

(Lahore Board)
2021, Class 10th
(Mathematics)
(Group I)

1. Two square roots of unity are:
 - (A) 1,-1
 - (B) 1, ω
 - (C) 1,- ω
 - (D) ω, ω^2
2. A circle has only one _____:
 - (A) Secant
 - (B) Chord
 - (C) Diameter
 - (D) Centre
3. The spread or scatterness of observations in a data set is called
 - (A) Average
 - (B) central tendency
 - (C) Dispersion
 - (D) Mean
4. The portion of a circle between two radii and an arc is called:
 - (A) Chord
 - (B) Segment
 - (C) Sector
 - (D) Diameter
5. Two linear factors of $x^2-15x+56$ are:
 - (A) $(x-7)$ & $(x+8)$
 - (B) $(x+7)$ & $(x-8)$
 - (C) $(x-7)$ & $(x-8)$
 - (D) $(x+7)$ & $(x+8)$
6. If $A \subseteq B$, then $A \cup B$ is equal to:
 - (A) A
 - (B) B
 - (C) ϕ
 - (D) A-B
7. Line segment joining any point of the circle to the centre is called:
 - (A) Radial segment
 - (B) Diameter
 - (C) Circumference
 - (D) Perimeter
8. In a proportion $a : b :: c : d$, b and c are called:
 - (A) Means

- (B) Extremes
- (C) Third proportional
- (D) Fourth proportional

9. The arcs opposite to incongruent central angles of a circle are always:

- (A) Congruent
- (B) incongruent
- (C) Parallel
- (D) Perpendicular

10. The domain of $R = \{(0,2), (2,3), (3,3), (3,4)\}$ is:

- (A) $\{0,3,4\}$
- (B) $\{2,3,4\}$
- (C) $\{0,2,4\}$
- (D) $\{0,2,3\}$

11. If α, β are the roots of $x^2 - x - 1 = 0$, then product of the roots 2α and 2β is:

- (A) -2
- (B) 2
- (C) 4
- (D) -4

12. if $y^2 \propto \frac{1}{x^3}$, then:

- (A) $y^2 = \frac{k}{x^3}$
- (B) $y^2 = \frac{1}{x^3}$
- (C) $y^2 = x^3$
- (D) $y^2 = kx^3$

13. A histogram is a set of adjacent:

- (A) squares
- (B) Rectangles
- (C) Circles
- (D) Triangles

14. Product of cube roots of unity is:

- (A) 0
- (B) 2
- (C) -1
- (D) 3

15. $\frac{\pi}{4}$ radians =:

- (A) 115°
- (B) 30°
- (C) 150°
- (D) 135°

(Lahore Board)
2021* Class10th
(Mathematics)
(Group -I)

Q. No. 2: Write short answers of any Six (6) question: 12

- i. Define reciprocal equation.
- ii. Solve by factorization $x^2-11x=152$
- iii. Solve: $x^2+2x-2=0$
- iv. Evaluate: $(1-3\omega-3\omega^2)^5$
- v. Find the product of complex cube roots of unity.
- vi. If the ratios $3x+1:6+4x$ and $2:5$ are equal, find the value of x .
- vii. If $y \propto \frac{1}{x}$ and $y = 4$, when $x=3$, find x when $y = 24$
- viii. Find ω^2 , if $\omega = \frac{-1\sqrt{-3}}{2}$
- ix. Find a third proportional to $(x-y)^2, x^3-y^3$

Q. No 3: Write short answers of any Six (6) question: 12

- i. Resolve into partial fractions: $\frac{x-11}{(x-4)(x+3)}$
- ii. What are partial fractions?
- iii. If $X = \{1,4,7,9\}$ and $Y = \{2,4,5,9\}$ then find $Y \cap X$
- iv. Define an onto function.
- v. If $A = N$ and $B = W$ then find the value of $B-a$.
- vi. If $L = \{a,b,c\}$, $M = \{d,e,f,g\}$ then find two binary relation in $L \times M$.
- vii. Find the arithmetic mean by direct method for the set of data:
200,225,350,375,270,320,290
- viii. Define class mark.
- ix. Name two measures of central tendency.

