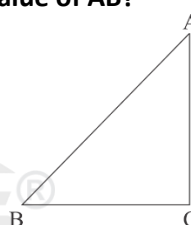**No of Questions: 100**   **Time: 2 (Hours)**

1. **What least number should be subtracted from 26492518, so that the resulting number is divisible by 3 but not by 9?**
   a) 1
   b) 3
   c) 4
   d) 7

2. **Assertion a):** Zero is a whole number.
   Reason (R): Every integer is a whole number.
   a) A and R are correct but R is correct explanation of A
   b) A and R are correct but R is not correct explanation of A
   c) A is correct but R is wrong
   d) A is wrong but R is correct

3. **What is the total number of three digit three digit numbers with unit digit 7 and divisible by 11?**
   a) 6
   b) 7
   c) 8
   d) 9

4. **When a polynomial is divided by a linear polynomial, then what is the remainder?**
   a) Constant polynomial only
   b) Zero polynomial only
   c) Either constant or zero polynomial
   d) Linear polynomial

5. **If the 14th term of an arithmetic series is 6 and 6th term is 14, then what is the 95th term?**
   a) -75
   b) 75
   c) 80
   d) -80

6. **ABC is a triangle and AD is perpendicular to BC. It is given that the lengths of AB, BC, CA are all rational numbers. Which one of the following is correct?**
   a) AD and BD must be rational
   b) AD must be rational but BD need not be rational
   c) BD must be rational but AD need not be rational
   d) Neither AD nor BD need be rational

7. **How many rational numbers are there between 1 and 1000?**
   a) 998
   b) 999
   c) 1000
   d) Infinite

8. **Which one of the following numbers is divisible by 11?**
   a) 45678940
   b) 54857266
   c) 87524398
   d) 93455120

9. **Consider the following statements:**
   I. 7710312401 is divisible by 11.
   II. 173 is a prime number.

Which of the statements given above is/are correct?
   a) Only I
   b) Only II
   c) Both I and II
   d) Neither I nor II

10. **How many pairs of X and Y are possible in the number 763X4Y2, if the number is divisible by 9?**
    a) 8
    b) 9
    c) 10
    d) 11

11. **A person goes to a market between 4 p.m. and 5 p.m. When he comes back, he finds that the hour hand and minute hand have interchanged their positions. For how much time (approximately) was he out of his house?**
    a) 55.25 minutes
    b) 55.30 minutes
    c) 55.34 minutes
    d) 55.38 minutes

12. **If the HCF of $x^3 + mx^2 - x + 2m$ and $x^2 + mx - 2$ is a linear polynomial, then what is the value of m?**
    a) 1
    b) 2
    c) 3
    d) 4

13. **What is the value of k for which the HCF of $2x^2 + kx - 12$ and $x^2 + x - 2k - 2$ is $(x + 4)$?**
    a) 5
    b) 7
    c) 10
    d) -4

14. **If f (x) and g (x) are two polynomials with integral co-efficient which vanish at x = 1/2, then what is the factor of HCF of f (x) and g (x)?**
    a) $x - 1$
    b) $x - 2$
    c) $2x - 1$
    d) $2x + 1$

15. **The HCF and LCM of two natural numbers are 12 and 72, respectively. What is the difference between the two numbers, if one of the numbers is 24?**
    a) 12
    b) 18
    c) 21
    d) 24

16. **What is the number of integral solutions of the equations HCF (a, b) = 5 and a + b = 65?**
    a) None
    b) Infinitely many
    c) Less than 65
    d) Exactly one

17. **What is the value of 2.6 1.9 ?**
    a) 0.6
    b) 0.9
    c) 0.7
    d) 0.7

18. **The sum of the square of a number and the square of the reciprocal of the number, is thrice the difference of the square of the number and the square of the reciprocal of the number. What is the number?**
    a) 1
    b) $2^{1/4}$
    c) $3^{1/3}$
    d) $4^{1/4}$

19. 15. A ball is dropped from a height 64 m above the ground and every time it hits the ground it rises to a height equal to half of the previous. What is the height attained after it hits the ground for the 16th time?
    a) 2^{-12} m
    a) 2^{-11} m
    c) 2^{-10} m
    d) 2^{-9} m

