



**Al-Razi Guess Paper consist of 100 MCQs, 100 Short Questions and Long Questions to get 100% Success in Examination**

**OBJECTIVE TYPE**  
Multiple Choice Questions

1. The discriminant of the equation  $ax^2 + bx + c = 0$  is: (31★)  
 (A)  $b^2 - 4ac$  (B)  $-b^2 + 4ac$   
 (C)  $b^2 + 4ac$  (D)  $-b^2 - 4ac$
2. A circle has only one. (37★)  
 (A) Secant (B) Chord  
 (C) Diameter (D) Center
3. An arc subtends a central angle of  $40^\circ$  then the corresponding chord will subtend a central angle of: (30★)  
 (A)  $20^\circ$  (B)  $40^\circ$   
 (C)  $60^\circ$  (D)  $80^\circ$
4. Angle inscribed in a semi-circle is: (35★)  
 (A)  $\frac{\pi}{2}$  (B)  $\frac{\pi}{3}$  (C)  $\frac{\pi}{4}$  (D)  $\frac{\pi}{6}$
5. The extent of variation between two extreme observations of a data set is measured by: (10★)  
 (A) Variance (B) Mode  
 (C) Range (D) Irrational
6. Find  $x$  in proportion  $4 : x :: 5 : 15$ . (35★)  
 (A)  $\frac{3}{4}$  (B)  $\frac{4}{3}$  (C) 12 (D)  $\frac{75}{4}$
7. The tangents drawn at the ends of the diameter of a circle are: (28★)  
 (A) Parallel (B) Non-parallel  
 (C) Collinear (D) Perpendicular
8. If  $u \propto v^2$  then: (32★)  
 (A)  $u = v^2$  (B)  $u = kv^2$   
 (C)  $uv^2 = k$  (D)  $uv^2 = 1$
9. The third proportional of  $x^2$  and  $y^2$  is: (29★)  
 (A)  $\frac{y^2}{x^2}$  (B)  $x^2 y^2$   
 (C)  $\frac{y^4}{x^2}$  (D)  $\frac{x^2}{y^4}$
10. A 4cm long chord subtends a central angle of  $60^\circ$ . The radial segment of this circle is: (25★)  
 (A) 1cm (B) 2cm  
 (C) 3cm (D) 4cm
11. If  $\frac{u}{v} = \frac{v}{w} = k$  then: (25★)  
 (A)  $u = wk^2$  (B)  $u = vk^2$   
 (C)  $u = w^2k$  (D)  $u = v^2k$
12. Two square roots of unity are: (27★)  
 (A) 1, -1 (B) 1,  $\omega$   
 (C) 1,  $-\omega$  (D)  $\omega, \omega^2$
13.  $\frac{x^3 + 1}{(x-1)(x+2)}$  is \_\_\_\_: (26★)  
 (A) A proper fraction  
 (B) An improper fraction  
 (C) An identity  
 (D) A constant term
14. The power set of an empty set is: (25★)  
 (A)  $\phi$  (B)  $\{\phi\}$   
 (C)  $\{a\}$  (D)  $\{\phi, \{a\}\}$
