OUR OWN HIGH SCHOOL, DUBAI

Half Yearly Examination– November 2025

Name: _____ **Grade: ___Sec: __**

Subject: MATHEMATICS **M Marks: 80**

Date: 11/ 11 / 2025 **Duration: 3 hours**

General Instructions:

1. This question paper has 8 pages.
2. Reading time is 15 minutes
3. All questions are compulsory.
4. This Question Paper is divided into 5 Sections A, B, C, D and E.
5. In Section A, Question numbers 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.
6. In Section B, Question numbers 21-25 are very short answer (VSA) type questions, carrying 2 marks each..
7. In Section C, Question numbers 26-31 are short answer (SA) type questions, carrying 3 marks each.
8. In Section D, Question numbers 32-35 are long answer (LA) type questions, carrying 05 marks each.
9. In Section E, Question numbers 36-38 are case study-based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
10. There is no overall choice. However, an internal choice in 2 questions of Section B, 2 questions of Section C and 2 questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
11. Draw neat and clean figures wherever required. Take $\pi = \frac{22}{7}$ wherever required if not stated.

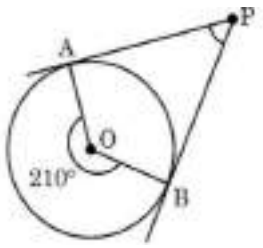
Section A
Section A consists of 20 questions of 1 mark each.

1. The midpoint of the 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.

2. If $x = ab^3$ and $y = a^3b$,where a and b are prime numbers, 1
then [HCF (x, y)– LCM (x, y)] is equal to
(A) $1 - a^3b^3$ (B) $ab(1 - ab)$ (C) $a^3b^3 - 1$ (D) $ab(1–a^2\ b^2)$

3. In the adjoining figure, PA and PB are tangents 1
to a circle with centre O. The measure of $\angle APB$ is

(A) 210^0 (B) 150^0 (C) 105^0 (D) 30^0



4. The value of k for which the system of equations $3x - ky = 7$and $6x + 10y = 3$ is inconsistent, is 1

(A) -10 (B) -5 (C) $\neq 5$ (D) = 5

5. If $\sin(\alpha + \beta) = 1$, then the value of $\sin\left(\frac{\alpha+\beta}{2}\right)$ is 1

(A) $\frac{1}{\sqrt{2}}$ (B) $\frac{1}{2}$ (C) 0 (D) 1

6. 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) $7x^2 + 50x - 1 = 0$

7. A peacock sitting on the top of the tree of height 10 m observes a snake moving on the ground. If the snake is $10\sqrt{3}$ m away from the base of the tree, then the angle of depression of the snake from the eye of the peacock is 1

(A) 30^0 (B) 60^0 (C) 90^0 (D) 45^0

8. If n^{th} term of an A P is 7n-4, then the common difference of the AP is 1

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

9. If $sin30^0 \tan 45^0 = \frac{\sec 60^0}{k}$, then the value of k is 1

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

10. Which of the following cannot be the unit digit of 8^n where n is a natural number? 1

(A) 4 (B) 2 (C) 6 (D) 0

11. The curved surface area of a cone with base radius 7 cm, is 550 cm^2. The slant height of the cone is: 1

(A)25 cm (B) 14cm (C) 20 cm (D) 24 cm

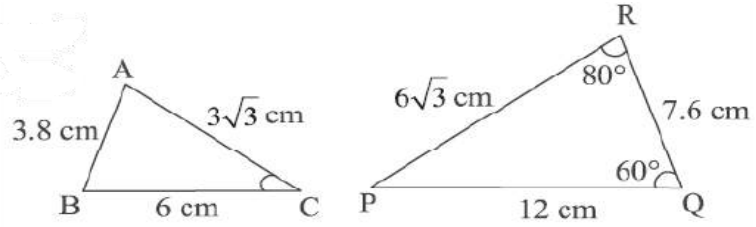
12. If α and β are the zeroes of the polynomial p(x)= $kx^2 - 30x + 45k$ and $\alpha + \beta = \alpha\beta$, then the value of k is 1

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

13. The length of the minute hand of a clock is 6cm. The area swept by the minute hand in 10 minutes is 1

(A) 2π cm^2 (B) 6π cm^2 (C) $36\ \pi$ cm^2 (D) 42π cm^2

14. ΔABC and ΔPQR, are shown in the adjoining figures. The measure of ∠C is 1



(A) 140^0 (B) 80^0 (C) 60^0 (D) 40^0

15. Three distinct coins are tossed together. The probability of getting at least 2 heads is 1

(A) $\frac{3}{8}$ (B) $\frac{3}{4}$ (C) $\frac{7}{8}$ (D) $\frac{1}{2}$

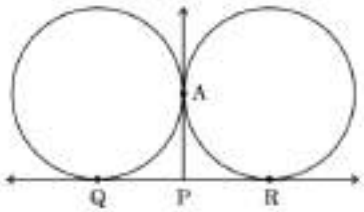
16. A point on x axis divides the line segment joining the points A(2, -3) and B(5, 6) in the ratio 1:2. The point is 1

