PRACTICE PAPER 6

CLASS X

TIME: 3 Hours **SUBJECT: MATHEMATICS (BASIC)** **MAX MARKS: 80**

General Instructions:

1 This Question Paper has 5 Sections A-E.

2 Section A has 20 MCQs carrying 1 mark each.

3. Section B has 5 questions carrying 02 marks each.

4. Section C has 6 questions carrying 03 marks each.

5. Section D has 4 questions carrying 05 marks each.

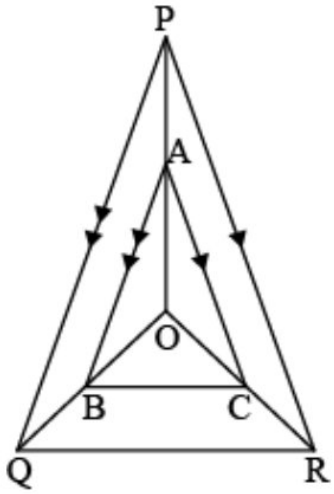
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.

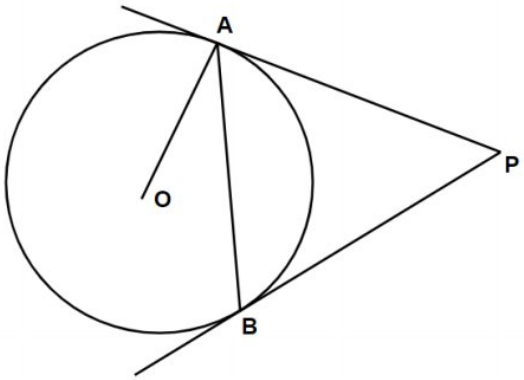
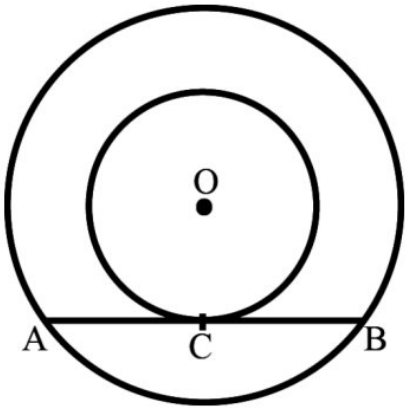
7. All Questions are compulsory. However, an internal choice in 2 Qs of 2 marks, 2 Qs of 3 marks and 2 Questions of 5 marks has been provided. An internal choice has been provided in the 2 marks Questions of Section E.

8. Draw neat figures wherever required. Take π = 22/7 wherever required if not stated.

SECTION A		
	Section A consists of 20 questions of 1 mark each	
Q No.		**MARKS**
1	Let E be an event such that P(not E) = $\frac{1}{5}$, then P(E) = (a) $\frac{1}{5}$ (b) $\frac{2}{5}$ (c) 0 (d) 4	**1**
2	If p (x) = $x^2 + 5x + 6$, then p (− 2) is (a) 20 (b) 0 (c) − 8 (d) 8	**1**
3	The mode of the numbers 2, 3, 3, 4, 5, 4, 4, 5, 3, 4, 2, 6, 7 is (a) 2 (b) 3 (c) 4 (d) 5	**1**
4	How many tangents can be drawn to a circle from a point on it ? (a) 1 (b) 2 (c) Infinite (d) 0	**1**
5	A quadratic equation whose one root is 2 and the sum of whose roots is zero, is (a) $x^2 + 4 = 0$ (b) $x^2 - 2 = 0$ (c) $4x^2 - 1 = 0$ (d) $x^2 - 4 = 0$	**1**
6	Which among the following is not a quadratic equation ? (a) $2(x-1)^2 = 4x^2 - 2x + 1$ (b) $2x - x^2 = x^2 + 5$ (c) $(2x + 3)^2 + x^2 = 3x^2 - 5x$ (d) $(x^2+2x)^2 = x^4 + 3 + 4x^3$	**1**
7	A quadratic polynomial whose sum and product of zeroes are 2 and −1 respectively is (a) $x^2 + 2x + 1$ (b) $x^2 - 2x - 1$ (c) $x^2 + 2x - 1$ (d) $x^2 - 2x + 1$	**1**