15. If  $\alpha, \beta$  are the roots of  $3x^2 + 5x - 2 = 0$  then  $\alpha + \beta$  is: (25★)  
 (A)  $\frac{3}{5}$  (B)  $-\frac{2}{3}$  (C)  $\frac{5}{3}$  (D)  $-\frac{5}{3}$
16. A fraction in which the degree of the numerator is less than the degree of the denominator is called \_\_\_\_\_. (24★)  
 (A) Proper Fraction  
 (B) Improper Fraction  
 (C) Equation (D) Inequality
17. Out of two congruent arcs of a circle, if one arc make a central angle of  $30^\circ$ , then the other arc will subtend the central angle of: (5★)  
 (A)  $90^\circ$  (B)  $60^\circ$  (C)  $30^\circ$  (D)  $45^\circ$
18. Sum of the cube roots of unity is: (23★)  
 (A) 0 (B) 1 (C) -1 (D) 3
19. The fourth proportional w of  $x:y::v$  w is: (22★)  
 (A)  $\frac{vy}{x}$  (B)  $\frac{xy}{v}$  (C)  $xyv$  (D)  $\frac{x}{vy}$
20.  $\alpha^2 + \beta^2$  is equal to: (20★)  
 (A)  $\alpha^2 - \beta^2$  (B)  $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$   
 (C)  $(\alpha + \beta)^2 - 2\alpha\beta$   
 (D)  $\alpha + \beta$
21. The cube roots of -1 are: (22★)  
 (A) -1,  $-\omega, -\omega^2$  (B) -1,  $\omega, -\omega^2$   
 (C) 1,  $-\omega, -\omega^2$  (D) -1,  $-\omega, \omega^2$
22.  $\frac{1}{\alpha} + \frac{1}{\beta}$  is equal to: (21★)  
 (A)  $\frac{1}{\alpha}$  (B)  $\frac{1}{\alpha} - \frac{1}{\beta}$   
 (C)  $\frac{\alpha - \beta}{\alpha\beta}$  (D)  $\frac{\alpha + \beta}{\alpha\beta}$
23. Solution set of the equation  $4x^2 - 16 = 0$  is: (22★)  
 (A)  $\{\pm 4\}$  (B)  $\{4\}$   
 (C)  $\{\pm 2\}$  (D)  $\{2\}$
24. In the proportion  $a:b::c:d$ , b and c are called: (20★)  
 (A) Extremes  
 (B) Fourth Proportional  
 (C) Third Proportional  
 (D) Means
25. The different number of ways to describe a set is: (22★)  
 (A) 1 (B) 2 (C) 3 (D) 4
26. If  $\alpha, \beta$  are the roots of the  $7x^2 - x + 4 = 0$  then  $\alpha, \beta$  is: (20★)  
 (A)  $-\frac{1}{7}$  (B)  $\frac{4}{7}$  (C)  $\frac{7}{4}$  (D)  $-\frac{4}{7}$
27.  $\frac{2x + 1}{(x + 1)(x - 1)}$  is: (20★)  
 (A) An improper fraction  
 (B) An equation  
 (C) A proper fraction  
 (D) An Identity

