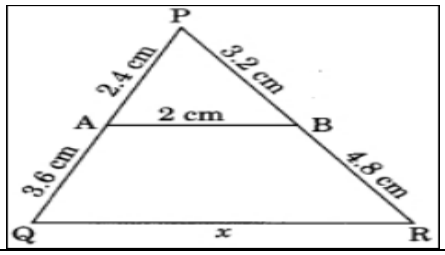
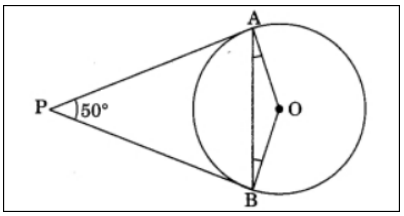
KENDRIYA VIDYALAYA SANGATHAN, GURUGRAM REGION
PRE-BOARD EXAMINATION, 2025-26

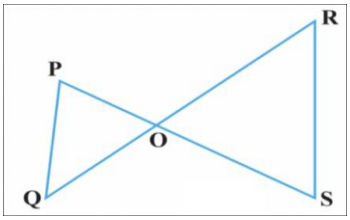
CLASS:- X **MAXIMUM MARKS:- 80**
SUBJECT:- MATHEMATICS (BASIC) **TIME:- 3 HRS**

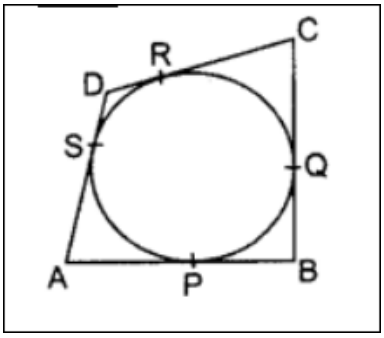
General Instructions:

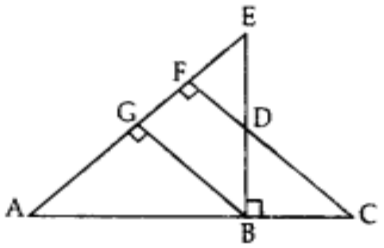
1. This Question Paper has 5 Sections A, B, C, D, and E.
2. Section A has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.
3. Section B has 5 Very Short Answer type questions carrying 2 marks each.
4. Section C has 6 Short Answer type questions carrying 3 marks each.
5. Section D has 4 Long Answer type questions carrying 5 marks each.
6. 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.
7. All Questions are compulsory. However, an internal choice in 2 Questions of 2 marks, 2 Questions of 3 marks and 2 Questions of 5 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
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.	
1	The product of three consecutive positive integers is divisible by (a) 4 (b) 6 (c) no common factor (d) only 1	1
2	The largest number that will divide 398, 436 and 542 leaving remainders 7,11 and 15 respectively is: (a) 17 (b) 11 (c) 34 (d) 45	1
3	The zeroes of the quadratic polynomial $x^2 + 99x + 127$ are (a) both positive (b) both negative (c) one positive and one negative (d) both equal	1
4	If x = a, y = b is the solution of the equations x + y = 5 and 2x – 3y = 4, then the values of a and b are respectively (a) 6, -1 (b) 2, 3 (c) 1, 4 (d) 19/5, 6/5	1
5	A Quadratic equation has: (a) at most two roots (b) at least two roots (c)exactly two roots (d) at least one roots	1

