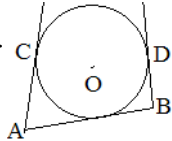
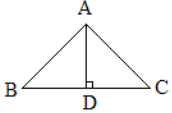


10th STANDARD MID-TERM EXAMINATION
MATHEMATICS

A

Duration : 2hour 45minutes

Maximum Marks : 80

1. If $A=\{2,3,4,5\}$ and $B=\{4,5\}$, which of the following is a null set ? 1×8=8
 A) $A \setminus B$ B) $B \setminus A$ C) $A \cup B$ D) $A \cap B$
2. No term of a Harmonic sequence can be
 A) 1 B) 2 C) 3 D) 0
3. Which of the following is a surd ?
 A) $\sqrt{1}$ B) $\sqrt{-5}$ C) $\sqrt{5}$ D) $\sqrt{25}$
4. If we divide the polynomial $p(x)$ by $(x-a)$ then the remainder will be
 A) $p(x-a)$ B) $p(x)$ C) $p(a)$ D) $p(-a)$
5. In the figure AB, AC and BD are tangents. If $AB = x$ and $BD = y$, $AC = \dots$
 A) $(x - y)$ B) $(x + y)$ C) x D) y 
6. Two circles having same centres are called circles.
 A) incentric B) concentric C) congruent D) centric
7. In $\triangle ABC$, $\angle BAC = 90^\circ$ and if $AD \perp BC$ then $AD^2 = \dots$
 A) $AB \cdot BD$ B) $AC \cdot DC$ C) $AB \cdot AC$ D) $BD \cdot DC$ 
8. Which of the following is a Pythagorean triplet ?
 A) 12 , 8 , 13 B) 8 , 7 , 12 C) 8 , 15 , 17 D) 5 , 4 , 9
9. If $M=\{1, 2, 3, 4\}$ and $N=\{1, 3, 7\}$ find the set $(M \setminus N)$. 1×6=6
10. If 5 , 3 , 1 , -1 are in A.P. write the corresponding Harmonic Progression.
11. Simplify : $\sqrt{125}$
12. How many zeroes are there to the polynomial $p(x) = x - 5$?
13. What is the measure of an angle inscribed in a semicircle ?
14. State Pythagoras Theorem.
15. In a group of 100 persons, 72 people can speak English and 43 can speak French.
 How many can speak both English and French? 2×16=32
16. $A=\{2,3,4\}$ and $B=\{4,5,6\}$. Draw Venn diagrams to show $(A \cup B)$ and $(A \cap B)$.
17. In a geometric progression 6th term is 32 and common ratio is 2. Find the first term.
18. Find the sum of all the natural numbers from 1 to 1000.

OR

Find the sum of the first 10 terms of geometric series : $1 + 2 + 4 + \dots$

19. Find the Arithmetic mean and Geometric mean between 1 and 9.
20. What are like surds ? Give an example.
21. Find the product of $\sqrt[3]{3}$ and $\sqrt{3}$.
22. Rationalise the denominator and simplify : $\frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$
23. Three circles of radius 3cm, 4cm and 5cm touch each other externally. Find the perimeter of the triangle formed by joining the centres of the circles.

24. Divide $(x^3 - 3x^2 + 10x - 5)$ by $(x - 2)$ using synthetic division method.

OR

Divide $(m^3 - 2m^2 + 5m - 3)$ by $(m - 3)$ using long division method.

25. In a circle of radius 4 cm, draw two radii such that the angle between them is 120° . Draw two tangents at the ends of the radii.

26. $AB = 5\text{cm}$. Draw a circle of diameter AB and construct tangents at A and B .

27. Draw a circle of radius 4 cm and construct a chord of 6cm length on it.

28. In $\triangle ABC$, P and Q are the points on AB and AC such that $\angle APQ = \angle ACB$. Prove that $AP \cdot AB = AQ \cdot AC$.

29. $XY \parallel BC$ in $\triangle ABC$. If $AX = 10\text{cm}$, $XB = 4\text{cm}$ and $AC = 21\text{cm}$, find AY and CY .

30. An aeroplane flies due north for 19km then changes direction and flies east for 180km. How far is it now in a straight line from its starting position.

31. If $U = \{0, 1, 2, 3, 4, 5, 6\}$, $P = \{1, 3, 5\}$ and $Q = \{4, 5, 6\}$ show that $(P \cup Q)^c = P^c \cap Q^c$.

32. In a G.P., $S_6 : S_3 = 35 : 8$ and the first term is 2. Find the 2nd term.

OR

Find the sum of series : $5 + 10 + 15 + \dots + 200$.

33. State and prove Basic Proportionality Theorem.

OR

Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides.

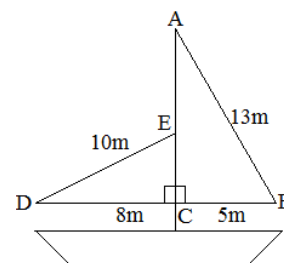
34. Prove that "If two circles touch each other externally, the centres and the point of contact are collinear".

35. What must be subtracted from $(x^3 + 5x^2 + 10x + 1)$ so that it is exactly divisible by $(x + 2)$?

OR

Find the zero of the polynomial $x^2 + 5x - 14$ and verify.

36. In the figure $AC \perp DB$, $AB = 13\text{m}$,
 $BC = 5\text{m}$, $DC = 8\text{m}$ and $DE = 10\text{m}$.
Calculate the length of AE .



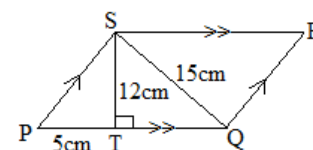
OR

In the figure PQRS is a parallelogram.

$ST \perp PQ$, $ST = 12\text{cm}$, $PT = 5\text{cm}$,

$SQ = 15\text{cm}$ and $DE = 10\text{m}$.

Calculate the perimeter of the parallelogram.



37. Find the common ratio of the G.P. in which sum of the third and fifth terms is 90 and its first term is 1.

$$4 \times 4 = 16$$

OR

Find the sum of first 10 terms of an A.P. in which $T_3 = 12$ and $T_{50} = 106$.

38. By using remainder theorem find the remainder when $p(x) = (x^3 - 5x^2 - 9x + 10)$ is divided by $g(x) = (x - 1)$ and verify the answer by actual division.

39. Construct two circles of radii 3 cm and 2.5 cm whose centres are 9 cm apart. Construct a transverse common tangent. Measure and write its length.

40. Prove that "If two triangles are equiangular, then their corresponding sides are in proportion".

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