



1. The value of  $[\log_{10}(5 \log_{10} 100)]^3$  is

- (1) 10  
 (2) 5  
 (3) 3  
 (4) 1

2. The value of  $\cos \frac{2\pi}{3}$  is

- (1) 0  
 (2)  $\frac{\sqrt{3}}{2}$   
 (3)  $\frac{1}{\sqrt{2}}$   
 (4)  $-\frac{1}{2}$

3. The value of  $\log \tan 1^\circ \log \tan 2^\circ \dots \log \tan 89^\circ$  is

- (1) 1  
 (2) 0  
 (3)  $\sqrt{3}$   
 (4)  $\frac{1}{\sqrt{3}}$

4. The value of

$$\cos 10^\circ + \cos 26^\circ + \cos 170^\circ + \cos 206^\circ + \cos 300^\circ$$

is

- (1) 1  
 (2) 2  
 (3)  $\frac{1}{2}$   
 (4)  $\frac{\sqrt{3}}{2}$

5. If  $\cos \theta = k$ ,  $0 < k < 1$  and  $\theta$  does not lie in the first quadrant, then  $\sin \theta =$

- (1)  $\sqrt{1-k^2}$   
 (2)  $-\sqrt{1-k^2}$   
 (3)  $-\frac{\sqrt{1-k^2}}{k}$   
 (4)  $-\frac{k}{\sqrt{1-k^2}}$

6. The value of  $\frac{\tan 60^\circ - \tan 30^\circ}{1 + \tan 60^\circ \tan 30^\circ} =$

- (1) 0  
 (2) 1  
 (3)  $\frac{1}{\sqrt{3}}$   
 (4)  $\sqrt{3}$

7. If  $\cos \theta + \sin \theta = \sqrt{2}$ , then  $\cos \theta - \sin \theta =$

- (1) 0  
 (2) 2  
 (3)  $\sqrt{2}$   
 (4)  $\frac{1}{2}$

8. If  $\tan \theta = \frac{x}{y}$ , then  $\frac{x \sin \theta - y \cos \theta}{x \sin \theta + y \cos \theta} =$

- (1)  $\frac{x-y}{x+y}$   
 (2)  $\frac{x+y}{x-y}$   
 (3)  $\frac{x^2-y^2}{x^2+y^2}$   
 (4)  $\frac{x^2+y^2}{x^2-y^2}$

9. Which of the following values of  $x$  satisfies  $\sin 30^\circ \cos x + \cos 30^\circ \sin x = 1$  ?
- (1)  $30^\circ$
  - (2)  $45^\circ$
  - (3)  $60^\circ$
  - (4)  $0^\circ$
10. The value of  $\tan 75^\circ$  is
- (1) 0
  - (2)  $\sqrt{3}$
  - (3)  $\frac{\sqrt{3}-1}{\sqrt{3}+1}$
  - (4)  $\frac{\sqrt{3}+1}{\sqrt{3}-1}$
11. A ladder of 10 mts height just touches the top of a wall. If the ladder makes an angle of  $60^\circ$  with the horizontal, then the height of the wall is
- (1)  $\frac{5}{\sqrt{3}}$  mts
  - (2)  $5\sqrt{3}$  mts
  - (3)  $10\sqrt{3}$  mts
  - (4)  $\frac{10}{\sqrt{3}}$  mts
12. The value of  $\frac{\sin^3 \theta}{1 - \cos \theta} + \frac{\cos^3 \theta}{1 + \sin \theta}$  is
- (1)  $\cos \theta - \sin \theta$
  - (2)  $\sin \theta - \cos \theta$
  - (3)  $\sin \theta + \cos \theta$
  - (4)  $2 \sin \theta - \cos \theta$
13.  $\sin 90^\circ + \cos 90^\circ + 2 \sin 45^\circ \cos 45^\circ =$
- (1) 1
  - (2)  $\frac{1}{\sqrt{2}}$
  - (3)  $\frac{1}{2}$
  - (4) 2
14. If a person aims at a bird on the top of a pole of height 7 mts with an elevation of  $60^\circ$ , then the distance of the pole from the person is
- (1)  $\frac{7}{\sqrt{3}}$  mts
  - (2)  $7\sqrt{3}$  mts
  - (3) 7 mts
  - (4)  $\sqrt{3}$  mts
15. If  $a = \sec \theta + \tan \theta$  and  $b = \sec \theta - \tan \theta$ , then by eliminating  $\theta$ , a relation between  $a$  and  $b$  is
- (1)  $\frac{a}{b} = 1$
  - (2)  $ab = 1$
  - (3)  $a + b = 1$
  - (4)  $a - b = 1$
16. If  $\sin(A + B) = \frac{\sqrt{3}}{2}$  and  $\cos(A - B) = \frac{\sqrt{3}}{2}$ , then
- (1)  $A = 60^\circ, B = 30^\circ$
  - (2)  $A = 45^\circ, B = 15^\circ$
  - (3)  $A = 45^\circ, B = 30^\circ$
  - (4)  $A = 60^\circ, B = 0^\circ$

