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9C 26

CARMEL CONVENT SCHOOL
Class- IX Session- 2022-23
Subject- Mathematics
Final Examination

Time Allowed: 3 Hrs.

Maximum Marks: 80

General Instructions:

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub- parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory.
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

SECTION A

- Q1 The rational number 0.33333..... can also be written as
a) 3 b) 3/10 c) 0.33 d) 1/3
- Q2 If the decimal representation of a number is non-terminating and non-recurring then the number is
a) natural number b) a rational number c) a whole number d) irrational number
- Q3 Degree of polynomial $4x^3 - 3x^4 + 9$ is
a) 4 b) 5 c) 8 d) 1
- Q4 A policeman And The Thief are equidistant from the Jewel box. Considering Jewel box as origin the position of policeman is (0,5) if the ordinate of the position of thief is zero then write the co-ordinate of the position of thief
a) (5,-5) b) (-5,0) c) (0,5) d) (0, -5)
- Q5 if X co-ordinate of point is zero then this point always lies
a) First quadrant b) Second quadrant c) On x-axis d) On y axis
- Q6 Find value of k if $x=2$ and $y=-1$ is a solution of the equation $2x + 2 + 3y = k$
a) 7 b) 3 c) -3 d) -1
- Q7 If coordinates of point P are P (-2, 3) and Q are Q (-3, 5) then subtract abscissa of Q from abscissa of P
a) -1 b) -1 c) 0 d) 5
- Q8 For every line l and point P not lying on it, the number of lines that pass through p and parallel to l are
a) 1 b) 2 c) no such line exists d) 3
- Q9 Line l is perpendicular to line m and line m is perpendicular to line n then line l is _____ to line n
a) parallel b) perpendicular c) intersecting d) none of these
- Q10 If a and b form linear pair and a: b is equal to 2:3 then find value of $2a + b$
a) 36 b) 72 c) 108 d) 252

Q11 Given two right triangles ABC and triangle PRQ such that angle A = 20° and angle Q = 20° degree and AC = QP right the correspondence if Triangles are congruent

- a) triangle ABC is congruent to Triangle PQR
- b) triangle ABC is congruent to Triangle PRQ triangle ABC is congruent to triangle RQP
- c) triangle ABC is congruent to Triangle QRP

Q12 Triangle ABC is an isosceles triangle with AC = BC and angle A = 70°

Find value of (angle A + angle B)

- a) 100°
- b) 110°
- c) 120°
- d) 140°

Q13. Find value of x if angles of quadrilateral are $7x$, $5x$, $3x$ and $3x$

- a) 10°
- b) 20°
- c) 30°
- d) 40°

Q14 Given quadrilateral ABCD and diagonal AC and BD intersect at P and also bisect each other at P such that AP is equals to CP and BP = DP also angle APD is equals to 90° degree then quadrilateral formed is a

- a) rhombus
- b) trapezium
- c) parallelogram
- d) rectangle

Q15 a circle divides the plane on which it lies in _____ parts a part 1 B part 2 C part 3 D part 4

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

Q16 Equal chords of a circle are _____ from the centre

- a) Parallel
- b) perpendicular
- c) equidistant
- d) none of the above

Q17 In a triangle if semi perimeter = $20\sqrt{5}$ then perimeter is equal to

- a) $200\sqrt{5}$
- b) $30\sqrt{5}$
- c) $40\sqrt{5}$
- d) $10\sqrt{5}$

Q18 Volume of two spheres are in the ratio 27: 125 find the ratio of the radii of two spheres

- a) 9: 25
- b) 9 : 5
- c) 3 : 5
- d) 1: 5

Q19 The height of a cone is 15cm. If the volume of cone is 1570 cm^3 . Find the radius of the base (Value of $\pi = 3.14$)

