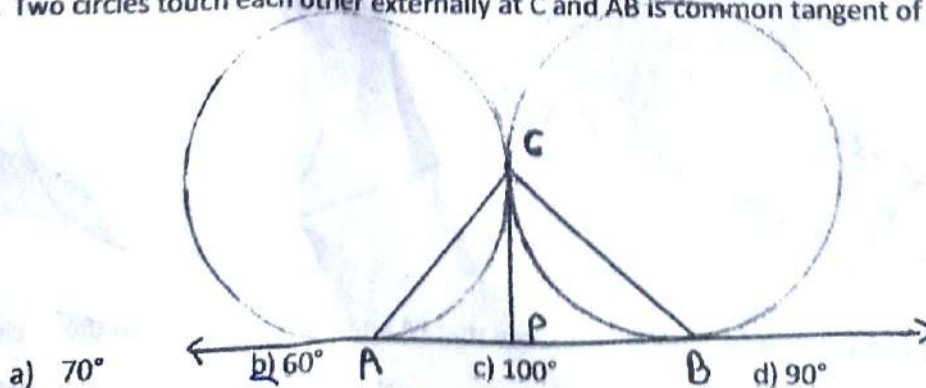


INSTRUCTIONS :

1. This question paper contains 38 questions. All questions are compulsory.
2. In section A, questions no. 1 to 18 are MCQs and question no. 19 and 20 are Assertion-Reason based questions of 1 mark each.
3. In section B, questions no. 21 to 25 are very short answer (VSA) type questions, carrying 2 marks each.
4. In section C, questions no. 26 to 31 are short answer (SA) type questions, carrying 3 marks each.
5. In section D, questions no. 32 to 35 are long answer type questions (LA) carrying 5 marks each.
6. In section E, questions no. 36 to 38 are case based questions carrying 4 marks each.
7. Draw neat diagrams wherever required. Take  $\pi = 22/7$  wherever required, if not stated.
8. Use of calculators is not allowed.

SECTION A

1. The least number that is divisible by all the numbers from 1 to 10 ( both inclusive) is  
 a) 10      b) 100      c) 504      d) 2520
2. If one of the zeroes of a quadratic polynomial of the form  $x^2 + ax + b$  is the negative of the other, then it  
 a) Has no linear term and the constant term is negative.  
 b) Has no linear term and the constant term is positive.  
 c) Can have a linear term but the constant term is negative.  
 d) Can have a linear term but the constant term is positive.
3. Graphically, the pair of equations  $6x - 3y + 10 = 0$ ,  $2x - y + 9 = 0$  represents two lines which are  
 a) Intersecting exactly at one point      b) intersecting at exactly two points  
 b) Coincident      d) parallel
4. Which of the following equation has 2 as a root ?  
 a)  $x^2 - 4x + 5 = 0$       b)  $x^2 + 3x - 12 = 0$       c)  $2x^2 - 7x + 6 = 0$       d)  $3x^2 - 6x - 2 = 0$
5. The next term of A.P.  $\sqrt{7}, \sqrt{28}, \sqrt{63}, \dots$  is  
 a)  $\sqrt{70}$       b)  $\sqrt{120}$       c)  $\sqrt{84}$       d)  $\sqrt{112}$
6. The coordinates of two points are  $(6,0)$  and  $(0,-8)$ . The coordinates of the mid point of the line segment joining them are  
 a)  $(3,4)$       b)  $(3,-4)$       c)  $(0,0)$       d)  $(-4,3)$
7. The distance between the points  $A(\cos P, \sin P)$  and  $B(\sin P, -\cos P)$  is  
 a)  $\sqrt{2}$       b)  $\sqrt{2}\cos P$       c) 1      d)  $\sin P + \cos P$
8. If  $\Delta ABC \sim \Delta PQR$ ,  $AB : PQ = 2 : 3$ ,  $AD \perp BC$ ,  $PS \perp QR$  and  $AD = x$ ,  $PS = x + 5$ , then  $x$  equals to  
 a) 5      b) 7      c) 10      d) 3
9. If two tangents inclined at an angle of  $60^\circ$  are drawn to a circle of radius 3 cm, then the length of each tangent is equal to  
 a)  $3\sqrt{3}/2$  cm      b) 3 cm      c) 6 cm      d)  $3\sqrt{3}$  cm
10. Two circles touch each other externally at C and AB is common tangent of circles, then  $\angle ACB$  is