20. The number of workers in the employment guarantee scheme increased by 15 which resulted into an increase of 20%. What was the initial number of workers?
    a) 60
    b) 75
    c) 80
    d) 90

21. The radius of the base of a right circular cone is increased by 15% keeping the height fixed. The volume of the cone will be increased by
    a) 30%
    b) 31%
    c) 32.25%
    d) 34.75%

22. In a mixture of 80l, the ratio of milk and water is 3: If the ratio of milk and water is to be 2: 3 the how much amount of water is to be further added?
    a) 70 l
    b) 80 l
    c) 100 l
    d) 140 l

23. A bag contains Rs 114 in the form of Rs 1, 50 paise and 10 paise coins in the ratio 3: 4: 10. What is the number of 50 paise coins?
    a) 76
    b) 72
    c) 56
    d) 48

24. The ratio of A to B is x: 8 and the ratio of B to C is 12 : z. If the ratio of A to C is 2: 1, then what is the ratio of x: z?
    a) 2: 3
    b) 3: 2
    c) 4: 3
    d) 3: 4

25. Sex ratio is defined as the number of females per 1000 males. In a place, the total inhabitants are 1935000 out of which 935000 are females. What is the sex ratio for the place?
    a) 935
    b) 1000
    c) 1935
    d) 9350

26. An aeroplane flies along the four sides of a Square at a speed of 100, 200, 300 and 400 km/h, respectively. What is the average speed of the plane in its flight around the square?
    a) 192 km/h
    b) 200 km/h
    c) 250 km/h
    d) None of these

27. The average weight of a class of 15 boys and 10 girls is 38.4 kg. If the average weight of the boys is 40 kg, then what is the average weight of the girls?
    a) 36.5 kg
    b) 35 kg
    c) 36 kg
    d) 34.6 kg

28. A person borrowed Rs 7500 at 16% compound interest. How much does he have to pay at the end of 2 years to clear the loan?
    a) Rs 9900
    b) Rs 10092
    c) Rs 11000
    d) Rs 11052

29. When an article is sold at 20% discount, the selling price is Rs24. What will be the selling price when the discount is 30%?
    a) Rs 25
    b) Rs 23
    a) Rs 21
    d) Rs 20

30. A refrigerator and a camera were sold for Rs 12000 each. The refrigerator was sold at a loss of 20% of the cost and the camera at a gain of 20% of the cost. The entire transaction results in which one of the following?
    a) No loss or gain
    b) Loss of Rs 1000
    c) Gain of Rs 1000
    d) Loss of Rs 2000

31. On selling an article for Rs 240, a trader loses 4%. In order to gain 10%, he must sell the article for
    a) Rs 275
    b) Rs 280
    c) Rs 285
    d) Rs 300

32. A person selling an article for Rs 96 finds that his loss per cent is one — fourth of the amount of rupees that he paid for the article. What can be the cost price?
    a) Only Rs160
    b) Only Rs 240
    c) Either Rs 160 or Rs 240
    d) Neither Rs 160 nor Rs 240

33. A train of length 150 m takes 10 s to cross another train 100 m long coming from the opposite direction. If the speed of first train is 30 km/h. What is the speed of second train?
    a) 72 km/h
    b) 60 km/h
    c) 54 km/h
    d) 48 km/h

34. Two trains each 200 m long move towards each other on parallel lines with velocities 20 km/h and 30 km/h, respectively. What is the time that elapses when they first meet until they have cleared each other?
    a) 20 s
    b) 24.8 s
    c) 28.8 s
    d) 30 s

35. A man cycles with a speed of 10 km/h and reaches his office at 1 p.m. However, when he cycles with a speed of 15 km/h, he reaches his office at 11 am. At what speed should he cycle, so that he reaches his office at 12 noon?
    a) 12.5 km/h
    b) 12 km/h
    c) 13 km/h
    d) 13.5 km/h

36. Two cars A and B start simultaneously from a certain place at the speed of 30 km/h and 45 km/hr, respectively. The car B reaches the destination 2 h earlier than A. What is the

distance between the starting point and destination?

a) 90 km
b) 180 km
c) 270 km
d) 360 km

37. With a uniform speed, a car covers a distance in 8 hours. Had the speed been increased by 4 km/hr, the same distance could have been covered in 7 hours and 30 minutes. What is the distance covered?