28. The semi circumference and the diameter of a circle both subtend a central angle of \_\_\_\_\_. (18☆)  
 (A)  $90^\circ$  (B)  $180^\circ$  (C)  $270^\circ$  (D)  $360^\circ$
29. If  $a : b = x : y$  then the alternendo property is: (20☆)  
 (A)  $\frac{a}{x} = \frac{b}{y}$  (B)  $\frac{a}{b} = \frac{x}{y}$   
 (C)  $\frac{a+b}{b} = \frac{x+y}{y}$  (D)  $\frac{a-b}{x} = \frac{x-y}{y}$
30. If  $A \subseteq B$  then  $A \cap B$  is equal to: (18☆)  
 (A) A (B) B (C)  $\phi$  (D)  $\{ \phi \}$
31. The roots of the equation  $4x^2 - 5x + 2 = 0$  are: (17☆)  
 (A) Imaginary (B) Rational  
 (C) Irrational (D) Equal
32. If  $\frac{a}{b} = \frac{c}{d}$  then the componendo property is: (19☆)  
 (A)  $\frac{a}{a+b} = \frac{c}{c+d}$   
 (B)  $\frac{a}{a-b} = \frac{c}{c-d}$   
 (C)  $\frac{ad}{bc}$  (D)  $\frac{a-b}{b} = \frac{c-d}{d}$
33. If  $\alpha, \beta$  are the roots of  $x^2 - x - 1 = 0$ , then the product of  $2\alpha$  and  $2\beta$  is: (17☆)  
 (A) 2 (B) -2 (C) -4 (D) +4
34. A line which has two points in common with a circle is called: (19☆)  
 (A) Secant of a circle  
 (B) Cosine of a circle  
 (C) Tangent of circle  
 (D) Sine of circle
35. In the ratio  $a : b$ , a is called: (17☆)  
 (A) Relation (B) Antecedent  
 (C) Consequent (D) Proportion
36. If  $a : b = x : y$  then invertendo property is: (17☆)  
 (A)  $\frac{a}{x} = \frac{b}{y}$  (B)  $\frac{a}{a-b} = \frac{x}{x-y}$   
 (C)  $\frac{a+b}{b} = \frac{x+y}{y}$   
 (D)  $\frac{b}{a} = \frac{y}{x}$
37. The measure of the external angle of a regular hexagon is: (17☆)  
 (A)  $\frac{\pi}{3}$  (B)  $\frac{\pi}{4}$   
 (C)  $\frac{\pi}{6}$  (D)  $\frac{\pi}{2}$
38. The number of methods to solve a quadratic equation are: (17☆)  
 (A) 4 (B) 3 (C) 2 (D) 1
39.  $(x+3)^2 = x^2 + 6x + 9$  is a/an: (17☆)  
 (A) linear equation  
 (B) Equation (C) Identity  
 (D) None of these
40. Two tangents drawn to a circle from a point outside it are of \_\_\_\_\_ in length: (17☆)  
 (A) Half (B) Equal  
 (C) Double (D) Triple
41. In a ratio  $x : y$ , y is called: (15☆)  
 (A) Relation (B) Proportion  
 (C) Antecedent  
 (D) Consequent
42. Partial fractions of  $\frac{x+2}{(x+1)(x^2+2)}$  are of the form: (15☆)  
 (A)  $\frac{A}{x+1} + \frac{B}{x+2}$   
 (B)  $\frac{A}{x+1} + \frac{Bx+C}{x^2+2}$   
 (C)  $\frac{Ax+B}{x+1} + \frac{C}{x^2+2}$   
 (D)  $\frac{A}{x+1} + \frac{Bx}{x^2+2}$
43. The nature of the roots of equation  $ax^2 + bx + c = 0$  is determined by: (15☆)  
 (A) Sum of the roots  
 (B) Product of the roots  
 (C) Synthetic division  
 (D) Discriminant
44. If  $y^2 \propto \frac{1}{x^3}$  then: (15☆)  
 (A)  $y^2 = \frac{1}{x^3}$  (B)  $y^2 = \frac{k}{x^3}$   
 (C)  $y^2 = x^2$  (D)  $y^2 = bx^3$
45. The number of terms in the quadratic standard equation  $ax^2 + bx + c = 0$  is: (14☆)  
 (A) 1 (B) 2  
 (C) 3 (D) 4
46. Solution set of  $5x^2 = 15x$  is: (5☆)  
 (A)  $\{0\}$  (B)  $\{5\}$   
 (C)  $\{15\}$  (D)  $\{0,3\}$
47. Partial fractions of  $\frac{x^2+1}{(x+1)(x-1)}$  are of the form: (15☆)  
 (A)  $\frac{A}{x+1} + \frac{B}{x-1}$   
 (B)  $1 + \frac{A}{x+1} + \frac{Bx+C}{x-1}$   
 (C)  $1 + \frac{A}{x+1} + \frac{B}{x-1}$   
 (D)  $\frac{Ax+B}{x+1} + \frac{C}{x-1}$
48. If  $\alpha, \beta$  are the root of  $px^2 + qx + r = 0$  then the sum of  $2\alpha$  and  $2\beta$  is: (14☆)  
 (A)  $\frac{q}{2p}$  (B)  $\frac{2q}{p}$   
 (C)  $\frac{-q}{2p}$  (D)  $\frac{-2q}{p}$
49. The length of the diameter of a circle is how many times the radius of the circle? (15☆)  
 (A) 4 times (B) 3 times  
 (C) 2 times (D) 1 time
50. A pair of chords of a circle subtending two congruent central angles is: (13☆)  
 (A) Parallel (B) Incongruent  
 (C) Overlapping (D) Congruent
51. A line intersecting a circle is called: (15☆)  
 (A) Tangent (B) Secant  
 (C) Chord (D) Radius
52. If the side of a regular octagon is 3cm. Its perimeter will be: (15☆)  
 (A) 24 cm (B) 20 cm  
 (C) 21 cm (D) 6 cm
53. If  $b^2 - 4ac < 0$  then the root of  $ax^2 + bx + c = 0$  are: (13☆)  
 (A) Irrational (B) Rational  
 (C) Unreal (D) Real

