

## SAMPLE PAPER - 05

TIME : 3 HRS.

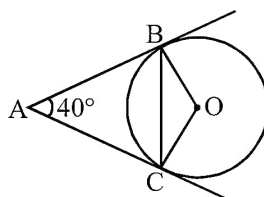
MAX. MARKS : 80

**GENERAL INSTRUCTIONS :**

- ▶ All questions are compulsory.
- ▶ The question paper consists of 38 questions divided into five sections A, B, C, D and E.
- ▶ Section A contains multiple choice questions (Q.1 to Q.20) of one mark, only the correct option is to be written in your answer sheet.  
Section B contains short answer type questions (Q.21 to Q.25) carrying two marks each.  
Section C contains short answer type questions (Q.26 to Q.31) carrying three marks each.  
Section D contains short answer type questions (Q.32 to Q.35) carrying five 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.
- ▶ 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 2marks sub part of questions of Section E
- ▶ There is no overall choice. However, internal choice may be provided . You have to attempt only one of the alternatives in all such questions.
- ▶ Use of calculators and cell-phones are not permitted in the Examination Hall.

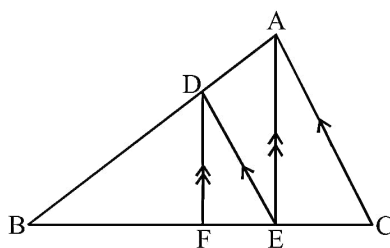
**SECTION-A**

1. The number of polynomials having zeroes as  $-2$  and  $5$  is  
(1) 1 (2) 2 (3) 3 (4) more than 3
2. Given that  $\sin\theta = \frac{a}{b}$ , then  $\cos\theta$  is equal to  
(1)  $\frac{b}{\sqrt{b^2 - a^2}}$  (2)  $\frac{b}{a}$  (3)  $\frac{\sqrt{b^2 - a^2}}{b}$  (4)  $\frac{a}{\sqrt{b^2 - a^2}}$
3. In an AP, if  $a = 3.5$ ,  $d = 0$ ,  $n = 101$  then  $a_n$  is  
(1) 01 (2) 3.5 (3) 103.5 (4) 104.5
4. Ratio of sides a right triangle with respect to its acute angles are known as  
(1) Trigonometric identities (2) Trigonometry  
(3) Trigonometric ratios of the angles (4) None of these
5. In figure AB and AC are tangent with centre O and  $\angle BAC = 40^\circ$ , then  $\angle BOC$  is equal to



- (1)  $40^\circ$  (2)  $50^\circ$  (3)  $140^\circ$  (4)  $150^\circ$
6. The radii of two circles are 3 cm and 4 cm respectively. The diameter of the circle having area equal to sum of the areas of two circles (in cm) is  
(1) 5 (2) 7 (3) 10 (4) 14

7. The radius (in cm) of the largest right circular cone that can be cut out from a cube of edge 4.2 cm is  
 (1) 4.2 (2) 2.1 (3) 8.1 (4) 1.05
8. If  $\sin\theta = \cos\theta$ , then the value of  $2\tan\theta + \cos^2\theta$  is  
 (1) 2 (2)  $\frac{5}{2}$  (3) 4 (4) None of these
9. Two cubes each with 6 cm edge are joined end to end. The surface area of resulting cuboid is  
 (1)  $360 \text{ cm}^2$  (2)  $720 \text{ cm}^2$  (3)  $540 \text{ cm}^2$  (4)  $180 \text{ cm}^2$
10. Construction of cumulative frequency table is useful in determining the  
 (1) Mean (2) Mode (3) Range (4) Median
11. If the product of zeroes of  $x^2 - 3kx + 2k^2 - 1$  is 7 then values of k are  
 (1)  $\pm 4$  (2)  $\pm 2\sqrt{2}$  (3)  $\pm 2$  (4)  $\pm 6$
12. If  $(p - 1)$  ;  $(p + 3)$  ;  $(3p - 1)$  are in AP, then p is equal to  
 (1) 1 (2) 2 (3) 3 (4) 4
13. Find the values of k for which the quadratic equation  $9x^2 - 3kx + k = 0$  has equal roots.  
 (1) 0 or 4 (2) 0 or 2 (3) 2 or 4 (4) 3 or 6
14. The number of revolutions made by a circular wheel of radius 0.25 m in rolling a distance of 11 km is  
 (1) 2800 (2) 4000 (3) 5500 (4) 7000
15. AOBC is a rectangle whose three vertices are A(0, 3), O(0, 0) and B(5, 0). Find the length of its diagonal.  
 (1)  $\sqrt{17}$  (2)  $\sqrt{34}$  (3)  $2\sqrt{17}$  (4)  $2\sqrt{34}$
16. If  $\sin^2 A = 2 \sin A$  then find the value of A.  
 (1)  $45^\circ$  (2)  $30^\circ$  (3)  $60^\circ$  (4)  $0^\circ$
17. In an AP, if the common difference (d) = -4, and the seventh term ( $a_7$ ) is 4, then find the first term.  
 (1) 30 (2) 28 (3) 26 (4) 40
18. In the figure below,  $DE \parallel AC$  and  $DF \parallel AE$ . Which of these is equal to  $\frac{BF}{FE}$ ?