a) 420 km
b) 480 km
c) 520 km
d) 640 km

38. A and B can do a piece of work in 8 days, B and C can do the same work in 12 days. If A, B and C can complete the same work in 6 days, in how many days can A and C complete the same work?

a) 8 days
b) 10 days
c) 12 days
d) 16 days

39. A garrison of 'n' men had enough food to last for 30 days. After 10 days, 50 more men joined them. If the food now lasted for 16 days, what is the value of n?

a) 200
b) 240
c) 280
d) 320

40. A can finish a work in 15 days, B in 20 days and C in 25 days. All these three worked together and earned Rs 4700. The share of C is

a) Rs 1200
b) Rs 1500
c) Rs 1800
d) Rs 2000

41. A can do a piece of work in 'x' days and B can do the same work 3x days, To finish the work together they take 12 days. What is the value of 'x'

a) 8
b) 10
c) 12
d) 16

42. If ($x^3 + 5x^2 + 10k$) leaves remainder −2x when divided by ($x^2 + 2$), then what is the value of k?

a) −2
b) −1
c) 1
d) 2

43. What should be subtracted from $27x^3 − 9x^2 − 6x − 5$ to make it exactly divisible by ($3x − 1$)?

a) −5
b) −7
c) 5
d) 7

44. If u, v and w are real numbers such that $u^3 − 8v^3 − 27w^3 = 18uvw$, then which one of the following is correct?

a) u − v + w = 0
b) u = −v = −w
c) u − 2v = 3w
d) u + 2v = −3w

45. AB is a straight line. C is a point whose distance from AB is 3cm. What is the number of points which are at a distance of 1cm from AB and 5cm from C?

a) 1
b) 2
c) 3
d) 4

46. What is the remainder when $x^5 − 5x^2 + 125$ is divided by x + 5?

a) 0
b) 125
c) −3125
d) 3125

47. Which one of the following is a null set?

a) A = {x is a real number: x > 1 and x < 1}
b) B = {x: x + 3 = 3}
c) C = {f}
d) D = {x is a real number: x^3 1 and x £ 1}

48. If $3\sin\theta + 4\cos\theta = 5,$ then what is $3\cos\theta - 4\sin\theta$ equal to?

a) 0
b) 3
c) 4
d) 5

49. Assertion a): tan 50° > 1.
Reason (R): tan θ > 1 for 0° < θ < 90°.

a) A and R are correct and R is correct explanation of A.
b) A and R are correct but R is not correct explanation of A.
c) A is true but R is false.
d) A is true but R is false.

50. If $x + y = 90^0,$ then what is $\sqrt{\cos x \cos ecy - \cos x \sin y}$ equal to?

a) $\cos x$
b) $\sin x$
c) $\sqrt{\cos x}$
d) $\sqrt{\sin x}$

51. If the given figure, BC = 15 cm and $\sin B = \dfrac{4}{5}.$ What is the value of AB?

a) 25 cm
b) 20 cm
c) 5 cm
d) 4 cm

52. If $x + y = 90^0$ and $\sin x : \sin y = \sqrt{3} : 1,$ then what is $x : y$ equal to?

a) 1 : 1
b) 1 : 2
c) 2 : 1
d) 3 : 2

53. Consider the following:

I. $\dfrac{\cos^2\theta - \sin^2\theta}{\cos^2\theta + \sin^2\theta} = \cos^2\theta(1+\tan\theta)(1-\tan\theta)$

II. $\dfrac{1+\sin\theta}{1-\sin\theta} = (\tan\theta + \sec\theta)^2$

Which of the statements given above is/are correct?

a) Only I
b) Only II
c) Both I and II
d) Neither I nor II

54. If $0 < \theta < \phi < 90^0$, then which one of the following is correct?
    a) $(\sin\theta + \cos\theta)^2 > 2$
    b) $(\sin^2\theta + \cos^2\phi) \leq 2$
    c) $(\sin^2\theta + \cos^2\phi) < 2$
    d) $(\sin^2\theta + \cos^2\phi) > 2$

55. If ABC is a right-angled triangle at C and having u units, v units and w units as the lengths of its sides opposite to be vertices A, B and C respectively, then what is tan A + tan B equal to?
    a) $\dfrac{u^2}{uw}$
    b) 1
    c) $u + v$
    d) $\dfrac{w^2}{uv}$