54. Partial fractions of  $\frac{x-2}{(x-1)(x+2)}$  are of the form. (11★)
- Ⓐ  $\frac{A}{x-1} + \frac{B}{x+2}$   
 Ⓑ  $\frac{Ax}{x-1} + \frac{B}{x+2}$   
 Ⓒ  $\frac{A}{x-1} + \frac{Bx+C}{x+2}$   
 Ⓓ  $\frac{Ax+B}{x-1} + \frac{C}{x+2}$
55. An equation which remains unchanged when  $x$  is replaced by  $\frac{1}{x}$  is called a/an. (11★)
- Ⓐ Exponential Ⓑ Reciprocal  
 Ⓒ Radical Ⓓ Quadratic
56. A set with no elements is called: (12★)
- Ⓐ Null set Ⓑ Subset  
 Ⓒ Singleton set Ⓓ Super set
57. The length of a chord and the radial segment of a circle are congruent, the central angle made by the chord will be. (12★)
- Ⓐ  $30^\circ$  Ⓑ  $45^\circ$  Ⓒ  $60^\circ$  Ⓓ  $75^\circ$
58. Quadrant of the point  $(-1, 4)$  is: (12★)
- Ⓐ I Ⓑ II Ⓒ III Ⓓ IV
59. The arcs opposite to incongruent central angles of a circle are always: (12★)
- Ⓐ Parallel  
 Ⓑ Perpendicular  
 Ⓒ Congruent Ⓓ Incongruent
60. In a proportion  $a : b :: c : d$ ,  $a$  and  $d$  are called: (12★)
- Ⓐ Means  
 Ⓑ Fourth proportional  
 Ⓒ Extremes  
 Ⓓ Third proportional
61. The standard form of the quadratic equation is: (11★)
- Ⓐ  $bx + c = 0$ ,  $b \neq 0$   
 Ⓑ  $ax^2 = 0$ ,  $a \neq 0$   
 Ⓒ  $ax^2 = bx$ ,  $a \neq 0$   
 Ⓓ  $ax^2 + bx + c = 0$ ,  $a \neq 0$
62.  $(A \cup B) \cap C$  is equal to: (11★)
- Ⓐ  $A \cup (B \cap C)$  Ⓑ  $A \cap (B \cup C)$   
 Ⓒ  $(A \cup B) \cap C$  Ⓓ  $A \cap (B \cap C)$
63.  $\sin^2\theta + \cos^2\theta = \underline{\hspace{1cm}}$ : (10★)
- Ⓐ  $\sin\theta$  Ⓑ  $\cos\theta$   
 Ⓒ 1 Ⓓ 2
64. A tangent line intersects the circle at: (11★)
- Ⓐ Three points  
 Ⓑ No point Ⓒ Two points  
 Ⓓ One point
65. How many common tangents can be drawn between for two disjoint circles? (10★)
- Ⓐ 2 Ⓑ 3 Ⓒ 4 Ⓓ 1
66. If an arc of a circle subtends a central angle of  $60^\circ$  then the corresponding chord of the arc will make the central angle of: (11★)
- Ⓐ  $20^\circ$  Ⓑ  $40^\circ$  Ⓒ  $60^\circ$  Ⓓ  $80^\circ$
67. The circumference of a circle is called: (10★)
- Ⓐ Boundary Ⓑ Segment  
 Ⓒ Tangent Ⓓ Chord
68. The nature of the roots of equation  $ax^2 + bx + c = 0$  is determined by: (9★)
- Ⓐ Sum of the roots  
 Ⓑ Product of the roots  
