MAX MARKS:80

STD: X

DURATION: 3 Hrs

DATE:23/09/2019

General Instructions:

i) **All** questions are compulsory.

ii) The question paper consists of 40 questions divided into four sections- A,B,C and D

iii) **Section – A** Questions **1 – 20** carry 1 mark each.

iv) **Section – B** Questions **21 – 26** carry 2 marks each.

v) **Section – C** Questions **27 – 34** carry 3 marks each.

vi) **Section – D** Questions **35 – 40** carry 4 marks each.

vii) There is no overall choice. However ,an internal choice has been provided in **two** questions of two marks each, **two** questions of three marks each , **three** questions of four marks each. You have to attempt only **one** of the alternatives in all such questions.

viii) Use of calculators is **not** permitted

SECTION-A

1. The decimal expansion of 14753/1250 will terminate after how many decimal places?

   a) 1 b) 2 c) 3 d) 4

2. For positive integers "a" and 4 , there exist unique integers q and r such that a=4q +r where r must satisfy:

   a) $0 \leqslant r < 4$ b) $1 \leqslant r < 4$ c) $0 < r < 4$ d) $0 \leqslant r \leqslant 4$

3. A cubic polynomial can have _____ zeroes.

   a) exactly 3 zeroes b) at least 3 zeroes c) at most 3 zeroes d) no zeroes

4. A quadratic polynomial whose zeroes are -5 and 3 is _____

   a) $x^2 - 2x - 15$ b) $x^2 - 2x + 15$ c) $x^2 + 2x + 15$ d) $x^2 + 2x - 15$

5. If a pair of linear equations is inconsistent then their graph lines will be _____

a) parallel   b) intersecting lines

c) coincident   d) intersecting or coincident

6. A line that intersects a circle at two distinct points is _____

a) tangent   b) secant   c) chord   d) diameter

7. Which of the following pairs of lines in a circle cannot be parallel?

a) two chords   b) a chord and a tangent   c) two tangents   d) two diameters

8. Corresponding sides of two similar triangles are in the ratio 4:9, Areas of these triangles are in the ratio

a) 2:3   b) 4:9   c) 9:4   d) 16:81

9. A man goes 10m due east and then 20m due north .His distance from the starting point is _____

a) $10\sqrt{5}$ b) 10   c) $5\sqrt{10}$ d) 5

10. L.C.M of $5^2 \times 3^3$ and $3^2 \times 5^3$ is _____

a) $5^2 \times 3^2$ b) $5^3 \times 3^3$ c) $5^2 \times 3^3$ d) $5^3 \times 3^2$

11. If $\sqrt{3}$ tan2θ -3 = 0 then θ = _____

a) 15⁰   b)30⁰   c)45⁰   d) 60⁰

12. $3\cos^2 60^0 + 2\cot^2 30^0 - 5\sin^2 45^0 = $ _____

a) 13/6   b)17/4   c)1   d)4

13. If the product of the roots of the equation $x^2 -3x + k =10$ is -2 then the va of k is _____

a) -2   b) -8   c) 8   d) 12

14. In a lottery there are 8 prizes and 16 blanks. What is the probability of getting a prize?

a) 1/2   b) 1/3   c) 2/3   d) 3/2

15. If P(a/2,4) is the midpoint of the line segment joining the points A(-6,5) and B(-2,3) then the value of ' a' is _____
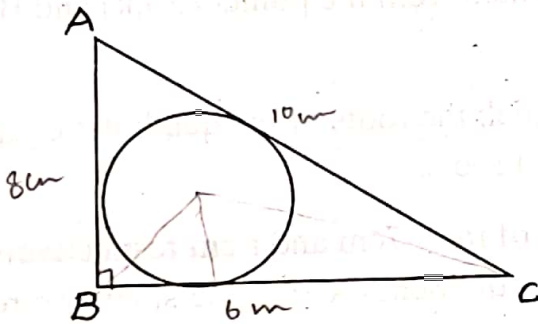
a) -8   b)3   c)-4   d) 4