56. If $\sin 2\theta = \cos(\theta - 2^0)$, where 3θ and $(\theta - 2^0)$ are acute angles, what is the value of θ?
    a) 22^0
    b) 23^0
    c) 24^0
    d) 25^0

57. If $\dfrac{\sin\theta}{\cos\theta} + \dfrac{\cos\theta}{\sin\theta} = 2$ with $0 < \theta < 90^0$, then what is θ equal to?
    a) 30^0
    b) 45^0
    c) 60^0
    d) 75^0

58. Consider the following:
    I. $\dfrac{\cot 30^0 + 1}{\cot 30^0 - 1} = 2(\cot 30^0 + 1)$
    II. $2\sin 45^0 \cos 45^0 - \tan 45^0 \cot 45^0 = 0$

59. A ladder 34 m long is placed in a lane so as to reach window 30 m high and on turning the ladder to the other side of the lane and keeping is foot at the same place, reaches a point 16 m height. What is the breadth of the lane?
    a) 18 m
    b) 40 m
    c) 46 m
    d) 50 m

60. What is the angle of elevation of the Sum when the shadow of a pole is root3 times the length of the pole?
    a) 30^0
    b) 45^0
    c) 60^0
    d) None of these

61. The minute hand of a clock is 14 cm long. How much distance does the end of the minute hand travel in 15 min?
    a) 11 cm
    b) 22 cm
    c) 33 cm
    d) 44 cm

62. A wheel of a bicycle has inner diameter 50 cm and thickness 10 cm. What is the speed of the bicycle, if it makes 10 revolutions in 5 s?
    a) 5.5 m/s
    b) 4.4 m/s
    c) 3.3 m/s
    d) 2.2 m/s

63. A wall is of the form of a trapezium with height 4 m and parallel sides being 3 m and 5 m. What is the cost of painting the wall, if the rate of painting is Rs. 25 per sq m?
    a) Rs 240
    b) Rs 400
    c) Rs 480
    d) Rs 800

64. If the circumference of a circle is equal to the perimeter of square, then which one of the following is correct?
    a) Area of circle = Area of square
    b) Area of circle ³ Area of square
    c) Area of circle > Area of square
    d) Area of circle < Area of square

65. How many 200 mm lengths can be cut from 10 m of ribbon?
    a) 50
    b) 40
    c) 30
    d) 20

66. The area of a rectangle lies between 40 cm² and 45 cm². If one of the sides is 5 cm, then its diagonal lies between
    a) 8 cm and 10 cm
    b) 9 cm and 11 cm
    c) 10 cm and 12 cm
    d) 11 cm and 13 cm

67. What is the number of spherical balls of 2.5 mm diameter that can be obtained by melting a semi-circular disc of 8 cm diameter and 2 cm thickness?
    a) 6144
    b) 3072
    c) 1536
    d) 768

68. A container is in the form of a right circular cylinder surmounted by a hemisphere of the same radius 15 cm as the cylinder. If the volume of the container is 32400p cm3, then the height h of the container satisfies which one of the following?
    a) 135 cm < h < 150 cm
    b) 140 cm < h < 147 cm
    c) 145 cm < h < 148 cm
    d) 139 cm < h < 145 cm

69. A field is 125 m long and 15 m wide. A tank 10m × 7.5m × 6m was dug in it and the Earth thus dug out was spread equally on the remaining field. The level of the field thus raised is equal to which one of the following?
    a) 15 cm
    b) 20 cm
    c) 25 cm
    d) 30 cm

70. A bucket which is in the form of a frustum of a cone, has radii 3 and 5 unit and vertical height 6 unit. How much water can the bucket hold?
    a) 33p cu unit
    b) 45p cu unit
    c) 48p cu unit
    d) None of these

71. The volume of a cone is equal to that of a sphere. If the diameter of base of cone is equal to the

diameter of the sphere, then what is the ratio of height of cone to the diameter of the sphere?

a) 2:1   b) 1:2

c) 3:1   d) 4:1

72. The volume of a sphere is 8 times that of another sphere. What is the ratio of their surface areas?

a) 8:1   b) 4:1

c) 2:1   d) 4:3

73. A cylindrical vessel of height 10 cm has base radius 60 cm. If d is the diameter of a spherical vessel of equal volume, then what is d equal to?

