questions carrying 3 marks each.
6. Section D has 4 questions carrying 5 marks each.
7. Section E has 3 case based integrated units of assessment (4 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 1 question of 2 marks, 3 marks and 5 marks each has been provided.
9. Draw neat figures wherever required.

SECTION – A

Section A consists of 20 questions of 1 mark each.

1. The quadratic equation whose sum and product of roots are 'a' and '$\frac{1}{a}$' respectively is

   a) $ax^2 - ax + 1 = 0$ b) $ax^2 - a^2x + 1 = 0$

   c) $ax^2 + ax + 1 = 0$ d) $ax^2 + a^2x - 1 = 0$

2. If LCM of 51 and 85 can be expressed in the form of $6z - 9$, then find the value of z is

   a) 44 b) 56 c) 62 d) 40

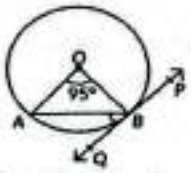
3. The value of k for which the pair of equations $kx = y + 2$ and $6x = 2y + 3$ has infinitely many solutions

   a) $k = 3$ b) doesn't exist c) $k = -3$ d) $k = 4$

4. If x, $2x + 9$, $4x + 3$ are three consecutive terms of AP, then the value of x is

   a) 3 b) 10 c) 13 d) 15

5. In the given figure, PQ is tangent to the circle centered at O. if $\angle AOB = 95°$, then the measure of $\angle ABQ$ will be



   a) 47.5° b) 42.5° c) 85° d) 95°

6. If the value of each observation of a statistical data is increased by 3, then the mean of the data

   a) remains unchanged b) increases by 3 c) increase by 6 d) increases by $3n$

7. All queens, jacks and aces are removed from a pack of 52 cards. The remaining cards are well-shuffled, and one card is picked up at random from it. The probability of that card to be king is

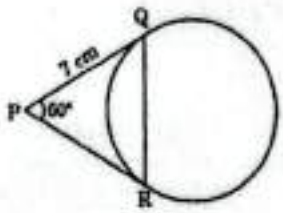
   a) $\frac{1}{10}$ b) $\frac{1}{13}$ c) $\frac{3}{10}$ d) $\frac{3}{13}$

8. The fourth vertex of D of a parallelogram ABCD whose three vertices are A (-2, 3), B (6, 7) and C (8, 3) is

   a) (0, 1) b) (0, -1) c) (-1, 0) d) (1, 0)

a) 1 b) 2 c) -2 d) -1

10. In the given figure, PQ and PR are tangents to the circle such that PQ = 7 cm and $\angle RPQ = 60°$. The length of chord QR is



a) 5 cm b) 7cm c) 9cm d) 14cm

11. The probability of getting a bad egg in a lot of 400 eggs is 0.045. The number of good eggs in the lot is

a) 18 b) 180 c) 382 d) 220

12. The value of $\frac{\sin 60°}{\cos 30°}$ is equal to equal to

a) 0 b) $\sqrt{3}$ c) 1/2 d) 1

13. The ratio in which x-axis divides the line segment joining A (2, -3) and B (5, 6) is

a) 3:5 b) 1:2 c) 2:1 d) 2:3

14. From the solid right circular cylinder with height 10cm and radius of the base 6cm, a right circular cone of the same height and same base is removed, then the volume of remaining solid is

a) 280π cm^3 b) 240π cm^3 c) 330π cm^3 d) 204π cm^3

15. Consider the frequency distribution of 45 observations

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	9	15	10	6

The upper class of median class is

a) 20 b) 10 c) 30 d) 40

16. The length of the tangent drawn from point P, whose distance from the center of a circle is **25cm**, and the radius of the circle is **7cm** is

a) 22 cm b) 24cm c) 25cm d) 28cm

17. The area of the sector of radius **6cm** is **60cm²**. The length of the corresponding arc (in cm) is

a) 20 b) 60 c) 80 d) 100

18. A cylinder, a cone and a hemisphere have same base and same height, then the ratio of their volume is

a) 1:1:1 b) 1:2:3 c) 2:3:1 d) 3:1:2

DIRECTION: In question numbers 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 (A):** In two concentric circles, the chord of the larger circle, which touches the smaller circle, is bisected at the point of contact.