11. If  $\sin A = 3/4$ , then the value of  $\sec A$  is  
 a)  $3/7$                       b)  $4/7$                       c)  $3/4$                       d)  $4/\sqrt{7}$
12. A ladder 15 m just reaches the top of vertical wall. If the ladder makes an angle of  $60^\circ$  with the wall, then the height of the wall is  
 a) 15m                      b) 30m                      c) 7.5m                      d) 14m
13. The ratio of the length of a rod and its shadow is  $1 : \sqrt{3}$ . The altitude of the Sun is  
 a)  $30^\circ$                       b)  $45^\circ$                       c)  $60^\circ$                       d)  $90^\circ$
14. The area of the circle that can be inscribed in a square of 6cm is  
 a)  $36\pi \text{ cm}^2$                       b)  $18\pi \text{ cm}^2$                       c)  $12\pi \text{ cm}^2$                       d)  $9\pi \text{ cm}^2$
15. Cards each marked with one of the numbers 1,2,3,4,.....18,19,20 are placed and mixed thoroughly. One card is drawn at random from the box. The probability of getting an even number is  
 a) 0                      b)  $1/2$                       c)  $3/4$                       d)  $2/5$
16. The probability that it will rain tomorrow is 0.65. The probability that it will not rain tomorrow is  
 a) 0.45                      b) 0.35                      c) 0.65                      d) 0
17. The lower limit of the modal class of the following data is

|                 |        |         |         |         |          |
|-----------------|--------|---------|---------|---------|----------|
| Marks obtained  | 0 - 20 | 20 - 40 | 40 - 60 | 60 - 80 | 80 - 100 |
| No. of students | 8      | 10      | 13      | 6       | 3        |

- a) 20                      b) 40                      c) 60                      d) 80
18. The diameter of a car wheel is 7 cm. The number of revolutions it will make in moving 11m is  
 a) 500                      b) 50                      c) 2000                      d) 22

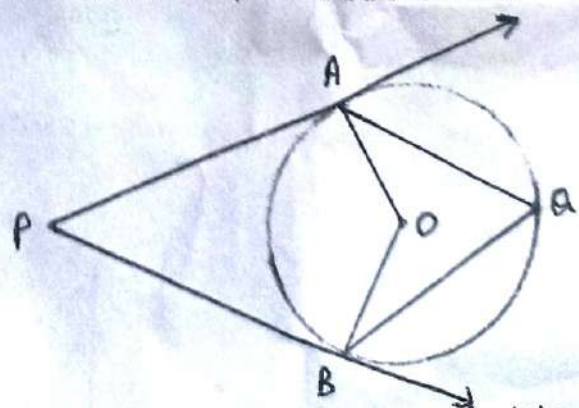
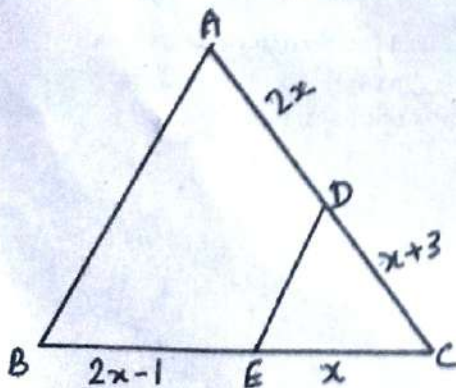
Question number 19 and 20 are Assertion and Reason based questions carrying 1 mark each. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from codes (a), (b), (c) and (d) as given below.

