

Attempt all questions from Section A and any four questions from Section B.

All working, including rough work, must be clearly shown and must be done on the same sheet as the rest of the answer.

Omission of essential working will result in loss of marks.

The intended marks for questions or parts of questions are given in brackets [].

SECTION A (40 Marks)

(Attempt all questions from this Section)

Question.1 : Choose the correct answer from the given four options.

[15]

- i) The roots of the quadratic equation $x^2 - 3x - 4 = 0$ are :-
 a) $(-4), 1$ b) $4, (-1)$ c) $4, 1$ d) $(-4), (-1)$
- ii) $a^{-n} =$ _____
 a) $\frac{1}{a^{-n}}$ b) $\frac{1}{a^n}$ c) $\frac{1}{a^{2n}}$ d) $\frac{1}{a^0}$
- iii) Factorisation of $49p^2 - 36q^2$ is :-
 a) $(7p + 6q)(7p - 6q)$ b) $(7p - 6)(7p + 6)$ c) $(7q + 6)(7q - 6)$ d) none of these
- iv) The value of $\sqrt{8} + \sqrt{18}$ is,
 a) $\sqrt{26}$ b) $2(\sqrt{2} + \sqrt{3})$ c) $5\sqrt{2}$ d) $6\sqrt{2}$
- v) The solution of the pair of linear equations $2x - y = 5$ and $5x - y = 11$ is,
 a) $x = -1, y = 2$ b) $x = 2, y = -1$ c) $x = 0, y = -5$ d) $x = -1, y = 3$
- vi) If 2 is a root of quadratic equation $2x^2 - kx + 1 = 0$, then the value of k is,
 a) 9 b) -9 c) $\frac{9}{2}$ d) $(-\frac{9}{2})$
- vii) $\sqrt[4]{\sqrt[3]{2^2}}$ is equal to ,
 a) $2^{\frac{1}{6}}$ b) 2^{-6} c) $2^{\frac{-1}{6}}$ d) 2^6
- viii) In ΔPQR , $\angle R = \angle P$, $QR = 4$ cm and $PR = 5$ cm. Then the length of PQ is ,
 a) 4 cm b) 5 cm c) 2 cm d) 2.5 cm
- ix) In ΔABC , $AB = 3$ cm, $BC = 4$ cm and $CA = 5$ cm. If D and E are mid-points of AB and BC respectively, then the length of DE is,
 (a) 1.5 cm (b) 2 cm (c) 2.5 cm (d) 3.5 cm

x) Three angles of a quadrilateral are 75° , 90° and 75° . The fourth angle is.

a) 90°

b) 95°

c) 105°

d) 120°

xi) AD is a diameter of a circle and AB is a chord. If AD = 34 cm and AB = 30 cm, then the distance of AB from the centre of circle is.

a) 17 cm

b) 15 cm

c) 4 cm

d) 8 cm

xii) Area of a triangle is 30 sq. cm. If its base is 10 cm, then the height is.

a) 5 cm

b) 6 cm

c) 7 cm

d) 8 cm

xiii) If $\cos A = \frac{4}{5}$, then the value of $\tan A$ is.

a) $\frac{3}{5}$

b) $\frac{3}{4}$

c) $\frac{4}{3}$

d) $\frac{5}{3}$

xiv) The value of $(\sin 45^\circ + \cos 45^\circ)$ is.

a) $\frac{1}{\sqrt{2}}$

b) 1

c) $\sqrt{2}$

d) $\frac{\sqrt{3}}{2}$

xv) The distance between the points A(0, 6) and B(0, -2) is.

a) 6 units

b) 8 units

c) 4 units

d) 2 units

Question : 2

a) A copper wire when bent in the form of an equilateral triangle has area $121\sqrt{3}$ sq. cm. If the same wire is bent into the form of a circle, find the area enclosed by the wire. [4]

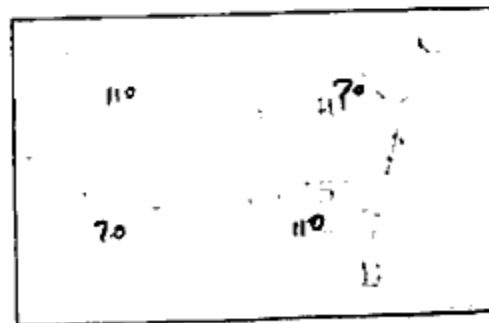
b) Solve $2x + y = 23$, $4x - y = 19$. Hence, find the values of $x - 3y$ and $5y - 2x$. [4]

c) AB and CD are two parallel chords of a circle of lengths 10 cm and 4 cm respectively. If the chords lie on the same side of the centre and the distance between them is 3 cm, find the diameter of the circle. [4]

Question : 3

a) Find a and b if:- $\frac{7 + \sqrt{5}}{7 - \sqrt{5}} - \frac{7 - \sqrt{5}}{7 + \sqrt{5}} = a + \frac{b}{11}\sqrt{5}$ [4]

b) In the figure given below, ABCD is a parallelogram. Find the values of x and y. [4]



c) In a class of 90 students, the marks obtained in a weekly test were as under. [5]

Marks	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50
No. of students	4	12	18	26	14	10	6

Draw frequency polygon for the above data.