17. If  $x = a \cos \theta$ ,  $y = a \sin \theta$ , then

- (1)  $x + y = a$
- (2)  $x - y = a$
- (3)  $x^2 + y^2 = a^2$
- (4)  $x^2 - y^2 = a^2$

18.  $3(\sin^2 45^\circ + \cos^2 225^\circ) - 3(\cos^2 45^\circ + \sin^4 45^\circ) =$

- (1)  $\frac{3}{\sqrt{2}}$
- (2)  $\frac{3}{4}$
- (3)  $\frac{1}{4}$
- (4) 0

19. The number of roots of the equation  $2 \sin^2 \theta + 3 \sin \theta + 1 = 0$  in  $[0, 2\pi]$  is

- (1) 4
- (2) 3
- (3) 2
- (4) 1

20. If  $\cot \theta + \operatorname{cosec} \theta = 5$ , then  $\sin \theta =$

- (1)  $\frac{5}{13}$
- (2)  $\frac{14}{5}$
- (3)  $\frac{13}{5}$
- (4)  $\frac{1}{13}$

21. The number of circles drawn through three non-collinear points in a plane is

- (1) 3
- (2) 4
- (3) 2
- (4) 1

22. In a  $\Delta ABC$ , if the circle is drawn on  $BC$  as diameter passes through  $A$ , then  $\Delta ABC$  is

- (1) an equilateral triangle
- (2) an obtuse-angled triangle
- (3) a right-angled triangle
- (4) an acute-angled triangle

23. The radii of two cylinders are in the ratio  $1 : 2$  and their heights are in the ratio  $5 : 3$ . The ratio of their volumes is

- (1)  $5 : 12$
- (2)  $7 : 12$
- (3)  $7 : 9$
- (4)  $8 : 11$

24. The angle subtended by a major arc at the centre is

- (1)  $90^\circ$
- (2)  $180^\circ$
- (3) less than  $180^\circ$
- (4) more than  $180^\circ$

25. If two circles of radii 5 cm and 7 cm touch internally, then the distance between their centres is

- (1) 12 cm
- (2) 2 cm
- (3) 24 cm
- (4) 6 cm

26. The angle between a tangent to a circle and the radius drawn at the point of contact is
- (1)  $90^\circ$
  - (2)  $60^\circ$
  - (3)  $45^\circ$
  - (4)  $30^\circ$
27. A point on the X-axis is
- (1) (2, 5)
  - (2) (3, 0)
  - (3) (0, 4)
  - (4) (0, -2)
28. The slope of a line parallel to the line  $4x - 3y + 1 = 0$  is
- (1)  $\frac{3}{4}$
  - (2)  $-\frac{3}{4}$
  - (3)  $\frac{4}{3}$
  - (4)  $-\frac{4}{3}$
29. If two lines intersect at right angles, then the product of their slopes is
- (1) 0
  - (2) 1
  - (3) -1
  - (4) 2
30. The slope of a line perpendicular to the line  $7x - 4y + 3 = 0$  is
- (1) -4
  - (2)  $-\frac{4}{7}$
  - (3)  $-\frac{7}{4}$
  - (4)  $\frac{4}{7}$
31. The ratio between two numbers is 5 : 6. If each number is reduced by 12, the ratio becomes 2 : 3. The first number is
- (1) 16
  - (2) 18
  - (3) 20
  - (4) 24
32.  $(285 + 235)^2 - 4 \times 285 \times 235 =$
- (1) 2620
  - (2) 2500
  - (3) 2740
  - (4) 3600
33. A sum of the present age of A, B and C is 81 years. Three years ago, their ages were in the ratio 1 : 2 : 3. The present age of B is
- (1) 12 years
  - (2) 24 years
  - (3) 27 years
  - (4) 36 years
34. The product  $\left(1 - \frac{1}{3}\right)\left(1 - \frac{1}{4}\right)\left(1 - \frac{1}{5}\right)\dots\left(1 - \frac{1}{n}\right) =$
- (1)  $\frac{2}{n(n-1)}$
  - (2)  $\frac{2}{n(n+1)}$
  - (3)  $\frac{2}{n}$
  - (4)  $\frac{1}{n}$