Reason (R): The lengths of tangents drawn from an external point to a circle are equal

Assertion (A): Assertion (A): The quadratic equation $x^2 + 4x + 5 = 0$ has real roots.

Reason (R): The quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$ has real roots if $b^2 - 4ac \geq 0$

SECTION – B

Section- B consists of 5 questions of 2 marks each.

21. (a) Find A and B if $\tan(A + B) = \sqrt{3}$ and $\tan(A - B) = \frac{1}{\sqrt{3}}$, $0° < A + B < 90°$, $A > B$

OR

(b) Evaluate $\frac{\tan^2 60°}{2\sin^2 60° + \cos^2 30°}$

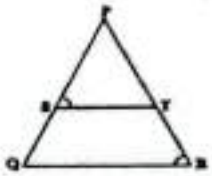
22. Prove that A (4,3), B (6,4), C (5,6), D (3,5) are the vertices of a Square ABCD.

23. Three bells toll at intervals of 9, 12 and 15 minutes respectively. All the three begin to toll at 8 a.m. At what time will they toll together again?

24. (a) E is a point on the side AD produced of a Parallelogram ABCD and BE intersects CD at F. Show that $\triangle ABE \sim \triangle CFB$

OR

(b) In the given figure, if $\frac{PS}{SQ} = \frac{PT}{TR}$ and $\angle PST = \angle PRQ$. Prove that PQR is an isosceles triangle.



25. One card is drawn at random from a well shuffled deck of 52 cards. Find the probability that the card drawn
    (i) a queen of hearts.
    (ii) not a jack.

SECTION-C

Section C consists of 6 questions of 3 marks each.

26. (a) If the zeroes of the polynomial $x^2 + px + q$ are double in value to the zeroes of $2x^2 - 5x - 3$, then find the values of p and q

OR

(b) α, β are the zeroes of the quadratic polynomial $P(x) = x^2 - 4x + k$, such that $\alpha - \beta = 8$. Find the value of k.

27. Prove that number $\frac{2-\sqrt{3}}{5}$ is an irrational number, given that $\sqrt{3}$ is an irrational number.

28. A train travels 300km at a constant speed. If the train speed is increased by 5km/h, the journey will take 2 hours less. Find the speed of the train?

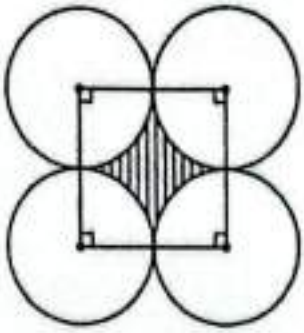
29. State and Prove Basic Proportionality theorem.

30. Prove that $\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta} = 1 + \sec\theta \operatorname{cosec}\theta$

31. (a) In a circle of radius 21cm, an arc subtends an angle of $60°$ at the centre.
    (i) Find the length of the arc. (ii) Find area of sector formed by the minor arc

OR

(b) Find the area of the shaded region if length of radius of each circle is 7 cm. Each circle touche the other two externally.



SECTION – D

Section D consists of 4 questions of 5 marks each.

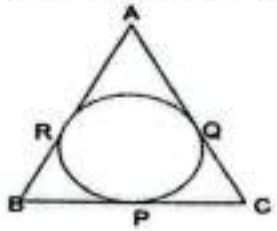
32. Solve graphically the pair of linear equations $3x - 4y + 3 = 0$ and $3x + 4y - 21 = 0$ Find the coordinates of vertices of triangular region formed by these lines and x-axis. Also calculate the area of this triangle.

33. (a) As observed from the top of a lighthouse, 100 m above sea level, the angle of depression of a ship, sailing directly towards it, changes from 30° to 60°. Determine the distance travelled by the ship during the period.