- (1)  $\frac{DF}{AE}$  (2)  $\frac{BE}{EC}$  (3)  $\frac{BA}{AC}$  (4)  $\frac{FE}{EC}$
19. **Assertion (A)** : If a chord AB subtends an angle of  $60^\circ$  at the centre of a circle, then the angle between the tangents at A and B is also  $60^\circ$ .  
**Reason (R)** : The length of the tangent from an external point P on a circle with centre O is always less than OP.
- (1) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).  
 (2) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).  
 (3) Assertion (A) is true but Reason (R) is false.  
 (4) Assertion (A) is false but Reason (R) is true.

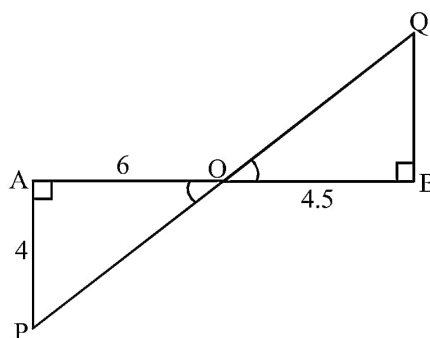
20. **Assertion (A)** : The length of the tangent drawn from a point 8 cm away from the centre of circle of radius 6 cm is  $2\sqrt{7}$  cm .

**Reason (R)** : If the angle between two radii of a circle is  $130^\circ$ , then the angle between the tangents at the end points of radii at their point of intersection is  $50^\circ$ .

- (1) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).  
 (2) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).  
 (3) Assertion (A) is true but Reason (R) is false.  
 (4) Assertion (A) is false but Reason (R) is true.

**SECTION-B**

21. In the given figure, if  $\angle A = 90^\circ$ ,  $\angle B = 90^\circ$ ,  $OB = 4.5$  cm,  $OA = 6$  cm and  $AP = 4$  cm, then find  $QB$ .



22. Five cards-the ten, jack, queen, king and ace of diamonds are well-shuffled with their face downwards. One card is then picked up at random.  
 (i) What is the probability that the card is the queen?  
 (ii) If the queen is drawn and put aside, what is the probability that the second card picked up is an ace?
23. The HCF and LCM of two numbers are 9 and 360 respectively. If one number is 45, find the other number.

**OR**

Show that  $7 - \sqrt{5}$  is irrational, given that  $\sqrt{5}$  is irrational.

24. Find the 20<sup>th</sup> term from the last term of the AP 3,8,13,.....,253

**OR**

If 7 times the 7<sup>th</sup> term of an A.P is equal to 11 times its 11<sup>th</sup> term, then find its 18<sup>th</sup> term.

25. Find the coordinates of the point P which divides the join of  $A(-2, 5)$  and  $B(3, -5)$  in the ratio 2 : 3.

**SECTION-C**

26. A fraction becomes  $\frac{1}{3}$  when 1 is subtracted from the numerator and it becomes  $\frac{1}{4}$  when 8 is added to its denominator. Find the fraction.

**OR**

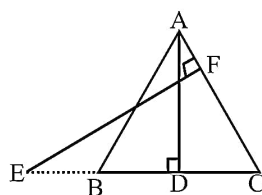
Places A and B are 80 km apart from each other on a highway. A car starts from A and another from B at the same time. If they move in same direction they meet in 8 hours and if they move towards each other they meet in 1 hour 20 minutes. Find the speed of cars.

27. Prove that  $\sin\theta(1 + \tan\theta) + \cos\theta(1 + \cot\theta) = \sec\theta + \operatorname{cosec}\theta$

28. A girl empties a cylindrical bucket full of sand, of base radius 18 cm and height 32 cm, on the floor to form a conical heap of sand. If the height of this conical heap is 24 cm, then find its slant height correct up to one place of decimal.
29. The points  $A(1, -2)$ ,  $B(2, 3)$ ,  $C(k, 2)$  and  $D(-4, -3)$  are the vertices of a parallelogram. Find the value of  $k$ .
30. The table shows the daily expenditure on grocery of 25 households in a locality. Find the modal daily expenditure on grocery by a suitable method.