- a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
- b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).
- c) Assertion (A) is true, but Reason (R) is false.
- d) Assertion (A) is false, but Reason (R) is true.
19. Statement A (Assertion) : Total surface area of the pencil sharpened at one edge is the sum of curved surface area of the cone and the curved surface area of cylinder.  
 Statement R ( Reason) : Sharpened pencil at one edge is the combination of right circular cylinder and right circular cone.
20. Statement A (Assertion) : the tenth term of the A.P. 4, -1, -6, -11, ..... is -41.  
 Statement R ( Reason) : If  $S_n$  is the sum of first n terms of an A.P., then its nth term is given by  

$$a = S_n - S_{n-1}$$

#### SECTION B

21. Given  $\sqrt{2}$  is irrational, prove that  $5 + \sqrt{2}$  is irrational.
22. In the given  $\triangle ABC$ ,  $DE \parallel AB$ . If  $AD = 2x$ ,  $DC = x + 3$ ,  $BE = 2x - 1$  and  $CE = x$ , then find the value of x.



23. In the given figure, O is the centre of circle. Find  $\angle AQB$ , given that PA and PB are tangents to the circle and  $\angle APB = 75^\circ$ .

24. If  $\sin(A+B) = 1$  and  $\cos(A-B) = \sqrt{3}/2$ ,  $0^\circ < A+B \leq 90^\circ$  and  $A > B$ , then find the measures of angles A and B.

25. An umbrella has 8 ribs which are equally spaced as shown in figure. Assuming umbrella to be flat circle of radius 45 cm, find the area between the two consecutive ribs of the umbrella.

#### SECTION C

26. Explain why  $7 \times 11 \times 13 + 13$  and  $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$  are composite numbers.

27. If  $\alpha$  and  $\beta$  are the zeroes of the quadratic polynomial  $f(x) = 2x^2 - 5x + 7$ , find the quadratic polynomial whose zeroes are  $2\alpha + 3\beta$  and  $3\alpha + 2\beta$ .

28. Two straight paths are represented by the equations  $x - 3y = 2$  and  $-2x + 6y = 5$ . Check whether the paths cross each other or not. Or Solve  $152x - 378y = -74$ ;  $-378x + 152y = -604$ .

29. Prove that the lengths of the tangents drawn from an external point to a circle are equal.

30. Prove that  $\tan A / (1 - \cot A) + \cot A / (1 - \tan A) = 1 + \sec A \cdot \operatorname{cosec} A$

31. The weekly pocket money of the students of class X of a school is given in the following table :

| Pocket money (in rupees) | 0 - 40 | 40 - 80 | 80 - 120 | 120 - 160 | 160 - 200 | 200 - 240 |
|--------------------------|--------|---------|----------|-----------|-----------|-----------|
| No. of students          | 5      | 7       | 15       | 10        | 5         | 8         |

Find the median for the above data.

#### SECTION D

32. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 h less for the same journey. Find the speed of the train.

33. In two triangles ABC and DEF, if AB, AC and median AX are respectively proportional to DE, DF and median DY, then prove that  $\triangle ABC \sim \triangle DEF$ .

34. Krish decided to order the birthday cake for party. For this he decided cylindrical cake with base circumference  $75\frac{3}{4}$  cm and height 14 cm. The bakery shop sells cakes by weight (0.5 kg, 1 kg, 1.5 kg etc) To have the required dimensions, how much cake should he order if  $650 \text{ cm}^3$  equals 100g of cake?

35. The following frequency distribution shows the daily savings of 64 children in a locality :

| Daily savings (in rupees) | 1 - 3 | 3 - 5 | 5 - 7 | 7 - 9 | 9 - 11 | 11 - 13 | 13 - 15 |
|---------------------------|-------|-------|-------|-------|--------|---------|---------|
| Number of children        | 7     | 6     | x     | 13    | y      | 5       | 4       |

If mean savings is ₹ 8, then find the missing frequencies x and y.

