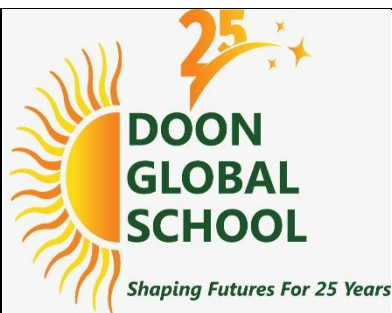




DOON GLOBAL SCHOOL
PRE-BOARD-II EXAMINATIONS (2024-25)

CLASS – X

SUBJECT- MATHEMATICS

SUBJECT CODE- 041

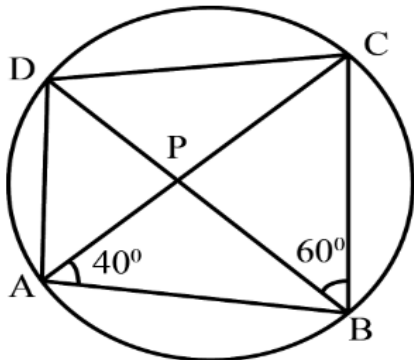
TIME – 3Hrs

M. M- 80

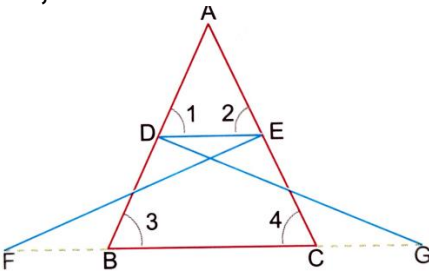
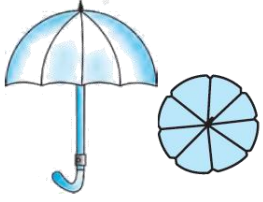
INSTRUCTIONS:

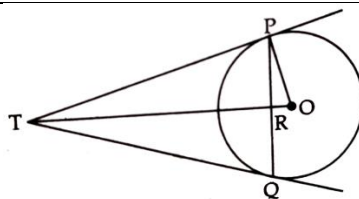
1. This question paper contains- five sections A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.
 2. Section A has 20 MCQs carrying 1 mark each.
 3. Section B has 5 questions of 2 marks each.
 4. Section C has 6 questions of 3 marks each.
 5. Section D has 4 questions of 5 marks each.
- 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.

	SECTION-A Section A consist of 20 questions of 1 mark each	
1.	If the sum of zeroes of the quadratic polynomial $3x^2 - kx + 6$ is 3, then the value of k is (a) 9 (b) -9 (c) -8 (d) 8	1
2.	The graph of $x = -2$ is a line parallel to the (a) X-axis (b) y-axis (c) both axis (d) none of these	1
3.	If the number a, b, c, d, e forms an A.P, then the value of $a - 4b + 6c - 4d + e$ is (a) 1 (b) 2 (c) 0 (d) None of these	1
4.	The length of a tangent drawn from a point at a distance of 10 cm of circles is 8 cm. The radius of the circle is (a) 4 cm (b) 5 cm (c) 6 cm (d) 7 cm	1
5.	If $\operatorname{cosec} \theta - \cot \theta = \frac{1}{4}$ then $\operatorname{cosec} \theta + \cot \theta =$ (a) 1 (b) 2 (c) 3 (d) 4	1
6.	Area of the largest triangle that can be inscribed in a semi- circle of radius r units is (a) $r^2 \text{sq. units}$ (b) $\frac{1}{2} r^2 \text{sq. units}$ (c) $2r^2 \text{sq. units}$ (d) $\sqrt{2} r^2 \text{sq. units}$	1
7.	In the given figure, ABCD is a cyclic quadrilateral whose diagonals intersect at P such that $\angle DBC = 60^\circ$ and $\angle BAC = 40^\circ$, then find $\angle BCD$.	1