35. After two successive discounts, a saree with a list price of ₹ 500 is available at ₹ 225. If the second discount is 15%, the first discount is
- (1) 20%
  - (2) 25%
  - (3) 30%
  - (4) 40%
36. If the number  $5263x8$  is exactly divisible by 9, then the value of  $x$  is
- (1) 3
  - (2) 1
  - (3) 0
  - (4) 8
37. Ram purchases two articles at ₹ 860. He sells one at 15% profit and other at 10% loss. Then he neither gains nor loses. The cost price of each article is
- (1) ₹ 334, ₹ 526
  - (2) ₹ 344, ₹ 516
  - (3) ₹ 425, ₹ 435
  - (4) ₹ 542, ₹ 318
38. What least number must be added to 8234 so that the resulting number is exactly divisible by 5 and 3 together ?
- (1) 1
  - (2) 2
  - (3) 3
  - (4) 4
39. The l.c.m. of  $\frac{2}{5}$ ,  $\frac{5}{7}$  and  $\frac{7}{9}$  is
- (1) 35
  - (2) 70
  - (3)  $\frac{1}{315}$
  - (4) 140
40. A tank can be filled by 10 pumps in 20 minutes. If two pumps go out of order, what time will be taken by the remaining pumps ?
- (1) 22 minutes
  - (2) 24 minutes
  - (3) 25 minutes
  - (4) 30 minutes
41. If the sum of two numbers is 38 and the difference of their squares is 228, then the difference between the two numbers is
- (1) 4.
  - (2) 5
  - (3) 6
  - (4) 7
42. The ratio of the fourth proportional to 11, 15, 33 to the mean proportional between 9 and 25 is
- (1) 5 : 1
  - (2) 3 : 1
  - (3) 2 : 1
  - (4) 3 : 5
43. If 26 is divided into two parts such that 5 times the first part added to 3 times the second part makes 118, the first part is
- (1) 18
  - (2) 20
  - (3) 21
  - (4) 23
44. If 8 men or 10 boys can do a piece of work in 30 days, in what time will 12 men and 5 boys do the same work ?
- (1) 20 days
  - (2) 18 days
  - (3) 15 days
  - (4) 12 days

45. If in an election, a candidate secured 43% of the votes and the other candidate defeated him by 210 votes, the number of votes polled is
- (1) 1220
  - (2) 1470
  - (3) 1500
  - (4) 1680
46. The population of a town increases at a certain rate percent per annum. At present it is 32,000. In two years time it will be 40,000. What will it be in 4 years time?
- (1) 48,000
  - (2) 50,000
  - (3) 52,000
  - (4) 53,000
47. The denominator of a fraction is 2 more than the numerator. If 3 is added to both the numerator and the denominator, the fraction becomes  $\frac{4}{5}$ . The fraction is
- (1)  $\frac{3}{5}$
  - (2)  $\frac{5}{7}$
  - (3)  $\frac{7}{9}$
  - (4)  $\frac{9}{11}$
48. The side of a square whose area is three times the area of a rectangle whose length and breadth are respectively 12 m and 4 m, is
- (1) 10 m
  - (2) 11 m
  - (3) 12 m
  - (4) 14 m
49. A dealer purchased an article at  $\frac{4}{5}$  of its list price and sold 60% more than the list price. His gain percent is
- (1) 50%
  - (2) 75%
  - (3) 85%
  - (4) 100%
50. The cost price of a book, if by selling it for ₹ 47 one gets a gain of  $17\frac{1}{2}\%$ , is
- (1) ₹ 45
  - (2) ₹ 42
  - (3) ₹ 40
  - (4) ₹ 38
51. An invoice of ₹ 1,600 carries the terms cash 5,  $\frac{3}{10}$ ,  $\frac{2}{25}$ ,  $\frac{n}{45}$ . If the customer pays the bill on the fifth day, he gets a discount of
- (1) ₹ 90
  - (2) ₹ 48
  - (3) ₹ 32
  - (4) ₹ 30
52. Find the number which when successively divided by 2, 3, 5 leaves the remainder 1, 2 and 3 and the last quotient is 4.
- (1) 127
  - (2) 136
  - (3) 143
  - (4) 154