- a) 5 cm
- b) 10 cm
- c) 15cm
- d) 20 cm

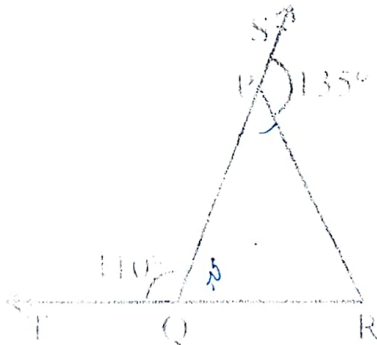
Q20 Class mark of class interval 0 - 50 is

- a) 20
- b) 25
- c) 30
- d) 35

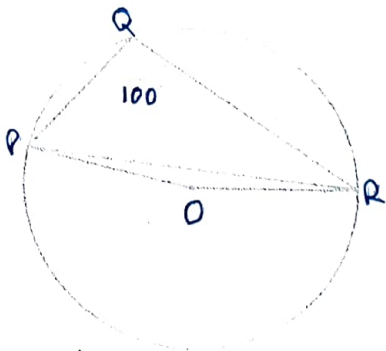
SECTION B

Q21 Check whether the polynomial $q(t) = 4t^3 + 4t^2 - t - 1$ is a multiple of $2t + 1$.

Q22 Sides QP and RQ of a triangle PQR are produced to points S and T respectively If angle SPR = 135° and angle PQT = 110° , find angle PRQ.



Q23 Angle PQR = 100° , where P, Q and R are points on a circle with centre O. Find angle OPR

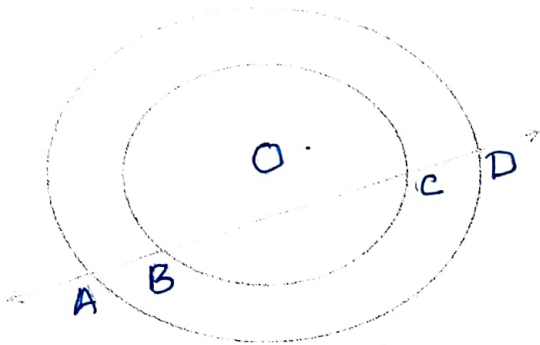


Q24 Find the area of triangle whose two sides are 8 cm and 11 cm and perimeter is 32 cm

Q25 Find the amount of water displaced by a solid spherical ball of diameter 0.21m.

SECTION C

Q26 If a line intersects two concentric circles with Centre O at points A, B, C, and D prove that $AB = CD$

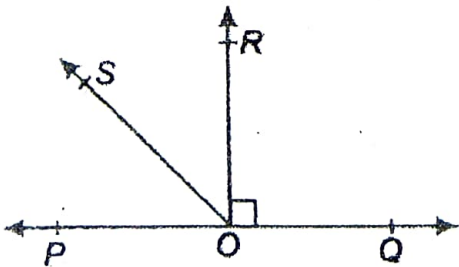


Q27 Draw graph for $y=3x$. Does the graph pass through origin?

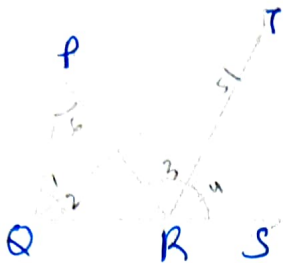
Q28 Prove that equal chords of a circle subtend equal angles at the centre.

Q29 The circumference of the base of a 10m high conical tent is 44 m. Find the length of the Canvas used in making the tent if width of canvas is 2 metres.