6	In the given figure, value of x (in cm) is (a) 5cm (b) 4cm (c)) 6cm (d) 8cm  	1
7	The distance between the points A (0, 6) and B (0, -2) is (a) 6 (b) 8 (c) 4 (d) 2	1
8	In which ratio the y-axis divides the line segment joining the points (5, – 6) and (–1,4)? (a) 1 :5 (b) 5:1 (c) 1 :1 (d) 1 :2	1
9	In Fig., if PA and PB are tangents to the circle with centre 0 such that ∠APB = 50°, then ∠AOB is equal to: (a) 25° (b) 130° (c) 100° (d) 50°  	1
10	Given that sin α = 1/2 and cos β = 1/2, then the value of (α + β) is: (a) 0° (b) 30° (c) 60 (d) 90°	1
11	$(1+\tan^2 A)/(1+\cot^2 A)$ is equal to: (a) sec² A (b) -1 (c) cot² A (d) tan² A	1
12	The value of sin² 30° – cos² 30° is: (a) –1/2 (b) √3/2 (c) 3/2 (d) –2/3	1
13	Perimeter of a sector of a circle whose central angle is 90° and radius 7 cm is: (a) 35 cm (b) 25 cm (c) 77 cm (d) 7 cm	1
14	The area of a circle that can be inscribed in a square of side 10 cm is: (a) 40π cm² (b) 30π cm² (c) 100π cm² (d) 25π cm²	1
15	A cylinder, a cone and a hemisphere are of equal base and have the same height. What is the ratio of their volumes? (a) 3 : 1 : 2 (b) 3 : 2 : 1 (c) 1 : 2 : 3 (d) 1 : 3 : 2	1
16	If P(E) = 0.07, then what is the probability of 'not E'? (a) 0.89 (b) 0.95 (c) 0.93 (d) 0.90	1

17	For the following distribution | C.I.	0-10	10-20	20-30	30-40	40-50
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f	20	30	24	40	18 | the sum of lower limits of the modal class and the median class is (a) 20 (b) 30 (c) 40 (d) 50	1
18	A card is drawn from a deck of 52 cards. The event E is that card is not an ace of hearts. The number of outcomes favorable to E is: (a) 4 (b) 13 (c) 48 (d) 51	1
	Direction for questions 19 & 20: 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 but 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 HCF of two numbers is 18 and their product is 3072. Then their LCM is 169. **Reason:** If a, b are two positive integers, then HCF x LCM=a x b.	1
20	**Assertion**: For any acute angle θ , the value of Sinθ cannot be greater than 1. **Reason**: Hypotenuse is the longest side in any right triangle.	1
	Section B	
	Section B consists of 5 questions of 2 marks each.	
21	In the figure, if PQ || RS, prove that Δ POQ ~ Δ SOR.  	2
22	Write the first two terms of the given sequence with nth term , $a_n = n^2 - n+1$ **OR** Find the 11^{th} term from the last term of A.P: 10, 7, 4, …-62.	2

23	Calculate the area of a sector of angle 60°. Given, the circle has a radius of 6 cm. **OR** Find the diameter of a circle whose area is equal to the sum of the areas of the two circles of radii 24 cm and 7 cm.	2
24	From a point Q outside a circle , the length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm. Find the radius of the circle.	2
25	Prove the identity: $\frac{\sqrt{(1+sinA)}}{\sqrt{(1-sinA)}}$ = sec A + tan A	2
	Section C	
	Section C consists of 6 questions of 3 marks each.	
26	Compute the zeroes of the polynomial $4x^2 - 4x - 8$. Also, establish a relationship between the zeroes and coefficients.	3
27	Half the perimeter of a rectangular garden, whose length is 4 m more than its width, is 36 m. Find the dimensions of the garden. **OR** Five years ago, Nuri was thrice as old as Sonu. Ten years later, Nuri will be twice as old as Sonu. How old are Nuri and Sonu?	3
28	Prove that $\sqrt{3}$ is irrational number.	3
29	In figure, a quadrilateral ABCD is drawn to circumscribe a circle, with centre O, in such a way that the sides AB, BC, CD and DA touch the circle at the points P, Q, R and S respectively. Prove that: AB + CD = BC + DA.  	3
30	If $\sin\theta - \cos\theta = 0$, find the value of $\sin^4\theta + \cos^4\theta$. **OR** Prove that $(\sin A - 2\sin^3 A)/(2\cos^3 A - \cos A) = \tan A$.	3