53. A man engaged a servant on the condition that he would pay him ₹ 13,200 and a dress after a year of service. If he served only for 8 months and got ₹ 8,600 and a dress, the price of the dress is
- (1) ₹ 200
  - (2) ₹ 400
  - (3) ₹ 500
  - (4) ₹ 600
54. 
$$\frac{(4.264)^3 + (3.736)^3}{(4.264)^2 - (4.264)(3.736) + (3.736)^2} =$$
- (1) 0.528
  - (2) 8
  - (3) 64
  - (4) 51.2
55. The value of  $2 + \sqrt{2} + \frac{1}{2 + \sqrt{2}} + \frac{1}{\sqrt{2} - 2} =$
- (1)  $2\sqrt{2}$
  - (2)  $\sqrt{2}$
  - (3) 1
  - (4) 2
56. If  $\frac{x}{y} = \frac{1}{7}$ , then  $\frac{7x + 3y}{7x - 3y} =$
- (1) 1
  - (2) -1
  - (3) 2
  - (4) -2
57. Which of the following numbers has rational square root?
- 0.025, 0.09, 0.9, 0.4.
- (1) 0.4
  - (2) 0.9
  - (3) 0.09
  - (4) 0.025
58. The smallest fraction among  $\frac{5}{7}, \frac{7}{8}, \frac{3}{4}, \frac{2}{3}$  is
- (1)  $\frac{5}{7}$
  - (2)  $\frac{2}{3}$
  - (3)  $\frac{3}{4}$
  - (4)  $\frac{7}{8}$
59. The least square number which is divisible by 10, 12, 15 and 18 is
- (1) 3600
  - (2) 1500
  - (3) 900
  - (4) 1800
60. What least fraction should be added to  $\sqrt{\frac{1.44}{2.89}} + \sqrt{\frac{16.9}{28.9}}$  so that the result is a whole number?
- (1)  $\frac{8}{17}$
  - (2)  $\frac{9}{17}$
  - (3)  $\frac{10}{17}$
  - (4)  $\frac{5}{17}$



61. The intersecting point of three medians of a triangle is called
- (1) orthocentre
  - (2) incentre
  - (3) centroid
  - (4) excentre
62. If P is the centroid of a right-angled triangle ABC and AB = 8 cm, BC = 6 cm and AC = 10 cm, then the length of BP is
- (1) 12 cm
  - (2) 13 cm
  - (3) 14 cm
  - (4) 5 cm
63. The equation of the line joining the points (-3, 2) and (0, 3) is
- (1)  $x - 3y - 9 = 0$
  - (2)  $x - 3y + 9 = 0$
  - (3)  $3x - y - 6 = 0$
  - (4)  $x - 3y + 6 = 0$
64. When slopes of two lines are  $m_1$  and  $m_2$ , then the angle between the lines is given by  $\tan \theta =$
- (1)  $\frac{m_1 m_2}{m_1 - m_2}$
  - (2)  $\frac{m_1 + m_2}{1 + m_1 m_2}$
  - (3)  $\frac{m_2 - m_1}{1 + m_1 m_2}$
  - (4)  $\frac{m_1 - m_2}{1 - m_1 m_2}$
65. The locus of the point whose distance to the coordinate axes are in the ratio 2 : 3 is
- (1)  $2x^2 - 3y^2 = 0$
  - (2)  $3x^2 - 2y^2 = 0$
  - (3)  $4x^2 - 9y^2 = 0$
  - (4)  $9x^2 - 4y^2 = 0$
66. If the area of a square field is 7200 sq. m, the length of its diagonal is
- (1) 360 m
  - (2) 180 m
  - (3) 160 m
  - (4) 120 m
67. If the cost of carpeting a room 6 m broad with a carpet at ₹ 3 per sq. m is ₹ 144, the length of the room is
- (1) 12 m
  - (2) 9 m
  - (3) 8 m
  - (4) 7 m
68. If the area of a rhombus is 96 sq. m and the length of one diagonal is 32 m, the length of the other diagonal is
- (1) 16 m
  - (2) 8 m
  - (3) 7 m
  - (4) 6 m
69. The radius of a circular plot whose circumference is 132 m, is
- (1) 42 m
  - (2) 21 m
  - (3) 12 m
  - (4) 10 m