Q. No. 4: Write short answers of any Six (6) question: 12

- i. Find 'r', when $l=56\text{cm}$ and $\theta=45^\circ$
- ii. Define radian measure of an angle.
- iii. Express the angle 315° into radian.
- iv. State theorem of componendo and dividend.
- v. Find the fourth proportional to 8,7,6.
- vi. In $a\Delta ABC$ $a=17\text{cm}, b=15\text{cm}$ and $c=8\text{cm}$, find $m\angle B$.
- vii. Divide an arc of any length into four equal parts.
- viii. Write the closes quadrantal angles between which the angle $-3\pi/4$ lies.
- ix. Verify: $(1-\sin\theta)(1+\sin\theta)=\cos^2\theta$

Part (II)

Note: Attempt Three questions in all. But question no 9 is compulsory.

Q5 (a): Solve factorization: $\frac{x+1}{x} + \frac{x}{x+1} = \frac{25}{12}$ 4

(b): Find m. if the roots of the equation $x^2+7x+3m-5=0$ satisfy the relation $2\alpha - 2\beta = 4$ 4

Q6 (a) if $a:b=c:d$ ($a,b,c,d \neq 0$) then show that $\frac{a}{b} = \sqrt{\frac{a^2+c^2}{b^2+d^2}}$

(b) Resolve into partial fractions: $\frac{3x-11}{(x+3)(x^2+1)}$ 4

Q7 (a) if $U=\{1,2,3,4,5,6,7,8,9,10\}$, $A=\{1,3,5,7,9\}$ and $B=\{2,3,5,7\}$ then verify $(A \cup B)' = A' \cap B'$ 4

(b) Find the standard deviation "S" = : 9,3,8,8,9,8,9,18 4

Q8 (a) Verify the identity: $\frac{1+\sin\theta}{1-\sin\theta} - \frac{1-\sin\theta}{1+\sin\theta} = 4\tan\theta \sec\theta$ 4

(b) Draw circle which touches both the arms of angle: 45°

Q9 A straight line, drawn from the centre of a circle to bisect a chord (which is not a diameter) is perpendicular to the chord. 8

OR

If the angles subtended by two chords of a circle (or congruent circles) at the centre (corresponding centres) are equal, then chords are equal.

(Lahore Board)
2021, Class 10th
(Mathematics)
(Group II)

1. $\operatorname{cosec}^2 \theta - \cot^2 \theta =$ _____
- (A) $\tan \theta$
(B) 0
(C) -1
(D) 1
2. if $y^2 \propto \frac{1}{x^3}$ then :
- (A) $y^2 = \frac{k}{x^3}$
(B) $y^2 = \frac{1}{x^3}$
(C) $y^2 = x^2$
(D) $y^2 = kx^3$
3. A histogram is asset of adjacent:
- (A) squares
(B) rectangles
(C) circles
(D) data
4. The length of the diameter of a circle is how many times the radius of the circle:
- (A) 4 times
(B) 3 times
(C) 1 times
(D) 2 times
5. The number of elements in power set {1,2,3} is:
- (A) 4
(B) 6
(C) 8
(D) 9
6. Two square roots of unity are:
- (A) 1,-1
(B) 1, ω
(C) 1,- ω
(D) ω, ω^2
7. A line which has two points in common with a circle is called:
- (A) sine of a circle
(B) cosine of a circle

(C) tangent of a circle

(D) secant of a circle

8. The number of methods to solve a quadratic equation is:

(A) 1

(B) 2

(C) 3

(D) 4

9. $\frac{x^3 + 1}{(x - 1)(x + 2)}$ is _____:

(A) A proper fraction

(B) an improper fraction

(C) an identity

(D) a constant term

10. Cube roots of -1 are:

(A) $-1, -\omega, -\omega^2$

(B) $-1, \omega, -\omega^2$

(C) $-1, -\omega, \omega^2$

(D) $1, -\omega, -\omega^2$

11. If $A \subseteq B$, then $A \cap B$ is equal to:

(A) A

(B) B

(C) ϕ

(D) $\{\phi\}$

12. The semi circumference and the diameter of a circle both subtend a central angle of:

(A) 90°

(B) 180°

(C) 270°

(D) 360°

13. The most frequent occurring observation in a data set is called:

(A) mode

(B) median

(C) harmonic mean

(D) mean

14. Find x in proportion 4: x :: 5:15:

(A) $\frac{75}{4}$

(B) $\frac{4}{3}$

(C) $\frac{3}{4}$

(D) 12

15. Through how many non-collinear points can a circle pass:

- (A) one
- (B) two
- (C) three
- (D) four

(Lahore Board)
2021^e Class 10th
(Mathematics)
(Group -I)