8	HCF × LCM for the numbers 30 and 70 is (a) 2100 (b) 21 (c) 210 (d) 70	**1**
9	The length of the arc of a circle of radius 14 cm which subtends an angle of 60o at the centre of the circle is (a) $\frac{44}{3}$cm (b) $\frac{88}{3}$cm (c) $\frac{308}{3}$ cm (d) $\frac{616}{3}$ cm	**1**
10	If the radius of a semi-circular protractor is 7cm, then its perimeter is (a) 11 cm (b) 14 cm (c) 22 cm (d) 36 cm	**1**
11	The angle of elevation of the top of a 15 m high tower at a point $15\sqrt{3}$ m away from the base of the tower is (a) 30° (b) 45° (c) 60° (d) 90°	**1**
12	$\frac{2}{3}\sin 0^0 - \frac{4}{5}\cos 0^0 =$ (a) $\frac{2}{3}$ (b) $\frac{-4}{5}$ (c) 0 (d) $\frac{-2}{15}$	**1**
13	From a well-shuffled deck of 52 cards, a card is drawn at random. What is the probability of getting king of hearts ? (a) $\frac{1}{52}$ (b) $\frac{1}{26}$ (c) $\frac{1}{13}$ (d) $\frac{12}{13}$	**1**
14	The number $(5 - 3\sqrt{5} + \sqrt{5})$ is (a) an integer (b) a rational number (c) an irrational number (d) a whole number	**1**
15	If the pair of linear equations $(3k + 1)x + 3y - 5 = 0$, $2x - 3y + 5 = 0$ has infinitely many solutions, then the value of k is (a) − 1 (b) 0 (c) 1 (d) 2	**1**
16	If $\Delta ABC \sim \Delta DEF$ and $\angle A = 47°$, $\angle E = 83°$, then $\angle C =$ (a) 47° (b) 50° (c) 83° (d) 130°	**1**
17	The length of the tangent from an external point A to a circle, of radius 3 cm, is 4 cm. The distance of A from the centre of the circle is (a) 7 cm (b) 5 cm (c) 7 cm (d) 25 cm	**1**
18	The pair of linear equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ has : (a) a unique solution (b) exactly two solutions (c) infinitely many solutions (d) no solution	**1**
19	**Assertion:** If one root of the quadratic equation $4x^2 - 10x + (k - 4) = 0$ is reciprocal of the other then the value of k is 8. **Reason:** Roots of the quadratic equation $x^2 - x + 1 = 0$ are real. a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).	**1**

	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.	
20	**Assertion:** A tangent to a circle is perpendicular to the radius through the point of contact. **Reason:** The lengths of tangents drawn from an external point to a circle are equal. 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.	**1**
	SECTION B	
	Section B consists of 5 questions of 2 marks each	
21	Find the discriminant of the quadratic equation $3x^2 - 2x + \frac{1}{3} = 0$ and hence find the nature of its roots. **OR** Find the roots of the quadratic equation $x^2 - x - 2 = 0$.	**2**
22	In the figure given below, A, B and C are points on OP, OQ and OR respectively such that AB || PQ and AC || PR. Show that BC || QR.  	**2**
23	If $\sin \alpha = \frac{1}{2}$, then find the value of $(3 \cos \alpha - 4 \cos^3 \alpha)$.	**2**
24	Find the coordinates of the point which divides the join of A (−1, 7) and B (4, −3) in the ratio 2 : 3. **OR** If the points A (2, 3), B (−5, 6), C (6, 7) and D (p, 4) are the vertices of a parallelogram ABCD, find the value of p	**2**

25	PA and PB are tangents drawn to the circle with centre O . Prove that $\angle APB = 2 \angle OAB$  	**2**
	SECTION C	
	Section C consists of 6 questions of 3 marks each	
26	Find the area of the sector of a circle of radius 7 cm and of central angle 90°. Also, find the area of corresponding major sector	**3**
27	If α, β are zeroes of the quadratic polynomial $x^2 - 5x + 6$, form another quadratic polynomial whose zeroes are $\frac{1}{\alpha}$, $\frac{1}{\beta}$	**.3**
28	A die is rolled once. Find the probability of getting: i)an even prime number. ii) a number greater than 4. iii) an odd number.	**3**
29	Prove that $\frac{1+\tan^2 A}{1+\cot^2 A} = \sec^2 A - 1$	**3**
30	Prove that the lengths of tangents drawn from an external point to a circle are equal. **OR** Two concentric circles with centre O are of radii 3 cm and 5 cm. Find the length of chord AB of the larger circle which touches the smaller circle at P.  	**3**
31	If 1 is added to the numerator and 1 is subtracted from the denominator, a fraction	**3**

reduces to 1. It becomes $\frac{1}{2}$ if 1 is added to the denominator. Find the fraction.

OR

For which value of k will the following pair of linear equations have no solution ?