70. If the surface area of a cube is 150 sq. m, its volume is
- (1)  $64 \text{ m}^3$
  - (2)  $125 \text{ m}^3$
  - (3)  $196 \text{ m}^3$
  - (4)  $27 \text{ m}^3$
71. If a regular hexagon is inscribed in a circle with diameter 8 cm, the side of the hexagon is
- (1) 2 cm
  - (2) 4 cm
  - (3) 12 cm
  - (4) 16 cm
72. If the diagonal of a rectangle is 12 cm and is twice the length of one of the sides, the area of the rectangle in sq. cm is
- (1) 36
  - (2)  $6\sqrt{3}$
  - (3)  $36\sqrt{3}$
  - (4)  $12\sqrt{3}$
73. The volume of a circular cylinder whose base is 4 cm in diameter and whose height is thrice this, is
- (1)  $12\pi$
  - (2)  $24\pi$
  - (3)  $6\pi$
  - (4)  $8\pi$
74. The ratio of the area of a square of side 4 cm and an equilateral triangle of side 4 cm is
- (1) 1 : 2
  - (2) 2 : 1
  - (3)  $4 : \sqrt{3}$
  - (4)  $2 : \sqrt{3}$
75. If three sides of a triangle are 3 cm, 4 cm and 5 cm respectively, then its area is
- (1)  $\sqrt{12}$  sq. cm
  - (2) 6 sq. cm
  - (3)  $\sqrt{32}$  sq. cm
  - (4)  $\sqrt{26}$  sq. cm
76. The diameter of a sphere is 12 cm. It is melted and drawn into a wire of diameter 0.2 cm. The length of the wire is
- (1) 28.8 m
  - (2) 2880 m
  - (3) 288 m
  - (4) 144 m
77. The material of the solid cone is collected into the shape of solid cylinder of equal radius. If the height of the cylinder is 6 cm, the height of the cone is
- (1) 12 cm
  - (2) 18 cm
  - (3) 3 cm
  - (4) 2 cm
78. If one angle of a triangle is  $60^\circ$  and the other two angles are in the ratio 3 : 1, then the smallest angle of the triangle is
- (1)  $40^\circ$
  - (2)  $30^\circ$
  - (3)  $60^\circ$
  - (4)  $45^\circ$

79. If the length of a rectangle is 5 cm more than its width and the area of the rectangle is 500 sq. cm, then the length is
- (1) 20 cm
  - (2) 30 cm
  - (3) 25 cm
  - (4) 35 cm
80. A circular road runs around a circular garden. If the difference between the circumference of outer and inner circles is 88 m, the width of the road is
- (1) 10 m
  - (2) 12 m
  - (3) 14 m
  - (4) 16 m
81. If the mean of five observations  $x$ ,  $x + 2$ ,  $x + 4$ ,  $x + 5$  and  $x + 9$  is 12, then the mean of the first three observations is
- (1) 6
  - (2) 8
  - (3) 9
  - (4) 10
82. If the frequency of the following classes 0 – 6, 6 – 12, 12 – 18 are 2, 3 and 5 respectively, then the mean of the group is
- (1) 8
  - (2) 6
  - (3) 4
  - (4) 3
83. If the heights of 10 boys are 5, 5.2, 5.6, 4.6, 4.5, 5.6, 5.1, 6, 5.6, 5, then the mode is
- (1) 5.6
  - (2) 5.2
  - (3) 5.1
  - (4) 5
84. The geometric mean of the numbers  $2, 2^2, 2^3, \dots, 2^7$  is
- (1)  $2^{2/7}$
  - (2)  $2^{7/2}$
  - (3)  $2^3$
  - (4)  $2^4$
85. The median of the marks of a student who gets 64, 58, 62, 76, 84, 85 and 87 marks in various subjects is
- (1) 64
  - (2) 76
  - (3) 84
  - (4) 85
86. The combined mean of three groups is 16 and the combined mean of the first two groups is 6. If the first, second and third groups has 2, 3 and 5 items respectively, then mean of the third group is
- (1) 20
  - (2) 26
  - (3) 30
  - (4) 32

87. In a series, if the coefficient of variation is 12 and mean is 25, the standard deviation is
- (1) 3
  - (2) 2
  - (3)  $\frac{2}{3}$
  - (4)  $2\sqrt{3}$
88. If the quartile deviation is 26 and the third quartile is 73, then the first quartile is
- (1) 24
  - (2) 22
  - (3) 21
  - (4) 20
89. If the arithmetic mean of two numbers is 10 and their geometric mean is 8, the numbers are
- (1) 12, 8
  - (2) 16, 4
  - (3) 15, 5
  - (4) 17, 3
90. For a certain frequency distribution, arithmetic mean is 3.2 and median is 4.1. Its mode is
- (1) 18.7
  - (2) 6.4
  - (3) 5.9
  - (4) 5.1
91. If  $x^2 - \frac{1}{x^2} + 6 = 0$ , then the value of  $x^6 - 3x^2 + \frac{3}{x^2} - \frac{1}{x^6}$  is
- (1) 0
  - (2) 18
  - (3) 216
  - (4) -216
92. The set of solutions of  $x^2 - 6x + 5 < 0$  is
- (1)  $\{x : 1 < x < 5\}$
  - (2)  $\{x : 2 < x < 3\}$
  - (3)  $\{x : 1 < x < 3\}$
  - (4)  $\{x : 2 < x < 5\}$
93. If a number increased by 15% gives 920, then the number is
- (1) 905
  - (2) 850
  - (3) 800
  - (4) 795
94. If  $3^x = 5^y = 15^{-z}$ , then  $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} =$
- (1) 1
  - (2) 3
  - (3)  $xy + yz + zx$
  - (4) 0
95. If  $(64)^2 (16)^x = (256)^{x-2}$ , then the value of x is
- (1) 1
  - (2) 5
  - (3) 7
  - (4) 9