OR

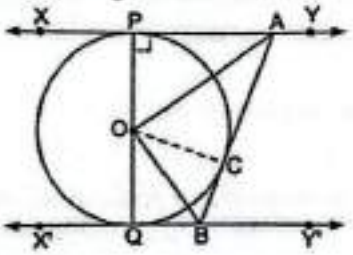
(b) Two poles of equal heights are standing opposite each other on either side of the road, which is 80 m wide. From a point between them on the road, the angles of elevation of the top of the poles are 60° and 30°, respectively. Find the height of the poles and the distances of the point from the poles.

34. (a) Prove that the lengths of tangents drawn from an external point to a circle are equal. Using above result, find the length BC of ΔABC. Given that, a circle is inscribed in ΔABC touching the sides AB, BC and CA at R, P and Q respectively and AB= 10 cm, AQ=7cm CQ= 5cm.



OR

(b) **In Fig, XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY at A and X'Y' at B. Prove that $\angle AOB = 90°$.**



35. The median of the following distribution is 545. If the sum of all frequencies is 100, then find the values of x and y.

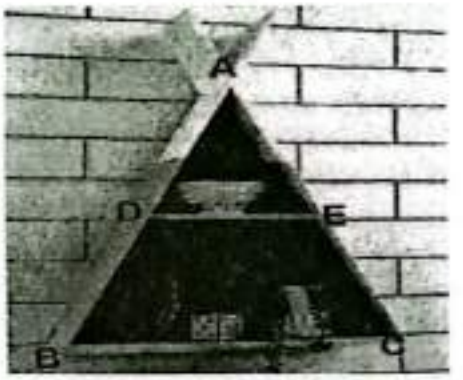
Class	Frequency
0-100	3
100-200	4
200-300	5
300-400	x
400-500	17
500-600	20
600-700	19
700-800	y
800-900	8
900-1000	3

SECTION – E

Section E consists of 3 questions of 4 marks.

Case-study- 1

36. While browsing through the catalogue of wooden shelves, Karthik came across this beautiful triangular shaped shelf. In the shelf, DE is parallel to the base BC could be used for displaying small plants and showpieces.



(i) Find the relation between the sides AD, DB, AE and EC. Also, mention the theorem used.

(ii) With measurement AE = 1.8 cm, BD = 7.2 cm and CE = 5.4 cm.

Karthik thought of finding the length of side AD from the given figure of shelf. How he will find the length.

(iii) (a) Find the value of x if AD = (x + 3) cm, BD = (3x + 19) cm, AE = x cm and EC = (3x + 4) cm.

OR

(iii) (b) If AB = 9 cm, AC = 18 cm, AD = 2 cm and AE = 4 cm, then prove that DE || BC.

Case Study- 2

37. Metallic silos are used by farmers for storing grains. Farmer Girdhar has decided to build a new metallic silo to store his harvested grains. It is in the shape of a cylinder mounted by a cone.

Dimensions of the conical part of a silo is as follows:
Radius of base = 1.5 m
Height = 2 m
Dimensions of the cylindrical part of a silo is as follows:
Radius = 1.5 m
Height = 7 m
Based on the above information, answer the following questions.

(i) Calculate the slant height of the conical part of one silo.

(ii) Find the curved surface area of the conical part of one silo.

(iii) (a) Find the cost of metal sheet used to make the curved cylindrical part of 1 silo at the rate of ₹2000 per m^2.

OR

(iii) (b) Find the total capacity of one silo to store grains.

Case Study- 3

38. A school auditorium has to be constructed with a capacity of 2000 people. The chairs in the auditorium are arranged in a concave shape facing towards the stage in such a way that each succeeding row has 5 seats more than the previous one.

(i) If the first row has 15 seats, then how many seats will be there in 12th row?

(ii) If there are 15 rows in the auditorium, then how many seats will be there in the middle row?

(iii) (a) If total 1875 guests were there in the auditorium for a particular event; then how many rows will be needed to make all of them sit?

OR

(iv) (b) If total 1250 guests were there in the auditorium for a particular event, then how many rows will be left blank out of total 30 rows?