#### SECTION E

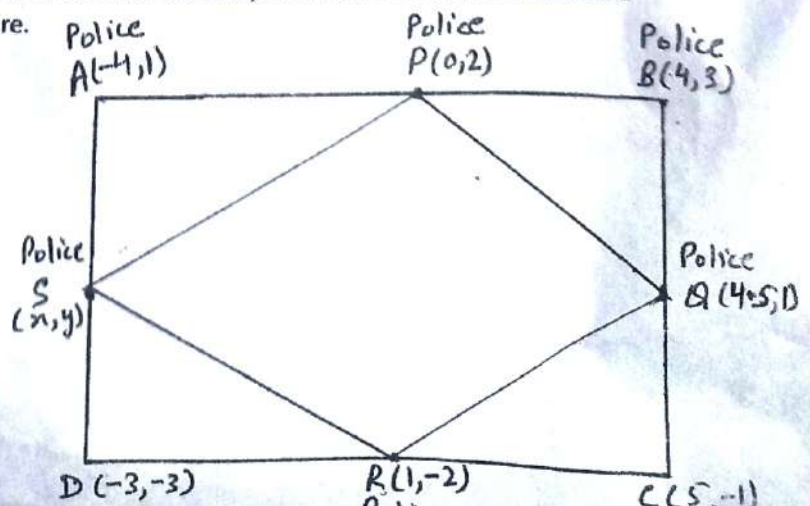
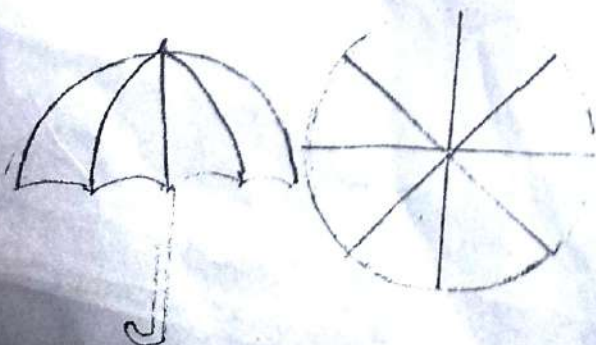
36. Rohit gets pocket money from his father everyday. Out of the pocket money he saves ₹ 1.25 on first day, ₹ 1.50 on second day, ₹ 1.75 on third day and so on.

On the basis of above information, answer the following questions :

- What is the amount saved by Rohit on 15<sup>th</sup> day?
- What is the total amount saved by Rohit in the month of January?
- On which day, he saves ten times as much as he saved on day 1?

OR In how many days he will be able to collect ₹ 342?

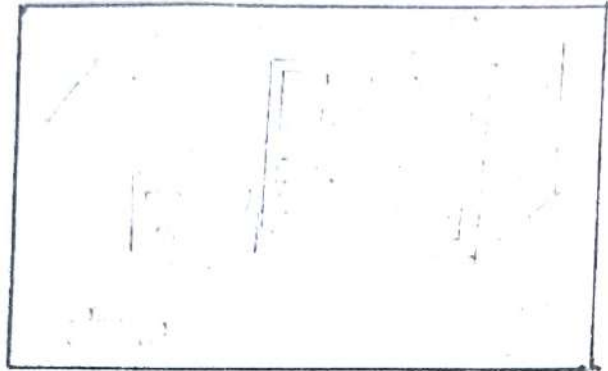
37. In order to facilitate smooth passage of parade, movement of traffic on certain roads leading to the route of the Parade and Tableaux always restricted. To avoid on the road, Delhi Police decided to construct a rectangular route plan as shown in the figure.



Based on the above information, answer the following questions :

- (i) If S is the mid point of AD, what are the coordinates of S ?
- (ii) What are the coordinates of the intersection point of the diagonals of rectangle ABCD ?
- (iii) What is the length of route ABCD ? OR Name the type of quadrilateral PQRS formed . Explain your answer.

38. Neha is standing at the top of the building observes a car at an angle of  $30^\circ$ , which is approaching towards the building with a uniform speed. 6 seconds later, angle of depression of car formed to be  $60^\circ$ , whose distance from the building is 26m.



Based on above information, answer the following questions :

- (i) Draw a well labelled diagram.
- (ii) What is the height of the building ?
- (iii) What is the distance between two positions of the car ? Also find the time taken by the car to reach the foot of the building from the starting point ? OR  
Find the distance of the observer from the car when it makes an angle of  $30^\circ$  and  $60^\circ$ .

*Sachin*  
16/1/24