31	A die is thrown twice. What is the probability that (i) 5 will not come up either time? (ii) 5 will come up at least once?	3
	Section D	
	Section D consists of 4 questions of 5 marks each	
32	Find a natural number whose square diminished by 84 is equal to thrice of 8 more than the given number.	5
33	In the given figure, EB ⊥ AC, BG ⊥ AE and CF ⊥ AE Prove that: (a) ΔABG ~ ΔDCB (b) $\frac{BC}{BD} = \frac{BE}{BA}$ 	5
34	An ice cream seller sells his ice creams in two ways: (A) In a cone of r = 5 cm, h = 8 cm, having a hemispherical shape on the top. (B) In a cup in shape of cylinder with r = 5 cm, h = 8 cm He charges the same price for both but prefers to sell his ice cream in a cone. (a) Find the volume of the cone and the cup. (b) Which out of the two has more capacity? **OR** A vessel is in the form of a hemispherical bowl surmounted by a hollow cylinder of same diameter. The diameter of the hemispherical bowl is 14 cm and the total height of the vessel is 13 cm. Find the total (inner) surface area of the vessel. (Use π = 22/7)	5
35	Find the mean and median for the following data: *Class* | *Frequency* 0-4 | 3 4-8 | 5 8-12 | 9 12-16 | 5 16-20 | 3 **OR** The mean of the following frequency distribution is 25.2. Find the missing frequency Class | 0 – 10 | 10 – 20 | 20 – 30 | 30 – 40 | 40 – 50 Frequency | 8 | x | 10 | 11 | 9	5

Section E

Case study Based Questions are compulsory

36 **Case Study-1**

A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919. The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kings way), is about 138 feet (42 m) in height.



Based on the above information answer the following questions

(a)	What is the angle of elevation if they are standing at a distance of 42m away from the monument?	1
(b)	They want to see the tower at an angle of 60^o. So, they want to know the distance where they should stand and hence find the distance.	1
(c)	If the altitude of the Sun is at 60^o, What will be the the height of the vertical tower that will cast a shadow of length 20 m . OR The ratio of the length of a India Gate and its shadow is $1:\sqrt{3}$. Then What is the angle of elevation of the Sun .	2

Case Study-2

37 India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.



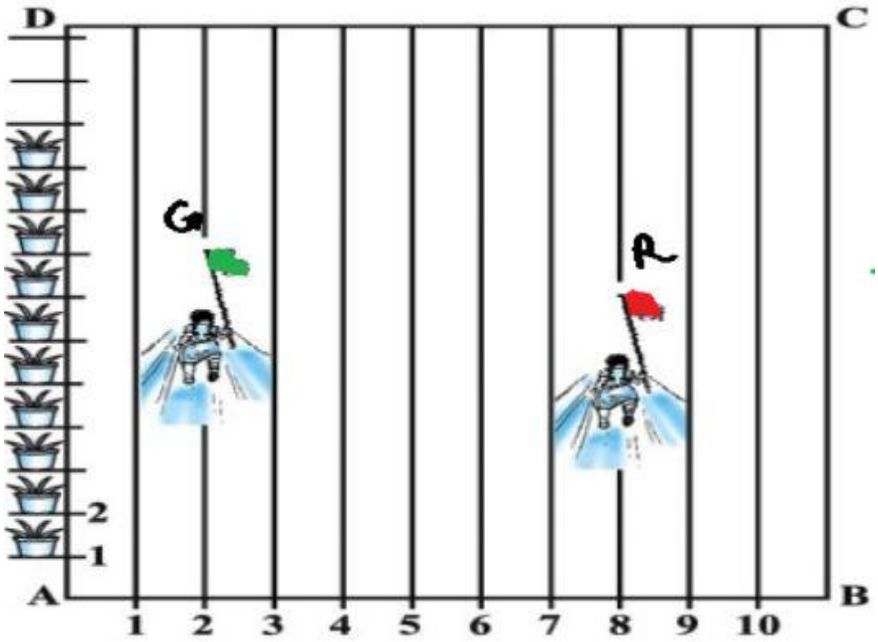
Based on the above information answer the following questions

(a)	Find the production during first year.	1
(b)	Find the production during first 3 years.	1
(c)	In which year, the production is Rs 29,200. OR Find the difference of the production during 7th year and 4th year.	2

38 **Case Study-3**

In order to conduct Sports Day activities in your School, lines have been drawn with chalk powder at a distance of 1 m each, in a rectangular shaped ground ABCD, 100 flower pots have been placed at a distance of 1 m from each other along AD, as shown in given figure below. Niharika runs 1/4 th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5th distance AD on the eighth line and posts a red flag.

Based on the above information answer the following questions



(a)	Find the position of green flag.	1
(b)	Find the position of red flag.	1
(c)	What is the distance between both the flags? OR If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag? **********	2