SECTION B (40 Marks)

(Attempt any four questions from this Section)

Question : 4

- a) Find the value of x such that $PQ = QR$ where the coordinates of P, Q and R are $(6, -1)$, $(1, 3)$ and $(x, 8)$ respectively. [3]
- b) Find the area of triangle whose sides are 34 cm, 20 cm and 42 cm. [3]
- c) Factorise :- i) $64x^3 - 125y^3$, ii) $27x^4 - 8x$. [4]

Question : 5

- a) Solve the given system of simultaneous linear equation:- $3x + 4y = 10$, $2x - 2y = 2$. [3]
- b) Twice one number minus three times a second is equal to 2, and the sum of these numbers is 11. Find the numbers. [3]
- c) Solve the following :- i) $x^2 - 11x + 30 = 0$, ii) $4x^2 + 15 = 16x$. [4]

Question : 6

- a) Simplify :- $\left[5 \left\{ \left(\frac{1}{8} \right)^{-\frac{1}{3}} + \left(\frac{1}{27} \right)^{-\frac{1}{3}} \right\} \right]^{\frac{-1}{2}}$. [3]
- b) A chord of length 48 cm is drawn in a circle of radius 25 cm. Calculate its distance from the centre of the circle. [3]
- c) Two opposite angles of a parallelogram are $(3x - 2)^\circ$ and $(63 - 2x)^\circ$. Find all the angles of parallelogram. [4]

Question : 7

- a) Given A is an acute angle and $13 \sin A = 5$, evaluate :- $\frac{5 \sin A - 2 \cos A}{\tan A}$. [3]
- b) Find the value of :- $\frac{4}{3} \tan^2 30^\circ + \sin^2 60^\circ - 3 \cos^2 60^\circ + \frac{3}{4} \tan^2 60^\circ - 2 \tan^2 45^\circ$. [3]
- c) Show that :- $\tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ = 1$ [4]

Question : 8

- a) Rationalise the denominator of $\frac{5 - 3\sqrt{14}}{7 + 2\sqrt{14}}$. [3]
- b) If the numbers 3, 6, 7, 10, x , 15, 19, 20, 25, 28 are in ascending order and their median is 13, calculate the value of x . [3]
- c) The marks obtained (out of 25) by 15 students in a monthly test are :
11, 09, 07, 03, 18, 21, 13, 15, 18, 04, 06, 17, 22, 13, 15.
i) Find the mean of their marks.
ii) Find the mean of their marks when the marks of each student are increased by 2. [4]

Question : 9

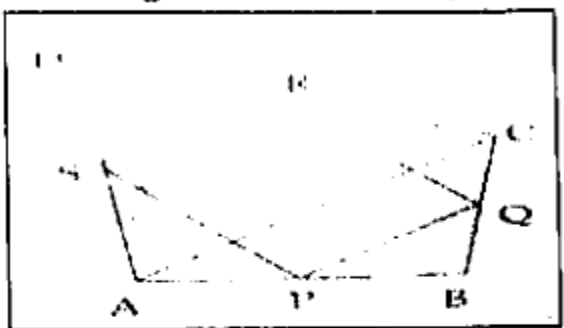
- a) If $5 \tan \theta = 4$, find the value of $\frac{5 \sin \theta - 3 \cos \theta}{5 \sin \theta + 2 \cos \theta}$. [3]
- b) The volume of cube is 729 cubic cm. Find its surface area and the length of a diagonal. [3]
- c) Solve :- $\frac{x-1}{x+1} = \frac{2x-5}{3x-7}$. [4]

Question : 10

a) Simplify :- $\left[(64)^{\frac{2}{3}} (2)^{-2} + 8^0 \right]^{\frac{-1}{2}}$ [3]

b) If 1 is added to the numerator of a fraction, it becomes $\frac{1}{5}$; if 1 is taken from the denominator, it becomes $\frac{1}{7}$, find the fraction. [3]

c) In the following figure, ABCD is a quadrilateral in which P, Q, R and S are mid points of AB, BC, CD and DA respectively. AC is the diagonal. [4]



Show that :- i) $SR \parallel AC$ and $SR = \frac{1}{2} AC$, ii) $PQ = SR$, iii) PQRS is a parallelogram.

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