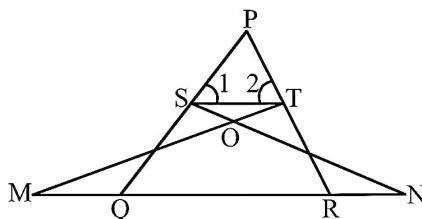
Daily Expenditure (in ₹ )	100 – 150	150 – 200	200 – 250	250 – 300	300 – 350
No of households	4	5	12	2	2

31. In the given figure,  $AB = AC$ .  $E$  is a point on  $CB$  produced. If  $AD$  is perpendicular to  $BC$  and  $EF$  perpendicular to  $AC$ , prove that  $\triangle ABD$  is similar to  $\triangle ECF$ .



**OR**

In figure  $\angle 1 = \angle 2$  and  $\triangle NSQ \cong \triangle MTR$ , then prove that  $\triangle PTS \sim \triangle PRQ$ .



**SECTION-D**

32. If  $S_n$  denotes the sum of the first  $n$  terms of an AP, prove that  $S_{30} = 3(S_{20} - S_{10})$ .

**OR**

The sum of the first 7 terms of an AP is 63 and the sum of its next 7 terms is 161. Find the 28th term of this AP.

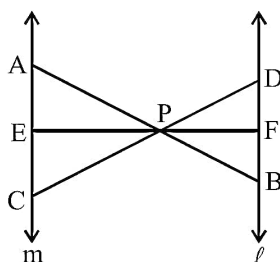
33. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of  $30^\circ$ , which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be  $60^\circ$ . Find the time taken by the car to reach the foot of the tower from the point.

**OR**

A man on the top of a vertical observation tower observes a car moving at a uniform speed coming directly towards it. If it takes 12 minutes for the angle of depression to change from  $30^\circ$  to  $45^\circ$ , how long will the car take to reach the observation tower from this point?

34. In the figure given below,  $l \parallel m$  and line segments AB, CD and EF concurrent at point P. Prove that

$$\frac{AE}{BF} = \frac{AC}{BD} = \frac{CE}{FD}.$$



35. The median of the following data is 525. Find the values of x and y if the total frequency is 100.

Class Interval	Frequency
0 – 100	2
100 – 200	5
200 – 300	x
300 – 400	12
400 – 500	17
500 – 600	20
600 – 700	y
700 – 800	9
800 – 900	7
900 – 1000	4

**SECTION-E**

36. **Case Study-1**

A book store shopkeeper gives books on rent for reading. He has variety of books in his store related to fiction, stories and quizzes, etc. He takes a fixed charge for the first two days and an additional charge for subsequent day. Amruta paid Rs.22 for a book kept for 6 days ; while Radhika paid Rs.16 for keeping the book for 4 days.



Assume that the fixed charge be Rs.x and additional charge (per day) be Rs.y.

Based on the above information, answer the following questions :

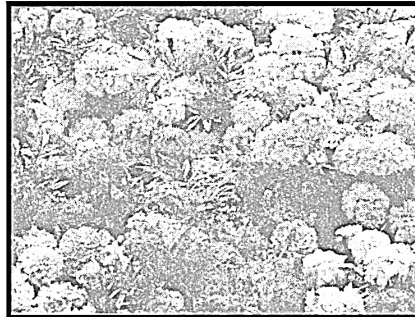
- (i) Frame the algebraic equation for Radhika.
- (ii) Fram the algebraic equation for Amruta.
- (iii) What are the additional charges for each subsequent day for a book?

**OR**

Which is the total amount paid by both, if both of them have kept the book for 2 more days?

**37. Case Study-2**

A garden consists of 135 rose plants planted in certain number of columns. There is another set of 225 marigold plants, which is to be planted in the same number of columns.



Read carefully the above paragraph and answer the following questions :

- (i) What is the maximum number of columns in which they can be planted?

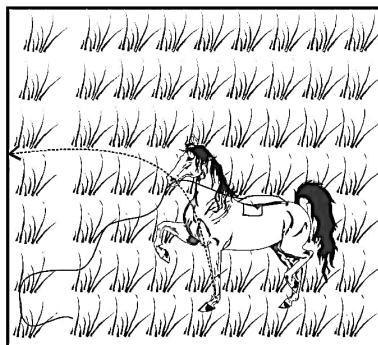
**OR**

Find the total number of plants.

- (ii) Find the sum of exponents of the prime factors of the maximum number of columns in which they can be planted.
- (iii) What is total numbers of row in which they can be planted

**38. Case Study-3**

A horse is tied to a peg at one corner of a square shaped grass field of sides 15 m by means of a 5 m long rope (see the given figure).



- (i) What is the area of the grass field?
- (ii) What would be the area of the field in which the horse can graze.
- (iii) What would be the grazing area if the rope was 10 m instead of 5 m.

**OR**

Calculate the increase area in grazing if the rope was 10 m long instead of 5 m.