 Ⓒ Synthetic division  
 Ⓓ Discriminant
69. Roots of the equation  $4x^2 - 4x + 1 = 0$  are: (9★)
- Ⓐ equal, real  
 Ⓑ unequal, real  
 Ⓒ imaginary Ⓓ irrational
70. If  $A$  and  $B$  are disjoint sets then  $A \cup B$  is equal to: (9★)
- Ⓐ  $A$  Ⓑ  $B$   
 Ⓒ  $\phi$  Ⓓ  $B \cup A$
71. Sum of the deviations of the variable  $X$  from its mean is always: (7★)
- Ⓐ Zero Ⓑ One  
 Ⓒ Same Ⓓ Different
72. Identity  $(5x+4)^2 = 25x^2 + 40x + 16$  is true for \_\_\_\_\_. (9★)
- Ⓐ One value of  $x$   
 Ⓑ Two values of  $x$   
 Ⓒ All values of  $x$   
 Ⓓ Three values of  $x$
73. The range of  $R = \{(1,3), (2,2), (3,1), (4,4)\}$  is: (9★)
- Ⓐ  $\{1,2,4\}$  Ⓑ  $\{3,2,4\}$   
 Ⓒ  $\{1,3,4\}$  Ⓓ  $\{1,2,3,4\}$
74. The solution set of the equation  $5x^2 - 125 = 0$  is: (9★)
- Ⓐ  $\{5\}$  Ⓑ  $\{10\}$   
 Ⓒ  $\{-5\}$  Ⓓ  $\{\pm 5\}$
75. If  $b^2 - 4ac > 0$  but a perfect square, then the roots of  $ax^2 + bx + c = 0$  are: (8★)
- Ⓐ Imaginary Ⓑ Rational  
 Ⓒ Irrational Ⓓ Perfect
76. A collection of well-defined objects is called: (9★)
- Ⓐ Subset Ⓑ Power set  
 Ⓒ Set Ⓓ Super set
77. The number of elements in power set of  $\{1,2,3,4\}$  is: (9★)
- Ⓐ 4 Ⓑ 8  
 Ⓒ 16 Ⓓ 0
78. The set  $\{x | x \in W \wedge x \leq 101\}$  is: (8★)
- Ⓐ Infinite set Ⓑ Subset  
 Ⓒ Null set Ⓓ Finite set
79.  $\omega \cdot \omega^2 = \underline{\hspace{1cm}}$ . (7★)
- Ⓐ  $\omega$  Ⓑ  $\omega^2$  Ⓒ  $-1$  Ⓓ 1
80.  $\frac{3\pi}{2}$  radians = \_\_\_\_\_. (7★)
- Ⓐ  $90^\circ$  Ⓑ  $180^\circ$   
 Ⓒ  $270^\circ$  Ⓓ  $60^\circ$
81. An equation of the type  $3^x + 3^{2-x} + 6 = 0$  is a/an: (6★)
- Ⓐ Exponential Ⓑ Radical  
 Ⓒ Reciprocal Ⓓ Quadratic
82. If  $(3 - 2a, b - 1) = (a - 7, 2b + 5)$  then  $a$  and  $b$  are: (9★)
- Ⓐ  $\frac{10}{3}, 6$  Ⓑ  $\frac{10}{3}, -6$   
 Ⓒ  $-\frac{10}{3}, 6$  Ⓓ  $-\frac{10}{3}, -6$
83. A fraction in which the degree of the numerator is greater than or equal to the degree of the denominator is called: (9★)
- Ⓐ Proper Fraction  
 Ⓑ Equation  
 Ⓒ Identity  
 Ⓓ Improper Fraction
84. In a continued proportion  $a : b = b : c$ ,  $ac = b^2$ ,  $c$  is said to be \_\_\_\_\_ proportional to  $a$  and  $b$ . (5★)
- Ⓐ Third Ⓑ Fourth  
 Ⓒ Means Ⓓ Fifth