(A) (4,0) (B) $(\frac{7}{2}, \frac{3}{2})$ (C) (3,0) (D) (0,3)

17. The mode and median of given set of observation are 13 and 11 respectively, then the mean is 1

(A) 17 (B) 7 (C) 10 (D) 28

18. **1**



In the given figure, QR is a common tangent to the two given circles touching externally at A. The tangent at A meets QR at P. If AP = 4.2 cm, then the length of QR is

(A) 4.2 cm (B) 2.1cm (C) 6.3 cm (D) 8.4 cm

DIRECTIONS: 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): The probability of selecting a number at random from the numbers 1 to 20 is 1. 1

Reason (R): For any event E, if P(E) =1, then E is called a sure event.

20. Assertion (A): If a cone of greatest possible volume is hallowed out from a solid wooden cylinder, then the ratio of the remaining volume of wood to the volume of the cone hollowed out is 2:1 1
Reason (R) : Th volume of a cone having the same base radius and height as that of the cylinder is $\frac{1}{3}\ \pi r^2 h$.

Section B

Section B consists of 5 questions of 2 marks each.

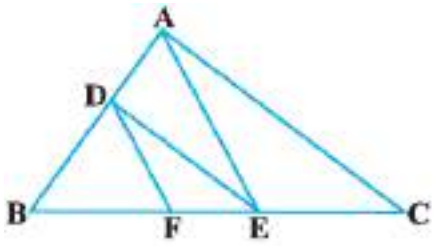
21.(a) Find the 11th term from the last term of the AP : 10, 7, 4, . . ., – 62. 2

OR

(b) The first term of an AP is 5, the last term is 45 and the sum is 400. Find the number of terms and the common difference.

22. A point 'P' is equidistant from points with coordinates A(7,1) and B(3,5) . Prove that abscissa of a point P is 2 more than it's ordinate. 2

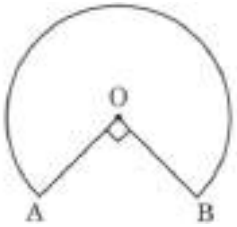
23. In the given Fig: DE || AC and DF || AE. 2
Prove that $\frac{BF}{FE} = \frac{BE}{EC}$



24.(a) In the given figure, three sectors of a circle of radius 5cm, making angles of 35^0, 50^0 and 95^0 at the centre are shaded. Find the area of the shaded region. [Use $\pi = \frac{22}{7}$] 2

OR

(b) In the given figure, the shape of the top of a table is that of a sector of a circle with centre O and ∠AOB = 90^0.
If AO= OB = 42 cm,find the perimeter of the top of the table.



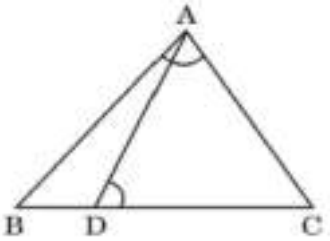
25. Prove that the lengths of tangents drawn from an external point to a circle are equal in length. 2

Section C

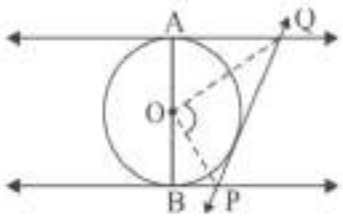
Section C consists of 6 questions of 3 marks each.

26. In a students' workshop, the number of students learning French, Hindi and Arabic are 48, 144 and 80 respectively. Find the minimum number of rooms required if in each room the same number of students are seated and all of them are of the same subjects. 3

27. In the given figure, D is a point on the side BC of a ΔABC such that $\angle ADC = \angle BAC$. Show that $CA^2 = CD.CB$ 3

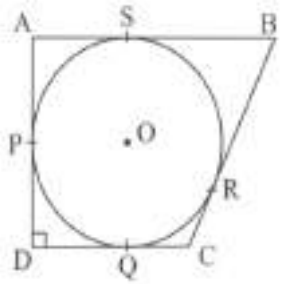


28.(a) In the given figure, AB is a diameter of the circle with centre O. AQ, BP and PQ are tangents to the circle. Prove that $\angle POQ = 90^0$ 3



OR

(b) A circle with centre O and radius 8cm is inscribed in a quadrilateral ABCD in which P, Q, R, and S are points of contact as shown. If AD is perpendicular to DC, BC= 30 cm and BS = 24 cm, find the length of DC.