96. A rational number equivalent to  $-\frac{32}{20}$  with the denominator 25 is
- (1)  $-\frac{24}{25}$
  - (2)  $-\frac{37}{25}$
  - (3)  $-\frac{40}{25}$
  - (4)  $-\frac{42}{25}$
97. The solution of  $|x - 1| < 6$  lies in
- (1)  $(-5, 7)$
  - (2)  $(-5, -7)$
  - (3)  $(-2, 5)$
  - (4)  $(5, -7)$
98. If  $A = \{x \mid x^2 - 3x + 2 = 0\}$  and  $B = \{x \mid x^2 + 3x - 4 = 0\}$ , then  $A \cap B$  is
- (1)  $\{1, 2\}$
  - (2)  $\{2\}$
  - (3)  $\{3\}$
  - (4)  $\{1\}$
99. If 56% men like tea and 73% like coffee, then the percentage of men who like both tea and coffee is
- (1) 17%
  - (2) 29%
  - (3) 34%
  - (4) 39%
100. If  $x^3 + mx - 15$  is exactly divisible by  $x - 3$ , then the value of  $m$  is
- (1) 1
  - (2) 3
  - (3) 4
  - (4) 5
101. The g.c.d. of  $x^3 - 1$  and  $x^4 + x^2 + 1$  is
- (1)  $x - 1$
  - (2)  $x^2 + x + 1$
  - (3)  $x^2 - x - 1$
  - (4)  $x^2 - x + 1$
102. The value of  $k$  for which the system of equations  $2x + 3y = 0$  and  $kx + 12y = 0$  have a non-zero solution, is
- (1) 4
  - (2) 6
  - (3) 8
  - (4) 9
103. If one root of the equation  $x^2 + px + 15 = 0$  is 3, while the equation  $x^2 + px + q = 0$  has equal roots, then the value of  $q$  is
- (1) 32
  - (2) 16
  - (3) 8
  - (4) 4
104. The value of  $\frac{(5^{2/3})(\sqrt[3]{5^8})}{\sqrt[3]{5^7}}$  is
- (1) 125
  - (2) 25
  - (3)  $\sqrt[3]{5}$
  - (4) 5
105. The solution set of the inequality  $2(x + 4) - 8 < 4(x - 3)$  is
- (1)  $(2, \infty)$
  - (2)  $(4, \infty)$
  - (3)  $(6, \infty)$
  - (4)  $(8, \infty)$

106. The minimum value of  $2x^2 + 4x + 7$  is
- (1) 7
  - (2) 5
  - (3) 4
  - (4) 2
107. If  $3^{3(n-1)} = \frac{1}{27^{n-3}}$ , then the value of n is
- (1) 0
  - (2) 1
  - (3) -1
  - (4) 2
108. When  $x = 3$ , the value of  $|2x - 3| + |x - 5|$  is
- (1) 1
  - (2) 5
  - (3) 7
  - (4) 8
109. If  $(A \cap B) = A$  and  $(B \cap C) = B$ , then  $A \cap C =$
- (1) C
  - (2)  $A \cup B$
  - (3) A
  - (4) B
110. If S and T are two sets such that S has 28 elements, T has 34 elements and S and T have no common elements, then the number of elements in  $S \cup T$  is
- (1) 38
  - (2) 62
  - (3) 6
  - (4) 0
111. One of the solutions of  $x + 2y \leq 7$ ,  $3x + y \leq 11$ ,  $x \geq 0$ ,  $y \geq 0$  is
- (1) (3, 2)
  - (2) (4, 3)
  - (3) (5, 2)
  - (4) (5, 7)
112. If one root of the equation  $7x^2 + 12x + k = 0$  is reciprocal of the other, then the value of k is
- (1) 3
  - (2) 4
  - (3) 7
  - (4) 12
113. If the difference of the roots of the equation  $x^2 - px + 6 = 0$  is 5, then the value of p is
- (1)  $\pm 6$
  - (2)  $\pm 7$
  - (3)  $\pm 8$
  - (4)  $\pm 9$
114. If x, y, z are real numbers, then
- $$\sqrt{x^{-1}y} \sqrt{y^{-1}z} \sqrt{z^{-1}x} =$$
- (1) xyz
  - (2)  $\sqrt{xyz}$
  - (3)  $\frac{1}{xyz}$
  - (4) 1
115. If a and b are positive integers such that  $a^2 - b^2$  is a prime number, then  $a^2 - b^2 =$
- (1)  $a - b$
  - (2)  $a + b$
  - (3) ab
  - (4) 4ab