85.  $(x + 3)^2 = x^2 + 6x + 9$  is:

- (A) an identity  
(B) a linear equation  
(C) polynomial  
(D) inequality

86. The radii of the same circle are: (5★)

- (A) All unequal  
(B) All equal  
(C) Double of diameter  
(D) Half of any chord

87. Circular region bounded by two radii and the corresponding arcs is called. (5★)

- (A) Circumference of a circle  
(B) Sector of a circle  
(C) Diameter of a circle  
(D) Segment of a circle

88.  $\sec\theta \cot\theta = \underline{\hspace{1cm}}?$  (9★)

- (A)  $\sin\theta$       (B)  $\frac{1}{\cos\theta}$   
(C)  $\frac{1}{\sin\theta}$       (D)  $\frac{\sin\theta}{\cos\theta}$

89.  $\operatorname{cosec}^2\theta - \cot^2\theta = ?$  (5★)

- (A)  $\tan\theta$  (B)  $-1$  (C)  $0$  (D)  $1$

90. A chord passing through the center of a circle is called: (5★)

- (A) Diameter (B) Radius  
(C) Circumference  
(D) Secant

91. The right bisectors of a circle always pass through: (5★)

- (A) Radius (B) Circumference  
(C) Center (D) Diameter

92. The symbol for a triangle is denoted by: (5★)

- (A)  $\Delta$  (B)  $\angle$  (C)  $\perp$  (D)  $\odot$

93. The distance from a point on a circle to its center is called: (5★)

- (A) Radius (B) Diameter  
(C) Chord (D) Arc

94. Locus of a point in a plane equidistant from a fixed point is called: (5★)

- (A) Radius (B) Diameter  
(C) Circumference  
(D) Circle

95. A complete circle is divided into: (5★)

- (A)  $90^\circ$  (B)  $180^\circ$   
(C)  $270^\circ$  (D)  $360^\circ$

96. The tangent and radius of a circle at the point of contact are: (5★)

- (A) Parallel  
(B) Not perpendicular  
(C) Perpendicular  
(D) Not parallel

97. Through how many non-collinear points, can a circle pass: (5★)

- (A) One (B) Two  
(C) Three (D) Four

98. If a chord of a circle subtends a central angle of  $60^\circ$ , then the length of the chord and the radial segment are: (5★)

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

99. The chord length of a circle subtending a central angle of  $180^\circ$  is always (5★)

- (A) Less than radius  
(B) Equal to radius  
(C) Double of radius  
(D) Triple of radius

100. In continued proportion  $a : b = b : c$ ,  $ac = b^2$ ,  $b$  is said to be ----- proportional between  $a$  and  $c$ : (7★)