$3x + y = 1$

$(2k - 1)x + (k - 1)y = 2k + 1$

SECTION D

Section D consists of 4 questions of 5 marks each

32 Find the sum of first 51 terms of an A.P. whose second and third terms are 14 and 18, respectively. **5**

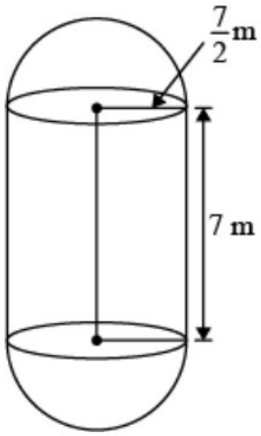
OR

The first term of an A.P. is 5, the last term is 45 and the sum is 400. Find the number of terms and the common difference.

33 The distribution below gives the weight of 30 students of a class. Find the median weight of the students. **5**

Weight in kg	40-45	45-50	50-55	55-60	60-65	65-70	70-75
Number of Students	2	3	8	6	6	3	2

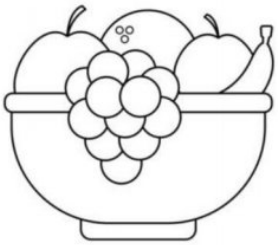
34 The boilers are used in thermal power plants to store water and then used to produce steam. One such boiler consists of a cylindrical part in middle and two hemispherical parts at its both ends. Length of the cylindrical part is 7 m and radius of cylindrical part is $\frac{7}{2}$ m. Find the total surface area and the volume of the boiler. Also, find the ratio of the volume of cylindrical part to the volume of one hemispherical part. **5**



35	The shadow of a tower standing on a level ground is found to be 40 m longer when the Sun's altitude is 30° than when it was 60°. Find the height of the tower. **OR** From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45°. Determine the height of the tower.	**5**
	SECTION E	
	Case study based questions are compulsory	

36 **Case study – 1**

Khushi wants to organize her birthday party. Being health conscious, she decided to serve only fruits in her birthday party. She bought 36 apples and 60 bananas and decided to distribute fruits equally among all.



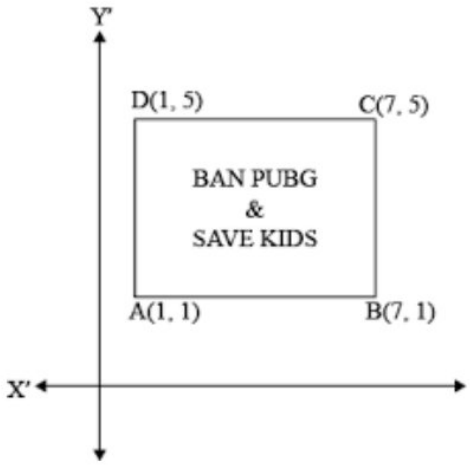
Based on the above information, answer the following questions:

i)	How many guests Khushi can invite at the most ?	**1**
ii)	How many apples and bananas will each guest get ?	**1**
iii)	If Khushi decides to add 42 mangoes, how many guests Khushi can invite at the most? **OR** If the cost of 1 dozen of bananas is ₹ 60, the cost of 1 apple is ₹ 15 and cost of 1 mango is ₹ 20, find the total amount spent on 60 bananas, 36 apples and 42 mangoes.	**2**

37 **Case study – 2**

Use of mobile screen for long hours makes your eye sight weak and give you headaches. Children who are addicted to play "PUBG'' can get easily stressed out. To raise social awareness about ill effects of playing PUBG, a school decided to start 'BAN PUBG' campaign, in which students are asked to prepare campaign board in the shape of a rectangle. One such

campaign board made by class X student of the school is shown in the figure..



Based on the above information, answer the following questions:

i)	Find the coordinates of the point of intersection of diagonals AC and BD.	**1**
ii)	Find the length of the diagonal AC.	**1**
iii)	Find the area of the campaign Board ABCD. **OR** Find the ratio of the length of side AB to the length of the diagonal AC.	**2**

38 **Case study – 3**

Singing bowls (hemispherical in shape) are commonly used in sound healing practices. Mallet (cylindrical in shape) is used to strike the bowl in a sequence to produce sound and vibration. One such bowl is shown here whose dimensions are : Hemispherical bowl has outer radius 6 cm and inner radius 5 cm. Mallet has height of 10 cm and radius 2 cm.

Based on the above information, answer the following questions:

i)	What is the volume of the material used in making the mallet ?	**1**
ii)	The bowl is to be polished from inside. Find the inner surface area of the bowl.	**1**
iii)	Find the volume of metal used to make the bowl. **OR** Find total surface area of the mallet. (Use = 3·14)	**2**