116. Which one of the following numbers is exactly divisible by 3 ?
- (1) 134329
  - (2) 243769
  - (3) 534768
  - (4) 485992
117. The equation with rational coefficients for which one root is  $1 + i$ , is
- (1)  $x^2 + 2x + 2 = 0$
  - (2)  $x^2 - 2x + 2 = 0$
  - (3)  $x^2 - x + 1 = 0$
  - (4)  $x^2 + x + 1 = 0$
118. If  $A = \{2, 3, 4, 5, 7\}$ ,  $B = \{4, 6, 7, 8, 9\}$ ,  $C = \{3, 5, 7, 9, 10\}$ , then  $(A \cap B) \cup (A \cap C) =$
- (1)  $\{4, 5, 6, 7\}$
  - (2)  $\{3, 4, 6, 7\}$
  - (3)  $\{3, 4, 5, 7\}$
  - (4)  $\{3, 4, 7, 9\}$
119. The l.c.m. of  $3^7$ ,  $3^8$ ,  $3^{12}$  and  $3^9$  is
- (1)  $3^7$
  - (2)  $3^8$
  - (3)  $3^{12}$
  - (4)  $3^9$
120. If the expression  $4x^2 + kx + 12$  when divided by  $x - 1$  leaves a remainder zero, then the sum of the roots is
- (1) 3
  - (2) 4
  - (3) 6
  - (4) 2
121. The sum of three numbers A, B and C is 92. If  $A : B = \frac{2}{3}$  and  $B : C = \frac{5}{7}$ , then B is
- (1) 10
  - (2) 15
  - (3) 25
  - (4) 30
122. If the first three terms of a proportion are 4, 7 and 16, the fourth term is
- (1) 32
  - (2) 64
  - (3) 48
  - (4) 28
123. A and B can do a piece of work in 3 days, B and C in 6 days, C and A in 4 days. How long will C take to do it ?
- (1) 12 days
  - (2) 18 days
  - (3) 24 days
  - (4) 30 days
124. Two taps can separately fill a cistern in 10 minutes and 15 minutes respectively and when the waste pipe is open, they can together fill it in 24 minutes. The waste pipe can empty the full cistern in
- (1) 14 minutes
  - (2) 9 minutes
  - (3) 8 minutes
  - (4) 7 minutes

125. A train covers a distance of 10 km in 15 minutes. If its speed is decreased by 10 kmph, the time taken by it to cover the same distance is
- (1) 18 minutes
  - (2) 20 minutes
  - (3) 21 minutes
  - (4) 22 minutes
126. A certain number when divided by 42 leaves a remainder 26. The remainder when the same number be divided by 14 is
- (1) 10
  - (2) 11
  - (3) 12
  - (4) 2
127. P travels  $\frac{3}{5}$  of the total journey by train,  $\frac{4}{15}$  by bus and the remaining 6 km on foot. His total journey is
- (1) 50 km
  - (2) 45 km
  - (3) 40 km
  - (4) 35 km
128. If the numbers 169, 248, 416, 975, 517, 612 and 345 are arranged in the descending order based on the sum of the digits of each number, the middle number will be
- (1) 345
  - (2) 416
  - (3) 612
  - (4) 517
129. Two cars A and B start at the same time from  $P_1$  and  $P_2$  which are 80 km apart. If the two cars travel in opposite directions, they meet after one hour and if they travel in the same direction, then A meets B after 5 hours. The speed of car A is
- (1) 16 kmph
  - (2) 24 kmph
  - (3) 48 kmph
  - (4) 32 kmph
130. In what time will the interest on ₹ 400 amount to ₹ 56 at 7% per annum simple interest ?
- (1) 5 years
  - (2) 4 years
  - (3) 3 years
  - (4) 2 years
131. When the rate of interest in a bank is reduced from 5% to 4%, a man deposits ₹ 1,500 and his annual income remains the same. The original deposit is
- (1) ₹ 7,500
  - (2) ₹ 6,000
  - (3) ₹ 5,200
  - (4) ₹ 4,500
132. The sum of all odd numbers from 1 to 140 is
- (1) 19600
  - (2) 4920
  - (3) 4900
  - (4) 4970



