

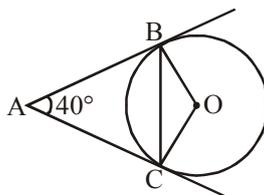
SAMPLE PAPER - 1
TIME : 3 HRS.
MAX. MARKS : 80
GENERAL INSTRUCTIONS :

- This Question Paper has 5 Sections A, B, C, D and E.
- Section A has 20 MCQs carrying 1 mark each.
- Section B has 5 questions carrying 2 marks each.
- Section C has 6 questions carrying 3 marks each.
- Section D has 4 questions carrying 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.
- All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
- Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

SECTION-A

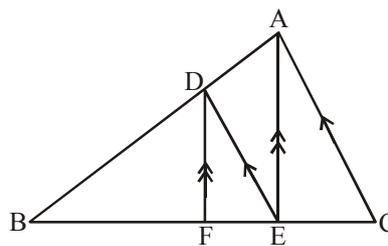
Section A consists of 20 questions of 1 mark each.

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



- (a) 40° (b) 50° (c) 140° (d) 150°
- 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:
 (a) 5 (b) 7 (c) 10 (d) 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:
 (a) 4.2 (b) 2.1 (c) 8.1 (d) 1.05
8. If $\sin\theta = \cos\theta$, then the value of $2\tan\theta + \cos^2\theta$ is:
 (a) 2 (b) $\frac{5}{2}$ (c) 4 (d) None of these
9. Two cubes each with 6 cm edge are joined end to end. The surface area of resulting cuboid is:
 (a) 360 cm^2 (b) 720 cm^2 (c) 540 cm^2 (d) 180 cm^2
10. Construction of cumulative frequency table is useful in determining the:
 (a) Mean (b) Mode (c) Range (d) Median
11. If the product of zeroes of $x^2 - 3kx + 2k^2 - 1$ is 7 then values of k are:
 (a) ± 4 (b) $\pm 2\sqrt{2}$ (c) ± 2 (d) ± 6
12. If $(p - 1)$; $(p + 3)$; $(3p - 1)$ are in AP, then p is equal to:
 (a) 1 (b) 2 (c) 3 (d) 4
13. Find the values of k for which the quadratic equation $9x^2 - 3kx + k = 0$ has equal roots.
 (a) 0 or 4 (b) 0 or 2 (c) 2 or 4 (d) 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:
 (a) 2800 (b) 4000 (c) 5500 (d) 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.
 (a) $\sqrt{17}$ (b) $\sqrt{34}$ (c) $2\sqrt{17}$ (d) $2\sqrt{34}$
16. If $\sin^2 A = 2 \sin A$ then find the value of A.
 (a) 45° (b) 30° (c) 60° (d) 0°
17. In an AP, if the common difference $(d) = -4$, and the seventh term (a_7) is 4, then find the first term.
 (a) 30 (b) 28 (c) 26 (d) 40
18. In the figure below, $DE \parallel AC$ and $DF \parallel AE$. Which of these is equal to $\frac{BF}{FE}$?



- (a) $\frac{DF}{AE}$ (b) $\frac{BE}{EC}$ (c) $\frac{BA}{AC}$ (d) $\frac{FE}{EC}$
19. **Assertion (A)** : If a chord AB subtends an angle of 60° at the centre of a circle, then the angle between the tangents at A and B is also 60° .
Reason (R) : The length of the tangent from an external point P on a circle with centre O is always less than OP.
 (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.

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 .

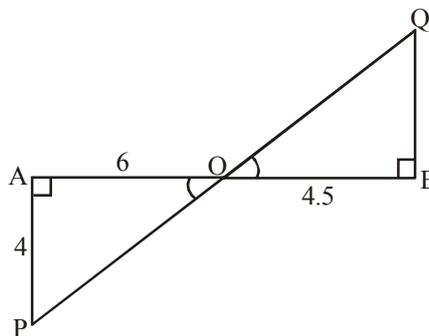
Reason (R) : If the angle between two radii of a circle is 130° , then the angle between the tangents at the end points of radii at their point of intersection is 50° .

- (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.

SECTION-B

Section B consists of 5 questions of 2 marks each.

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 20th term from the last term of the AP 3,8,13,.....,253.

OR

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

Section C consists of 6 questions of 3 marks each.

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

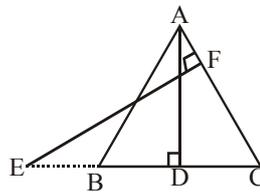
Places A and B are 80 km apart from each other on a highway. A car starts from A and another from B at the same time. If they move in same direction they meet in 8 hours and if they move towards each other they meet in 1 hour 20 minutes. Find the speed of cars.

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.

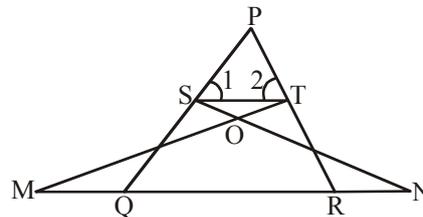
Daily Expenditure (in ₹)	100 – 150	150 – 200	200 – 250	250 – 300	300 – 350
No of households	4	5	12	2	2

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

Section D consists of 4 questions of 5 marks each.

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.

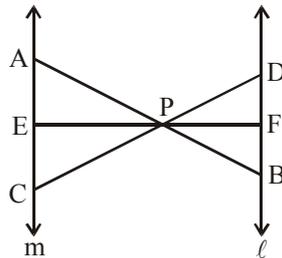
33. A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30° , which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60° . Find the time taken 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° to 45° , how long will the car take to reach the observation tower from this point?

34. In the figure given below, $\ell \parallel m$ 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

Section E consists of 3 questions of 4 marks each.

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) Frame 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) Find the sum of exponents of the prime factors of 135.
- (ii) What is the maximum number of columns in which they can be planted?

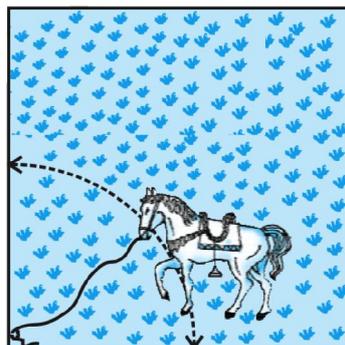
OR

If the HCF of 135 and 225 is written in the form of $8m - 3$. Find the value of m .

- (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.