

CAREER POINT MOCK TEST PAPER

Class : 10th

Sub. : Mathematics

Duration : 3 Hours

Max. Marks : 90

GENERAL INSTRUCTIONS :

1. All questions are compulsory.
2. The question paper consists of 34 questions divided into the four Part A, B, C and D. Part– A comprises of 8 questions of 1 mark each. Part– B comprises of 6 questions of 2 marks each. Part– C comprises of 10 questions of 3 marks each and Part– D comprises of 10 questions of 4 marks each.
3. Questions no. 1 to 8 in Part– A are multiple choice questions where you have to select one correct option out of the give four.
4. There is no overall choice. However, internal choice has been provided in one question of two marks, three questions of three marks each and two questions of four marks each. You have to attempt only one of the alternatives in all such questions.
5. Write the serial number of questions before attempting.
6. In questions of construction, the drawing should be neat and clean and exactly as per the given measurements.
7. Use of calculator is not permitted.

PART-A

Question numbers 1 to 8 carry 1 mark each. For each of the questions 1-8, four alternative choices have been provided of which only one is correct. You have to select the correct choice.

- Q.1** For what value of k will $x^2 - (3k - 1)x + 2k^2 + 2k = 11$ have equal roots?
(A) 9, -5 (B) -9, 5 (C) 9, 5 (D) -9, -5
- Q.2** If sum of n terms of a sequence is given by $S_n = 2n^2 + 3n$, find its 50th term.
(A) 250 (B) 225 (C) 201 (D) 205
- Q.3** A circle touches the side BC of a ΔABC at P and AB produced at Q and AC produced at R . If the perimeter of the triangle is 12 cm the length $(AQ + AR)$ is equal to
(A) 8 cm (B) 10 cm (C) 12 cm (D) 15 cm
- Q.4** The sum of three numbers in A.P. is 27 and the sum of their squares is 293, find them.
(A) 4, 9, 14 (B) 6, 9, 12 (C) 7, 9, 11 (D) 8, 9, 10
- Q.5** If A & B are the points $(-3, 4)$ and $(2, 1)$, then the co-ordinates of the point C on AB produced such that $AC = 2BC$ are :
(A) $(2, 4)$ (B) $(3, 7)$ (C) $(7, -2)$ (D) $\left(-\frac{1}{2}, \frac{5}{2}\right)$

- Q.6** The probability that a randomly chosen number from one to twelve is a divisor of twelve is
 (A) $\frac{1}{12}$ (B) $\frac{1}{2}$ (C) $\frac{1}{4}$ (D) $\frac{1}{6}$
- Q.7** The value of x , for which the points $(x, -1)$, $(2, 1)$ and $(4, 5)$ lie on a line is
 (A) 0 (B) 1 (C) 2 (D) 3
- Q.8** Three cubes whose edges measure 3cm, 4cm and 5 cm respectively are melted to recast a single cube. The surface area of the new cube is
 (A) 216 cm^2 (B) 200 cm^2 (C) 215 cm^2 (D) 220 cm^2

PART- B

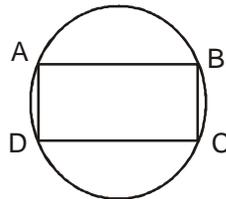
Question numbers 9 to 14 carry 2 marks each

- Q.9** The vertices of the triangle ABC are respectively A $(-1, 2)$, B $(3, 4)$ and C $(-5, 2)$. If D is the mid point of BD, then length of AD will be :

OR

Find the area of the quadrilateral ABCD whose vertices are A $(1, 1)$, B $(7, -3)$, C $(12, 2)$ and D $(7, 21)$ respectively.

- Q.10** If $2x$, $x + 10$, $3x + 2$ are in A.P, find the value of x .
- Q.11** A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears
 (i) A two digit number (ii) a perfect square number
- Q.12** Find the nature of roots of the equation $x^2 - 2x + 5 = 0$?
- Q.13** In given figure, find the area of the circle not included in the rectangle whose sides are 8cm and 6cm respectively.



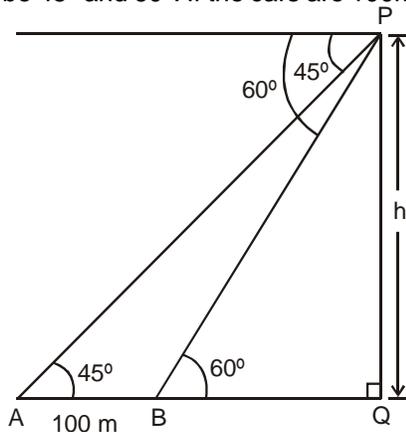
- Q.14** A circle touches all the four sides of a quadrilateral ABCD. Prove that $AB + CD = BC + DA$

PART- C

Question numbers 15 to 24 carry 3 marks each

- Q.15** If a, b, c are in A.P. and p is the A.M. between a & b , q is the A.M. between b and c prove that $p + q = 2b$
- Q.16** A vessel is in the form of an inverted cone. Its depth is 8 cm and the diameter of the top, which is open is 10 cm. It is filled with water upto the brim. When spherical bullets of radius 0.5 cm are dropped into the vessel, one fourth of the water flows out. Find number of bullets dropped in the vessel ?
- Q.17** Draw a pair of tangents to a circle of any convenient radius, which are inclined to the line joining the centre of the circle and the point at which they intersect at an angle of 45° . Also write the steps of construction.