Q30 POQ is a line. OR is perpendicular to PQ. OS is another Ray lying between rays OP and OR prove that $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$



Q31 Side QR of triangle PQR is produced to point S. If bisectors of angle PQR and angle PRS meet at a point T, then prove that angle QTR = 1/2 angle QPR



SECTION D

Q32 a)

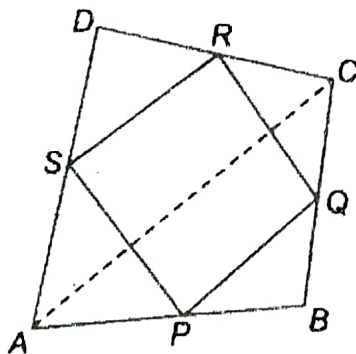
If $81y^2 - k = \left(9y + \frac{1}{2}\right)\left(9y - \frac{1}{2}\right)$, then the value of k is:

b)

If $\frac{(\sqrt{2}-1)}{(\sqrt{2}+1)} = x + y\sqrt{2}$,

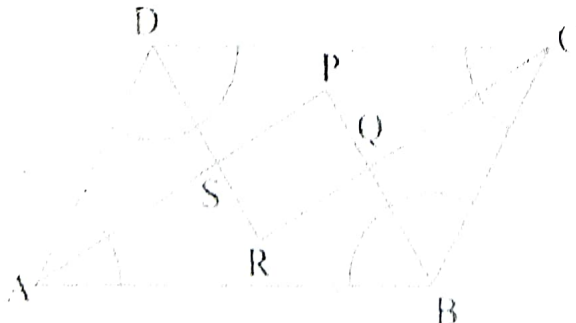
Q33 ABCD is a quadrilateral in which P, Q, R, S are mid points of sides AB, BC, CD and DA. AC is a diagonal. Show that

- i) SR is parallel to AC and SR is equal to half AC
- ii) PQ is equal to SR
- iii) PQRS is a parallelogram



OR

Show that bisectors of angles of a parallelogram form a rectangle



Q34. Factorize:

a) $63x^2 - 112y^2$

b) $8a^3 - b^3 - 12a^2b + 6ab^2$

Q35 Draw frequency polygon of data given below:

Age (in years)	15-20	20-25	25-30	30-35	35-40	40-45	45-50
No. of teachers	10	30	50	50	30	6	4

17.5

22.5

27.5

32.5

37.5

42.5

47.5

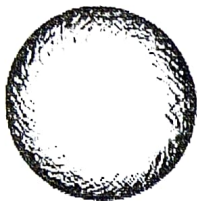
$\frac{15+20}{2} = \frac{35}{2} = 17.5$

SECTION E (CASE STUDY)

Q36

Various studies have shown that clay modelling is a great activity which helps in mental development in many ways. It involves both left and right brain. It promotes sensory development in teaching mathematics also. Clay modelling is used in classrooms by students of class 9. They were told to make two shapes – a hemispherical dome having circumference of base as 132cm

And a sphere with radius 7 cm



SPHERE

HEMISPHERES

125.525

Q a) Find radius of hemisphere

Q b) Find volume of sphere

Q c) Find total surface area of hemisphere

Q37

Gardening is fun and relaxing way to get in touch with nature. Gardening is an activity that's good for both mind and body.

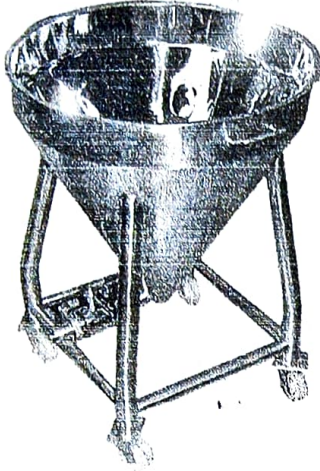


Seema is interested in gardening. She has prepared a kitchen garden in front of her house with dimensions X and Y as length and breadth respectively such that half the perimeter of rectangular garden is 36 m

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

- a) Find linear equation that gives relation between X and Y
- b) Find any two solutions of the equation formed
- c) Check if point (10, 26) is solution of the equation

Q38. Vessels are important part of Indian kitchen They are used in various ways –for heating, storage etc. Their shapes vary according to their uses .A cone shaped vessel was used to store pulses.



- a) What should be the radius of base if height of cone required is 15cm and its capacity is 1570cm^3
- b) Find volume of above vessel in litres
- c) Find height of conical vessel if $r=30\text{cm}$ and slant height =50cm

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