	 (a) 110° (b) 70° (c) 80° (d) 90°	
8.	If α and β are the zeros of the polynomial $x^2 - 1$ then value of $(\alpha + \beta)$ is: (a) 2 (b) 1 (c) -1 (d) 0	1
9.	Which of the following is not a measure of central tendency? (a) Mean (b) Median (c) Class Interval (d) Mode	1
10.	If in triangles ABC and DEF, $\frac{AB}{DE} = \frac{BC}{FD}$, then they will similar if (a) $\angle B = \angle E$ (b) $\angle A = \angle D$ (c) $\angle A = \angle F$ (d) $\angle B = \angle D$	1
11.	The nature of the roots of $\sqrt{5}x^2 - \sqrt{3}x - \frac{1}{\sqrt{5}} = 0$ (a) Real and distinct (b) Real and repeated (c) Not real (d) 8	1
12.	If $\operatorname{Cosec} \theta = \frac{5}{3}$ and then what is the value $\cos \theta + \tan \theta$ (a) $\frac{31}{20}$ (b) $\frac{13}{20}$ (c) $\frac{16}{13}$ (d) $\frac{20}{13}$	1
13.	If the radius of the base of a right circular cylinder is halved, keeping the height same, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is (a) 1 : 2 (b) 2 : 1 (c) 1 : 4 (d) 4 : 1	1
14.	If the points A (6,1), B (8,2), C (9,4) and D (p, 3) are the vertices of a parallelogram, taken in order then the value of p is (a) 4 (b) -6 (c) 7 (d) -2	1
15.	In a survey, it is found that every fifth person has a vehicle. The probability of a person not having a vehicle, is (a) $\frac{1}{5}$ (b) $\frac{2}{5}$ (c) $\frac{4}{5}$ (d) $\frac{7}{5}$	1
16.	If the value of each observation of a statistical data is increased by 3, then the mean of the data is (a) Remains unchanged (b) increases by 3 (c) increases by 6 (d) increase by 3n	1
17.	The distance between the points P (1, 4) and Q (4, 0) is (a) 4 (b) 5 (c) 6 (d) 3	1
18.	If the probability of a player winning a game is 0.79, then the probability of his losing the same game is	1

	(a)1.79 (b)0.31 (c)0.21% (d) 0.21	
	DIRECTIONS: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R) 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 H.C.F of two numbers is 16 and their product is 3072, then their L.C.M =162. Reason (R): If a and b are two positive integers then $HCF \times LCM = a \times b$	1
20.	Assertion (A): Two circle touch internally. The sum of their area is $116 \pi cm^2$ and the distance between their centres is 6cm. Then, radii of the circles are 4cm and 10 cm. Reason (R): When two circles touch internally, then difference of their radii is equal to distance between centers.	1
	SECTION-B	
	Section B consist of 5 questions of 2 marks each.	
21.	The LCM of two numbers is 14 times their HCF. The sum of LCM and HCF is 600, if one number is 280, then find the other numbers. OR Three bulbs red, green and yellow flash at intervals of 80 seconds, 90 sec and 110 sec. All three flash together at 8:00 am. At what time will the three bulbs flash altogether again?	2
22.	If $\tan \theta + \frac{1}{\tan \theta} = 2$, find the value of $\tan^2 \theta + \frac{1}{\tan^2 \theta}$	2
23.	(A) Two dice are thrown at the same time and the product of numbers appearing on them is noted. Find the probability that the product is a prime number. OR (B) A game consists of tossing a coin three times and noting the outcomes each time. If getting the same result in all the tosses is a success, find the probability of losing the game.	2
24.	Find the coordinates of a point A, where AB is the diameter of circle whose Centre O (2, -3) and B (1,4).	2
25.	The x- co-ordinate of a point P is twice its y-coordinate. If P is equidistant from points Q (2, - 5) and R (-3, 6), find the co-ordinates of P.	2
	SECTION-C	
	Section C consist of 6 questions of 3 marks each.	
26.	(A) If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.	3

	OR (B) In fig $\triangle FEC \cong \triangle GDB$ and, $\angle 1 = \angle 2$. Prove that $\triangle ADE \sim \triangle ABC$. 	
27.	Find a, b and c if it is given that the numbers a, 7, b, 23, c is in AP.	3
28.	If α and β are the zeros of a quadratic polynomial such that $\alpha + \beta = 24$ and $\alpha - \beta = 8$ find a quadratic polynomial having α and β as its zeros.	3
29.	If $\tan(A - B) = \frac{1}{\sqrt{3}}$, $\tan(A + B) = \sqrt{3}$, $0 < A + B \leq 90^\circ$, $A > B$. Find $\angle A$ and $\angle B$.	3
30.	Prove that $5 - 2\sqrt{3}$ is an irrational number, given that $\sqrt{3}$ is an irrational number.	3
31.	(A) Ram bought a pendulum clock for his new house. The minute hand and hour hand of the clock are 9cm and 6cm long respectively. Find the area swept by the minute hand in 10 min. Also find the area swept by hour hand between 11 am and 5. 00 pm OR (B) An umbrella has 8 ribs which are equally spaced. Assuming umbrella to be a flat circle of radius 45 cm, find the area between the two consecutive ribs of the umbrella. 	3
	SECTION-D	
	Section D consist of 4 OR questions of 5 marks each	
32.	(A) A two-digit number is such that the product of its digits is 14. When 45 is added to the number, the digits interchange their places, find the numbers. OR (B) The ship covered a certain distance at a uniform speed. If the speed of ship would have been 6km/h faster, it would have taken 4 hours less than the scheduled time. And if the speed of ship were slower by 6km/h, it would have taken 6 hours more than the scheduled time. Find the length of the journey.	5
33.	(A) From a point T outside a circle of centre O, tangents TP and TQ are drawn to the circle. Prove that OT is the right bisector of line segment PQ. OR (B) In figure PQ is a chord of length 16 cm, of a circle of radius 10 cm. The tangents at P and Q intersect at a point T. Find the length of TP.	5