- Q.18** From a balloon vertically above a straight road, the angles of depression of two cars at an instant are found to be 45° and 60° . If the cars are 100m apart, find the height of the balloon.



OR

From a point P on the circle of radius 4 cm, draw a tangent to the circle without using the centre. Also, write steps of construction.

- Q.19** A bag contains 12 balls out of which x are white.

- (i) If one ball is drawn at random, what is the probability that it will be a white ball?
 (ii) If 6 more white balls are put in the bag, then the probability of drawing a white ball will be double than that in (i). Find x.

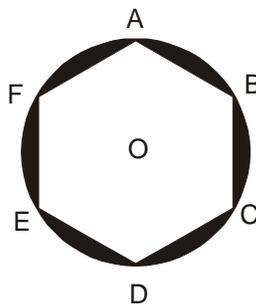
OR

Two customers are visiting a particular shop in the same week (Monday to Saturday). Each is equally likely to visit the shop on any day of the week. What is the probability that both will visit the shop on

- (i) the same day (ii) two different days (iii) consecutive days

- Q.20** Two cones have their heights in the ratio 1 : 3 and the radii of their bases are in the ratio 3 : 1, then find the ratio of their volumes?

- Q.21** A round table cover has six equal designs as shown in the figure. If the radius of the cover is 28 cm, find the cost of making the design at the rate of Rs. 0.35 per cm^2 .



- Q.21** A canal is 300 cm wide and 120 cm deep. The water in the canal is flowing with a speed of 20km/h. How much area will it irrigate in 20 minutes if 8cm of standing water is desired?

- Q.22** From a solid cylinder whose height is 2.4 cm and diameter 1.4cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm^2 . (use $\pi = 3.1416$)

- Q.23** If $2 - \sqrt{3}$ is a root of the quadratic equation $x^2 + 2(\sqrt{3} - 1)x + 3 - 2\sqrt{3} = 0$, then a second root is :

- Q.24** If D, E and F are the mid points of sides BC, CA and AB respectively of a ΔABC , whose vertices are A (-4,1), B(6,7) and C(2,-9), then prove that, Area $\Delta DEF = \frac{1}{4}$ (Area ΔABC).

PART- D

Question numbers 25 to 34 carry 4 marks each

Q.25 Find the sum of all the three digit numbers which leave remainder 2 when divided by 5.

OR

The sum of the first three terms of an AP is 33. If the product of the first and the third term exceeds the second term by 29, find the AP.

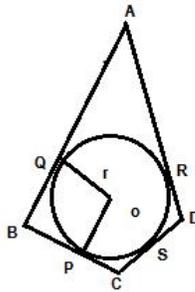
Q.26 The length of a hall is 5 m more than its breadth. If the area of the floor of the hall is 84 m^2 , what are the length and the breadth of the hall?

Q.27 In a class test, the sum of the marks obtained by a student P in Mathematics and Science is 28. Had he got 3 more marks in Mathematics and 4 marks less in Science, the product of marks obtained in the two subjects would have been 180. Find the marks obtained in the two subjects separately.

Q.28 Prove that the lengths of tangents drawn from an external point to a circle are equal.

OR

In given figure, a circle is inscribed in a quadrilateral ABCD in which $\angle B = 90^\circ$. If $AD = 23 \text{ cm}$, $AB = 29 \text{ cm}$, and $DS = 5 \text{ cm}$, find the radius r of the circle.



Q.29 The angle of elevation of the aeroplane from a point on the ground is 60° . After 15 seconds flight the elevation changes to 30° . If the aeroplane is flying at a height of $1500\sqrt{3} \text{ m}$ find the speed of the plane.

Q.30 Draw a triangle ABC with side $BC = 7 \text{ cm}$, $\angle B = 45^\circ$, $\angle A = 105^\circ$. Then construct a triangle whose sides are $(4/3)$ times the corresponding sides of $\triangle ABC$.

Q.31 A Shuttle cock used for playing badminton has the shape of frustum of a cone mounted on a hemisphere as shown in Fig. The external diameternal of the frustum are 5 cm and 2 cm, the height of the entire shuttle cock is 7 cm. Find its external surface area.

Q.32 A solid toy is in the form of a hemisphere surmounted by a right circular cone. Height of the cone is 2 cm and the diameter of the base is 4 cm. If a right circular cylinder circumscribes the solid. Find how much more space does cylinder covers than the solid toy.

Q.33 The coordinates of A, B, C are $(6, 3)$, $(-3, 5)$ and $(4, -2)$ respectively and P is any point (x, y) . Show that the ratio of the areas of triangles PBC and ABC is $\left| \frac{x + y - 2}{7} \right|$

Q.34 From an aeroplane vertically above a straight horizontal road, the angle of depression of two consecutive kilometer stone on opposite sides of aeroplane are observed to be α and β . Show that the height of aeroplane above the road is $\frac{\tan \alpha \tan \beta}{\tan \alpha + \tan \beta}$ kilometer.