- (A) Second (B) Third  
(C) Fourth (D) Mean

### Short Questions

1. Define proportion. (22★)

2. Define quadratic equation. (22★)

3. Define improper fraction. (25★)

4. Write De Morgan's laws. (25★)

5. What is proper fraction? (24★)

6. Evaluate:  $\omega^{37} + \omega^{38} - 5$  (24★)

7. Define sector of circle and draw its figure. (40★)

8. What is central angle? (35★)

9. Define a circle with diagram. (29★)

10. By using synthetic division, find the quotient and remainder of: (22★)

$$(x^3 + 3x^2 + 2) \div (x - 2)$$

11. Evaluate  $(1 - \omega + \omega^2)^6$  (22★)

12. What is meant by collinear and non-collinear points? (22★)

13. Evaluate:  $(1 - \omega - \omega^2)^6$  (18★)

14. If A and B are two sets, then represent  $A - B$  in set builder notation. (10★)

15. Define rational fraction. (21★)

16. Write the definition of exponential equation. (20★)

17. Define standard deviation. (20★)

18. Write three properties of arithmetic mean. (19★)

19. Find arithmetic mean by direct method. (19★)

$$12, 14, 17, 20, 24, 29, 35, 45$$

20. Simplify expression to a single trigonometric function:  $\sec^2x - 1$  (19★)

21. Define a chord and a diameter and explain their difference with the help of diagram. (21★)

22. State the difference between internal and external of circle by diagram. (21★)

23. Write the equation in standard form. (18★)

$$\frac{1}{x+4} + \frac{1}{x-4} = 3$$

24. Without solving, find the sum and the product of the roots of quadratic equation: (18★)

$$(l + m)x^2 + (m + n)x + n - l = 0$$

25. Without solving, find the sum and the product of the roots of quadratic equation: (18★)

$$2px^2 + 3qx - 4r = 0$$

26. Define a function. (18★)

27. Find fourth proportional of 6, 7, 8. (18★)

28. Define mode. (18★)

29. If  $A = N$  and  $B = W$  then find  $A - B$  (18★)

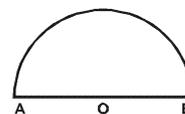
30. Prove that.  $\frac{\sin\theta + \cos\theta}{\cos\theta} = 1 + \tan\theta$  (18★)

31. If  $U = \{1, 2, 3, \dots, 10\}$ ,  $A = \{1, 3, 5, 7, 9\}$ ,  $B = \{2, 3, 4, 5, 8\}$  then find  $A' \cup B$  (18★)