Q. No. 2: Write short answers of any Six (6) question: 12

- i. Define reciprocal equation.
- ii. Solve by $\left(2x - \frac{1}{2}\right)^2 = \frac{9}{4}$
- iii. Solve: $\sqrt{3x^2} + x - 4\sqrt{3} = 0$
- iv. Discuss the nature of roots of equation $3x^2 + 7x - 13 = 0$
- v. Find ω^2 , if $\omega = \frac{-1 + \sqrt{-3}}{2}$
- vi. Write the quadratic equation having roots : -1,-7
- vii. If the ratios $3x+1 : 6+4x$ and $2 : 5$ are equal find the value of x.
- viii. $a \propto \frac{1}{b^2}$ and a =3 when b=4, find a when b =8
- ix. Find a mean proportional between $x^2 - y^2, \frac{x-y}{x+y}$

Q. No 3: Write short answers of any Six (6) question: 12

- i. Define a rational fraction.
- ii. Resolve into partial fractions: $\frac{x-11}{(x-4)(x+3)}$
- iii. State De Morgan's laws.
- iv. If $X = \{1,4,7,9\}$ and $Y = \{2,4,5,9\}$ then find $Y \cap X$
- v. If $A = N$ and $B = W$ then find the value of $B-A$.
- vi. Find a and b if $(3-2a, b-1) = (a-7, 2b+5)$
- vii. Define mode.
- viii. What is histogram?
- ix. Define standard deviation.

Q. No. 4: Write short answers of any Six (6) question: 12

- i. Define ratio and give one example.
- ii. Find the third proportional to 28 and 4.
- iii. Express 315.18^0 into D^0, M' and S'' form.
- iv. Convert $\frac{7\pi}{8}$ into degree.
- v. Prove that $(1 - \sin^2 \theta)(1 + \tan^2 \theta) = 1$
- vi. Find θ when $l=4.5m, r=2.5m$

- vii. Express the angle into radian : 135°
 viii. In ΔABC $a = 17\text{cm}$, $b = 15\text{cm}$ and $c = 8\text{cm}$, find $m\angle B$.
 ix. Divide an arc of any length into four equal parts.

Part (II)

Note : Attempt Three questions in all. But question no 9 is compulsory.

- Q5 (a):** Solve the equation by completing square: $7x^2 + 2x - 1 = 0$ 4
(b): Solve by using synthetic division if 3 and -4 are the roots of the equation
 $x^4 + 2x^3 - 13x^2 - 14x + 24 = 0$ 4
- Q6 (a)** Using theorem of componendo – dividend find the value of
 $\frac{x - 3y}{x + 3y} = \frac{x + 3z}{x - 3z}$ if $x = \frac{3yz}{y - z}$ 4
- (b)** Resolve into partial fractions: $\frac{x^2 + 7x + 11}{(x + 2)^2 (x + 3)}$ 4
- Q7 (a)** if $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $A = \{1, 3, 5, 7, 9\}$ and $B = \{1, 4, 7, 10\}$ then prove
 that $(A - B)' = A' \cup B'$ 4
- (b)** Find the standard deviation of five teachers salaries in rupees
 11500, 12400, 15000, 14500, 14800 4
- Q8 (a)** Verify the identity: $\frac{1 + \sin \theta}{1 - \sin \theta} - \frac{1 - \sin \theta}{1 + \sin \theta} = 4 \tan \theta \sec \theta$ 4
- (b)** Draw two equal circles of each radius 2.4cm . if the distance between
 their centres is 6cm then draw their transverse tangents.
- Q9** A straight line, drawn from the centre of a circle to bisect a chord (which is
 not a diameter) is perpendicular to the chord. 8

OR

Two tangents drawn to a circle from a point outside it are equal in length.