34. The angle of elevation of the top Q of a vertical tower PQ from a point X on the ground is 60° . From a point Y, 40 m vertically about X, the angle of elevation of the top Q of tower is 45° . Find the height of the tower PQ and the distance PX. Also find the length of QX.

5

35. Find the median and mode of the following data.

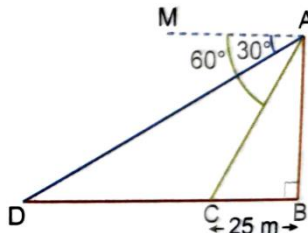
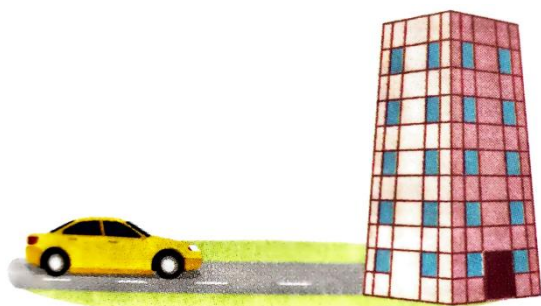
CLASS INTERVAL	0-10	10-20	20-30	30-40	40-50
FREQUENCY	8	16	36	34	6

SECTION-E

Section E consist of 3 case study-based questions of 4 marks each

36. Rohit is standing at the top of a building and observes a car at an angle of depression of 30° as it approaches the base of the building at a uniform speed. 6 seconds later, the angle of depression increases to 60° , and at that moment, the car is 25 m away from the building.

4



Based on the above information, answer the following question:

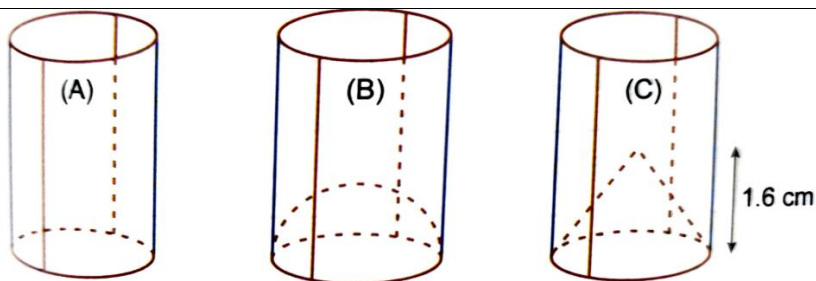
- What is the height of the building?
- What is the distance between two positions of the car?
- (a) What would be the total time taken by the car to reach the foot of the building from starting point?

OR

- What is the distance of the observer from the car when it makes an angle of 60° .

37. Pinky's class teacher explained the benefits of drinking fruit juice in the morning to the students. Inspired by this Pinki went to a juice stall with her friend Bipin. At the stall, they noticed that the shopkeeper had three types of glasses each with an inner diameter of 4.6 cm, to serve customers. The height of each glass was 11 cm. Observing this a few questions came to their mind. which glass minimum capacity.

4



Based on the above answer the following question:

- (i) What is the volume of type(A) glass?
- (ii) What is the volume of type (B) glass?
- (iii) (a) How much more juice can be filled in type (A)glass than glass of type(C)?

OR

- (b) Which glass has minimum capacity?

38. Your friend Keshav wants to participate in a 200 m race. He can currently run that distance in 51 seconds and with each day of practice it takes him two seconds less. He wants to complete the race in 31 second.

Based on the above information, answer the following questions:

- (i) Write AP for the given situation. (1)
- (ii) What is the minimum number of days he needs to practice till his goal is achieved. (1)
- (iii) (a) If nth term of an A.P is given $a_n = 2n + 3$ then find the common difference the AP. (2)

OR

- (b) Find the value of n for which $2n$, $n + 10$ and $3n + 2$ are three consecutive terms of the AP

4