a) 30 cm   b) 60 cm

c) 90 cm   d) 120 cm

74. The curved surface area of a right circular cone of radius 14 cm is 440 sq cm. What is the slant height of the cone?

a) 10 cm   b) 11 cm

c) 12 cm   d) 13 cm

75. The diameter of base of a right circular cone is 7 cm and slant height is 10 cm, then what is its lateral surface area?

a) 110 sq cm   b) 100 sq cm

c) 70 sq cm   d) 49 sq cm

76. A solid spherical ball of iron of radius 4 cm is melted to form spheres of radius 2 cm each. The number of spheres, so formed is

a) 8   b) 9

c) 10   d) 16

77. For a plot of land of 100 m × 80 m, the length to be raised by spreading the earth from stack of a rectangular base 10 m × 8 m and vertical section being a trapezium of height 2 m. The top of the stack is 8 m × 5 m. How many centimetres can the level raised?

a) 3 cm   b) 2.5 m

c) 2 cm   d) 1.5 cm 132

78. Consider the following statements:

1. The volume of the cone generated when the triangle is made to revolve about its longer leg is same as the volume of the cone generated when the triangle is made to revolve about its shorter leg.

2. The sum of the volume of the cone generated when the triangle is made to revolve about its longer leg and the volume of the cone generated when the triangle is made to revolve about its shorter leg is equal to the volume of the double cone generated when the triangle is made to revolve about its hypotenuse.

Which of the above statements is/are correct?

a) only 1   b) only 2

c) Both 1 or 2   d) Neither 1 or 2

79. A rectangular paper of 44 cm long and 6 cm wide is rolled to form a cylinder of height equal to width of the paper. The radius of the base of the cylinder so rolled is

a) 3.5 cm   b) 5 cm

c) 7 cm   d) 14 cm

80. If a point P moves such that its distance from two given points A and B are equal. Then, what is the locus of the point P?

a) A straight line which is the right bisector of AB

b) A circle with centre at B

c) A straight line passing through A and B.

d) A straight line passing through either A or B

81. Three lines intersect each other in pairs. What is the number of angles so formed?

a) 3   b) 6

c) 9   d) 12

82. At 8: 30, the hour hand and the minute hand of a clock form an angle of 4. 2 cm, DE = 10 cm, EF = 8 cm and FD = 8.4 cm. If AL is perpendicular to BC and DM is perpendicular to EF, then what is the ratio of AL to DM?

a) 80°   b) 75°

c) 70°   d) 60°

83. Assertion a) Triangles on the same base and between the same parallel lines are equal in area. Reason (R) The distance between two parallel lines is same everywhere.

a) Both A and R individually true and R is the correct explanation of A

b) Both A and R are individually true but R is not the correct explanation of A

c) A is true but R is false

d) A is false but R is true

84. If two corresponding sides of two similar triangles are in the ratio 9: 4, then what is the ratio of their areas?

a) 9: 4   b) 3: 2

c) 81: 16   d) 27: 8

85. The lengths of three line segments (in cm) are given in each of the four cases. Which one of the following cases is not suitable to be the three sides of a triangle?

a) 2, 3, 4   b) 2, 3, 5

c) 2, 4, 5   d) 3, 4, 5

86. Let ABC is triangle right angled at B. If AB = 6 cm and BC = 8 cm, then what is the length of the circum radius of the triangle ABC?

a) 10 cm   b) 7 cm

c) 6 cm   d) 5 cm

87. Two sides of a parallelogram are 10 cm and 15 cm. If the altitude corresponding to the side of

length 15 cm is 5 cm, then what is the altitude to the side of length 10 cm?
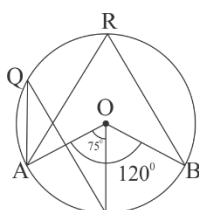
a) 5 cm   b) 7.5 cm
c) 10 cm   d) 15 cm

88. A quadrilateral ABCD is inscribed in a circle. If AB is parallel to CD and AC = BD, then the quadrilateral must be a

a) parallelogram   b) rhombus
c) trapezium   d) None of these

89. AD is the diameter of a circle and AB is a chord. If AD = 34 cm, AB = 30 cm, the distance of AB from the centre of the circle is
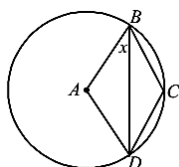
a) 17 cm   b) 15 cm
c) 13 cm   d) 8 cm

90.