16. A pole 6m high casts a shadow $2\sqrt{3}$m long on the ground then the sun's elevation is _____

a) 60^0 b) 45^0 c)30^0 d)90^0

17. The perimeter of a triangle with vertices (0,4),(0,0),(3,0) is

a) 5   b) 12   c) 7   d) $7 + \sqrt{3}$

18. In the figure ABC is a right triangle with $\angle ABC = 90^\circ$ .If BC =6cm and AB=8cm then the radius of its incircle is _____

a) 1cm   b) 2cm   c) 3cm   d) 4cm

19. The perimeter of a rectangle is 82m and its area is 400m2.The breadth of the rectangle is _____

a) 25m   b) 20m   c)16m   d) 9m

20. From a point A 10cm away from the centre of a circle a tangent AT of length 8cm is drawn, then the radius of the circle is _____

a) 12 cm   b) 10cm   c) 8cm   d) 6cm

SECTION –B

21. Find the HCF and LCM of 180 and 288 by prime factorization method.

22. Divide the polynomial $p(x) = x^4 - 3x^2 + 4x + 5$ by $g(x) = x^2 + 1 - x$ and find the quotient and the remainder

Or

If α and β are the zeros of the quadratic polynomial $f(x) = x^2 - x - 2$ find a polynomial whose zeros are $2\alpha + 1$ and $2\beta + 1$

23. If Sec $4A = $ cosec $(A-20^0)$ where $4A$ is an acute angle, find the value of A

24. Find the ratio in which the line segment A (-6,10) and B (3, -8) is divided by (-4 , 6)

Or

If the point P(k-1,2) is equidistant from the points A(3,k) and B(k,5) ,find the values of k.

25. Find the values of k for which the roots of the quadratic equation $2x^2 + kx + 8 = 0$ will have equal roots.

26. Two concentric circles are of radii 7cm and r cm respectively, where r > 7, a chord of the larger circle of length 48cm touches the smaller circle. Find the value of r

SECTION –C

27. Solve $8x + 5y = 9$ and $3x + 2y = 4$ by elimination method.

28. A plane left 30 minutes later than the schedule time and in order to reach its destination 1500km away in time it has to increase its speed by 250km/hr. from its usual speed. Find its usual speed.

29. If BL and CM are medians of a triangle ABC right angled at A then prove that $4(BL^2 + CM^2) = 5\ BC^2$

Or

In an equilateral triangle ABC, D is a point on side BC such that BD =BC/3. Prove that $9AD^2 = 7\ AB^2$

30. Prove the following:

i) $(\sin\theta + \text{cosec}\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$

ii) $\sqrt{\dfrac{1+ \sin\theta}{1- \sin\theta}} = \sec\theta + \tan\theta$

31. Prove that a parallelogram circumscribing a circle is a rhombus

Or

Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the Centre of the circle.

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

33. A motor boat whose speed is 18km/hr in still water takes 1 hr more to go 24km upstream than to return downstream to the same spot. Find the speed of the stream.

34. The probability of selecting a red ball at random from a jar that contains only red, blue and orange balls is ¼. The probability of selecting a blue ball at random from the same jar is $\dfrac{1}{3}$.If the jar contains 10 orange balls, find the total number of balls in the jar.

SECTION-D

35. Prove that $15 + 11\sqrt{3}$ is an irrational number.

Or

If the H.C.F of 152 and 272 is expressible in the form 272 X 8 + 152x, then find x

36. Find all the zeros of the polynomial $2x^4 + 7x^3 - 19x^2 - 14x + 30$, if two of its zeros are $\sqrt{2}$ and $-\sqrt{2}$
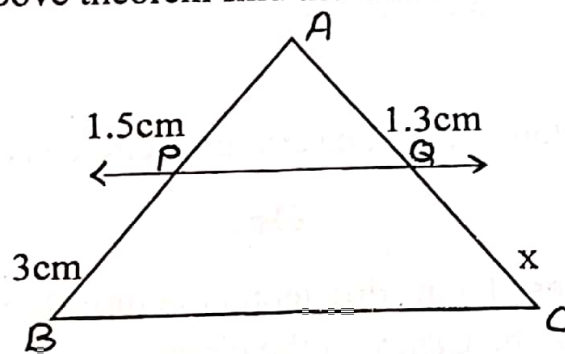
Or

Find all the zeros of the polynomial $x^4 - 3x^3 - x^2 + 9x - 6$, if two of its zeros are $\sqrt{3}$ and $-\sqrt{3}$

37. Solve the pair of linear equations graphically $x - y = 1$, $2x + y = 8$, shade the area bounded by these two lines and y-axis, also determine this area

38. i) State and prove Basic proportionality theorem.

  ii) Using the above theorem find the value of x if PQ ‖ BC

Or

  i)State and prove the Pythagoras theorem.

  ii)A ladder 10m long reaches a window 8m above the ground. Find the distance of the foot of the ladder from base of the wall.

39. If the points A(1,2) ,B(2,4) ,C(-3,2) and D (-4,-3) are the vertices of the parallelogram ABCD then taking AB as the base ,find the height of the quad. parallelogram.   (area)

40.A card is drawn at random from a well shuffled deck of playing cards. Find the probability that the card drawn is

i) a king or a jack

ii) a red card

iii) a black queen

iv) a face card