32. Discuss the types of roots of the equation:  $x^2 + 6x - 1 = 0$  (17★)

33. If  $6 : x :: 3 : 5$  then find  $x$ . (17★)

34. By using synthetic division, find the quotient and remainder of:  
 $(x^3 + x^2 - 3x + 2) \div (x - 2)$   
 (16★)
35. Prove that:  
 $\sin^3\theta = \sin\theta - \sin\theta\cos^2\theta$  (17★)
36. Define proper fraction. (16★)
37. Find the range for the following weights of students.  
 110,109,84,89,77,104,74,97,49,59,103,62  
 (17★)
38. Write a quadratic equation having roots: -2, 3 (16★)
39. Find the cube roots of -1.  
 (15★)
40. Find the value of P if the ratios  $2P + 5 : 3P + 4$  and  $3 : 4$  are equal. (16★)
41. Find the sum and the product of the roots without solving the equation.  $3x^2 + 7x - 11 = 0$   
 (15★)
42. Find third proportional of 6,12. (15★)
43. Write a quadratic equation having roots: 0, -3. (14★)
44. Simplify expression to a single trigonometric function:  
 $\frac{\tan x}{\sec x}$  (15★)
45. Prove that:  $\frac{\sin^2\theta}{\cos\theta} + \cos\theta = \sec\theta$   
 (15★)
46. Define bijective function. Give an example. (15★)
47. Differentiate between circle and its circumference with diagram. (15★)
48. Solve by factorization:  $3y^2 = y(y-5)$ . (14★)
49. Define median. (15★)
50. If  $A = \{1,3,5,7,9\}$ ,  $B = \{1,4,7,10\}$  and  $C = \{1,2,3,\dots,10\}$  then find  $(A \cup B) \cap C$ . (15★)
51. If  $A = N$  and  $B = W$  then find  $B - A$  (14★)
52. Define inscribed and excribed circle. (15★)
53. Differentiate between chord and diameter of a circle.  
 (15★)
54. If  $(a - 4, b - 2) = (2, 1)$  then find a and b. (14★)
55. Define synthetic division. (13★)
56. Define simultaneous equations. (13★)
57. Find mean proportional of 16,49 (13★)
58. In a  $\Delta ABC$ ,  $a = 17\text{cm}$ ,  $b = 15\text{cm}$ ,  $c = 8\text{cm}$  find  $m\angle B$ . (14★)
59. Define one - one function and give an example. (14★)
60. If  $\alpha, \beta$  are the roots of the equation  $4x^2 - 5x + 6 = 0$  then find the value of  $\alpha^2\beta^2$ . (13★)
61. Solve  $\left(2x - \frac{1}{2}\right)^2 = \frac{9}{4}$  (13★)
62. Write formula for variance and standard deviation for ungrouped data. (13★)
63. Find standard deviation of 2, 3, 7, 6, 12. (13★)
64. Find standard deviation of 5, 18, 10, 15, 3, 7, 6, 12. (13★)
65. Define escribed circle. (13★)
66. Define major arc and minor arc with help of diagram. (13★)
67. Draw a circle of radius 4cm passing through points A and B, 5cm apart. (12★)
68. Find standard deviation 9, 3, 8, 8, 9, 8, 9, 18 (13★)
69. Define Histogram. (13★)
70. Prove that:  $\frac{\cos^2\theta}{\sin\theta} + \sin\theta = \text{cosec}\theta$   
 (13★)
71. Write in standard form:  
 $(x + 7)(x - 3) = -7$  (12★)
72. State theorem of componendo -dividendo. (12★)
73. Find discriminant of:  
 $9x^2 - 30x + 25 = 0$  (12★)
74. If  $V \propto R^3$  and  $V = 5$  when  $R = 3$  then find 'k'. (12★)
75. Find thrid proportional.  $a^3, 3a^2$  (12★)
76. Find the cube root of 8. (12★)
77. Find the cube root of 64. (12★)
78. Find the thrid proportional 4, 28 (12★)
79. If  $w \propto \frac{1}{\sqrt{v}}$  and  $w = 2$  when  $v = 3$  then find w. (12★)
80. Show  $A \cup (B \cap C)$  by Venn diagram. (12★)
81. If  $A = \{0,2,4\}$  then find  $A \times A$  (12★)
82. If  $Y = Z^+$  and  $T = O^+$  Find  $Y \cap T$ . (12★)
83. If  $(3-2a, b-1) = (a-7, 2b+5)$  then find a and b. (12★)
84. Prove that:  
 $(1 - \sin\theta)(1 + \sin\theta) = \cos^2\theta$   
 (12★)
85. What is meant by non-collinear points. (12★)
86. Define onto function. (12★)
87. Find harmonic mean of the data. 4, 8, 5, 12, (12★)
88. Define harmonic mean. 6, 9, 5, 10 (12★)
89. Simplify expression to a single trigonometric function:  
 $\frac{\sin^2 x}{\cos^2 x}$  (12★)
90. What is radius of a circle. (12★)
91. In the adjacent figure, find half the perimeter of circle with centre O if  $\pi \approx 3.1416$ ,  $m\overline{OA} = 20\text{cm}$  (12★)



92. Solve by factorization:  
 $4 - 32x = 17x^2$  (11★)
93. Solve  $x^2 + 2x - 2 = 0$  (11★)
94. Find discriminant of:  
 $x^2 - 3x + 3 = 0$  (11★)
95. Discuss the types of roots of the equation  $x^2 + 3x + 5 = 0$ . (11★)
96. Evaluate:  $(1 - 3\omega - 3\omega^2)^5$  (11★)
97. If  $A = \{a,b\}$  and  $B = \{c,d\}$  then  $A \times B$  (11★)
98. Write down the quadratic equations from the given roots 1, 5 (11★)
99. If  $\alpha, \beta$  are the roots of the equation  $x^2 - 5x + 7 = 0$  then find  $-\alpha - \beta$  (11★)
100. If 3, 12 and p are in continued proportional then find p. (11★)

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