In the figure given above, if $\angle AOP = 75^0$ and $\angle AOB = 120^0$, then what is the value of $\angle AQP$?

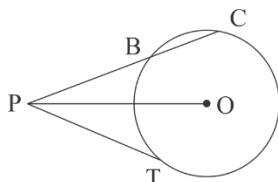a) 45^0 b) 37.5^0
c) 30^0 d) 22.5^0

91.

In the figure given below, A is the centre of the circle and AB = BC = CD. What is the value of x ?

a) 20°   b) 1 22 2°
c) 25°   d) None of these

92.

In the figure given above, PT is a tangent to a circle of radius 6 cm. If P is at a distance of 10 cm from the centre O and PB = 5cm, then what is the length of the chord BC?

a) 7.8 cm   b) 8 cm
c) 8.4 cm   d) 9 cm

93. Let PAB be a secant to a circle intersecting at points A and B and PC is a tangent. Which one of the following is correct?

a) The area of rectangle with PA, PB as sides is equal to the area of square with PC as sides

b) The area of rectangle with PA, PC as sides is equal to the area of square with PB as sides

c) The area of rectangular with PC, PB as sides is equal to the area of square with PA as side

d) The perimeter of rectangle with PA, PB as sides is equal to the perimeter of square with PC as side

94. Let C be a circle. A point P moves such that the tangents from P to C include an angle of 60°. What is the locus of P?

a) Straight line
b) A circle concentric with C
c) A circle touching C
d) A circle intersecting C at two points

95. Consider the following statements

I. The tangent of a circle is a line that meets the circle in one and only one point.

II. The tangent of a circle at the end point of the diameter is perpendicular to the diameter.

Which of the above statements is/are correct?

a) Only I   b) Only II
c) Both I and II   d) Neither I nor II

96. What type of classification is needed to enumerate the female population of India?

a) Geographical   b) Chronological
c) Qualitative   d) Quantitative

97. Which one of the following represents statistical data?

a) The names of all owners of shops located in a shopping complex

b) A list giving the names of all states of India

c) A list of all European countries and their respective capital cities

d) The volume of a rainfall in certain geographical area, recorded every month for 24 consecutive months

98. DIRECTIONS: Read the following information carefully to answer the questions that follow.

The average age of 6 persons living in a house is 23.5 years. Three of them are majors and their average age is 42 years. The difference in ages of the three minor children is same.

What is the mean of the ages of minor children?

a) 3 years   b) 4 years
c) 5 years   d) 6 years

99. Which one among the following statements is correct?

a) Simple bar diagrams are those diagrams which show two characteristics of the data

b) In pie diagrams all the items are converted into angles

c) A bar diagram is one in which data are shown in terms of bars

d) Bar diagrams present data through length and breadth

100. Which of the following is/are correctly matched?

I. Weight of a person: Continuous variable.

II. Educational qualification of the person: Attribute

Select the correct answer using the codes given below.

a) Only I
b) Only II
c) Both I and II
d) Neither I nor II

ANSWER KEY

1.c	21.c	41.d	61.b	81.d
2.c	22.a	42.c	62.b	82.b
3.c	23.a	43.b	63.b	83.a
4.c	24.c	44.c	64.c	84.c
5.a	25.a	45.d	65.a	85.a
6.c	26.d	46.c	66.b	86.d
7.d	27.c	47.a	67.d	87.b
8.d	28.b	48.a	68.a	88.c
9.c	29.c	49.c	69.c	89.d
10.d	30.b	50.b	70.d	90.b
11.d	31.a	51.a	71.a	91.d
12.a	32.c	52.c	72.b	92.a
13.a	33.b	53.c	73.b	93.a
14.c	34.c	54.c	74.a	94.b
15.a	35.b	55.d	75.a	95.c
16.c	36.b	56.b	76.a	96.d
17.a	37.b	57.b	77.d	97.d
18.b	38.a	58.c	78.b	98.c
19.c	39.a	59.c	79.c	99.a
20.b	40.a	60.a	80.a	100.a