133. The number of different prime factors used in  $(15)^9 (51)^{11} (55)^{21}$  is
- (1) 4
  - (2) 41
  - (3) 6
  - (4) 82
134. What annual payment will discharge a debt of ₹ 1,148 due in 2 years at the rate of 5% compound interest ?
- (1) ₹ 510
  - (2) ₹ 520
  - (3) ₹ 540
  - (4) ₹ 560.
135. If the difference between the simple and compound interest on a certain amount for 2 years at 5% is ₹ 125, then the amount is
- (1) ₹ 25,000
  - (2) ₹ 50,000
  - (3) ₹ 5,000
  - (4) ₹ 12,500
136. The value of  $\log_5 16 \log_4 5$  is
- (1) 0
  - (2) 1
  - (3) 2
  - (4) 4
137. If  $\log_{10} 2 = 0.3010$ , then the number of digits in  $16^{50}$  is
- (1) 60
  - (2) 61
  - (3) 602
  - (4) 30
138. If  $0 < a < 1$ , then  $x > y$  implies
- (1)  $\log_a x < \log_a y$
  - (2)  $\log_a x > \log_a y$
  - (3)  $\log_a x = \log_a y$
  - (4)  $a^{\log_a x} > a^{\log_a y}$
139. The number of prime factors in  $(35)^2 \times 250 \times (216)^{2/3}$  is
- (1) 3
  - (2) 5
  - (3) 12
  - (4) 14
140. The value of  $\log_a a + \log_a a^3 + \log_a a^5 + \dots + \log_a a^{2n-1}$  is
- (1)  $n(n+1)$
  - (2)  $n^2 - 2$
  - (3)  $n^2$
  - (4)  $\frac{n(n+1)}{2}$
141. If the sum of the roots and product of the roots of a quadratic equation are  $\frac{15}{6}$  and  $\frac{1}{2}$  respectively, the equation is
- (1)  $2x^2 - 15x + 3 = 0$
  - (2)  $6x^2 - 15x + 3 = 0$
  - (3)  $x^2 - 30x + 2 = 0$
  - (4)  $6x^2 - 15x + 1 = 0$
142. If  $f(x) = x^2 - 4$  and  $g(x) = x^3 - 3$ , then  $(g \circ f)(-2) =$
- (1) 0
  - (2) -3
  - (3) 3
  - (4) 5

143. A factor of the polynomial  $x^3 - 4x^2 + 5x - 6$  is
- (1)  $x - 1$
  - (2)  $x - 2$
  - (3)  $x + 2$
  - (4)  $x - 3$
144. The solutions to the equation  $x^2 - 10x + 24 > 0$  is
- (1)  $5 < x < 2$
  - (2)  $2 < x < 5$
  - (3)  $4 < x < 6$
  - (4)  $-4 < x < 6$
145. If  $x^3 + x^2 - 4x - 2$  is divided by  $x + 1$ , the remainder is
- (1)  $-2$
  - (2)  $2$
  - (3)  $0$
  - (4)  $-1$
146. If the length of a hall exceeds its breadth by 6 m and its area is  $160 \text{ m}^2$ , the length of the hall is
- (1) 16 m
  - (2) 10 m
  - (3) 12 m
  - (4) 8 m
147. If  $x^3 - 3x^2 + 5x + k$  is exactly divisible by  $x - 2$ , then the value of  $k$  is
- (1) 4
  - (2) 0
  - (3) 6
  - (4)  $-6$
148. If  $4x + 3y = 15$  and  $xy = 6$ , then the value of  $16x^2 + 9y^2 =$
- (1) 25
  - (2) 81
  - (3) 90
  - (4) 225
149. If  $4x^3 - 3x + 9$  is divided by  $2x - 3$ , the remainder is 18 and the quotient is
- (1)  $4x^2 + 6x + 6$
  - (2)  $2x^2 + 3x + 3$
  - (3)  $x^2 + 3x + 1$
  - (4)  $2x^2 + x + 3$
150. The sum of the roots of the quadratic equation  $3x^2 + 5x + 7 = 0$  is
- (1)  $-\frac{5}{3}$
  - (2)  $\frac{5}{3}$
  - (3)  $\frac{7}{3}$
  - (4)  $-\frac{7}{3}$