29. Prove that: 3

(a) $\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta} = \tan\theta$

OR

(b) $\frac{\sin A + \cos A}{\sin A - \cos A} + \frac{\sin A - \cos A}{\sin A + \cos A} = \frac{2}{2\sin^2 A - 1}$

30. Obtain the zeroes of the polynomial $7x^2 + 18x - 9$. Hence write a polynomial whose zeroes are twice the zeroes of given polynomials. 3

31. All red face cards are removed from a pack of playing cards. The remaining cards were well shuffled and then a card is drawn at random from them. 3
Find the probability that the drawn card is:

a) a red card b) a face card c) a card of club.

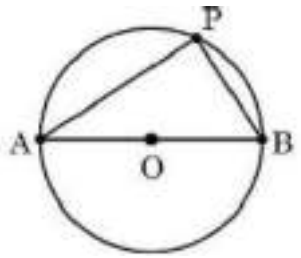
Section D

Section D consists of 4 questions of 5 marks each.

32. Check whether the following system of equations is consistent or not. If consistent, solve it graphically. 5

$$x + 3y = 6, \quad 2x - 3y = 12.$$

33.(a) A pole has to be erected at a point on the boundary of a circular park of diameter 13 metres in such a way that the differences of its distances from two diametrically opposite fixed gates A and B on the boundary is 7 metres. Is it possible to do so? If yes, at what distances from the two gates should the pole be erected? 5



OR

(b) A train travels at distance of 480 km at a uniform speed. If the speed had been 8 km/h less, then it would have taken 3 hours more to cover the same distance. Find the speed of the train.

34. A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top, which is open, is 5 cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, one-fourth of the water flows out. Find the number of lead shots dropped in the vessel. 5

35.(a) Find the Mean and Mode of the following data: 5

Class	Frequency
$4 - 8$	2
$8 - 12$	12
$12 - 16$	15
$16 - 20$	25
$20 - 24$	18
$24 - 28$	12
$28 - 32$	13
$32 - 36$	3

OR

(b) Following data shows the number of family members living in different bungalows of a locality:

Number of members	$0 - 2$	$2 - 4$	$4 - 6$	$6 - 8$	$8 - 10$	Total
Number of Bungalows	10	P	60	q	5	120

If the median number of members is found to be 5, find the values of p and q.

Section E

Section E consists of 3 questions of 4 marks each.

36. To inculcate the good habit of savings in her children, Reema brought a piggy bank and after putting a ₹ 10 coin in it, she handed it over to her daughter Amisha and asked as to put money in it from her pocket money at the beginning of every week. Amisha put two ten-rupee coins at the beginning of next (second) week and in this way increases her savings by one ₹ 10 coin every week. 4

Based on the above, answer the following questions:

(i) How many coins were added in the piggy bank at the beginning of 5th week?

(ii) How many ₹ 10 coins will be there in the piggy bank after the end of 7 weeks?

(iii)(a). If the piggy bank can hold a maximum of 300 ₹ 10 coins, after how many weeks would it be full?

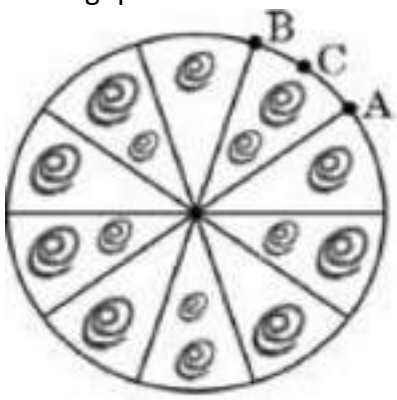
OR

(b). Find the total amount of money in the piggy bank at the end of 20 weeks.

37. A brooch is a decorative piece often worn on clothing like jackets, blouses or dresses to add elegance. Made from precious metals and decorated with gemstones, brooches come in many shapes and designs. 4

One such brooch is made with silver wire in the form of a circle with diameter 35 mm as shown in the figure. The wire is also used in making 5 diameters which divide the circle into 10 equal sectors as shown in the figure.

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



(i) Find the central angle of each sector.

(ii) Find the length of the are ACB.

(iii) (a). Find the area of each sector of the brooch.

OR

(b). Find the total length of the silver wire used.

38. The Statue of Unity situated in Gujarat is the world's largest Statue which stands over a 58 m high base. As part of the project, a student constructed an inclinometer and wishes to find the height of the Statue of Unity using it. He noted following observations from two places: 4

Situation – I :
The angle of elevation of the top of Statue from Place A which is 80√3 m away from the base of the Statue is found to be 60°.

Situation – II :
The angle of elevation of the top of Statue from a Place B which is 40 m above the ground is found to be 30° and entire height of the Statue including the base is found to be 240 m.

Based on the information given, answer the following questions:

(i) Represent the **Situation – I** with the help of a diagram.

(ii) Represent the **Situation – II** with the help of a diagram.

(iii)(a). Calculate the height of the statue excluding the base and also find the height including the base with the help of **Situation – I**

OR

(b). Find the horizontal distance of point B **(Situation – II)** from the statue and the value of $\tan\theta$,where θ is the angle of elevation of the top of the statue from the point B

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