CDS-II 2017

Elementary Maths Question Paper

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1. What is the value of $\alpha(\alpha \neq 0)$ for which $x^2 - 5x + \alpha$ and $x^2 - 7x + 2\alpha$ have a common factor?
   A. 6
   B. 4
   C. 3
   D. 2

2. How many numbers from 1 to 1000 are divisible by 2, 3, 4 and 5?
   A. 16
   B. 17
   C. 32
   D. None of the above

3. What are the factors of $x^3 + 4x^2 - 11x - 30$?
   A. $(x - 2), (x + 3)$ and $(x + 5)$
   B. $(x + 2), (x + 3)$ and $(x - 5)$
   C. $(x + 2), (x - 3)$ and $(x + 5)$
   D. $(x + 2), (x - 3)$ and $(x - 5)$

4. If $x = 111\ldots\ldots1$ (20 digits), $y = 333\ldots.3$ (10 digits) and $z = 222\ldots\ldots.2$ (10 digits), then what is $\frac{x - y^2}{z}$ equal to?
   A. $\frac{1}{2}$
   B. 1
   C. 2
   D. 3

5. What is the positive value of m for which the roots of the equation $12x^2 + mx + 5 = 0$ are in the ratio 3:2?
   A. $5\sqrt{10}$
   B. $\frac{5\sqrt{10}}{12}$
   C. $\frac{5}{12}$
   D. $\frac{12}{5}$

6. Let f(x) and g(x) be two polynomials (with real coefficients) having degrees 3 and 4 respectively. What is the degree of f(x)g(x)?
   A. 12
   B. 7
   C. 4
   D. 3

7. $5x^3 + 5x^2 - 6x + 9$ is divided by $(x + 3)$, then the remainder is
   A. 135
   B. -135
   C. 63
   D. -63

8. The product of two non-zero expressions is $(x + y + z)p^3$. If their HCF is p^2, then their LCM is
   A. $(x + y + z)$
   B. $(x + y + z)p^2$
   C. $(x + y + z)p^5$
   D. $(x + y + z)p$

9. If the points P and Q represent the real numbers $0.8\bar{3}$ and $0.6\bar{2}$ on the number line, then the distance between P and Q is
   A. $\frac{21}{90}$
   B. $\frac{19}{90}$
   C. $\frac{21}{100}$
   D. $\frac{56}{90}$

10. Sudhir purchased a chair with three consecutive discounts of 20%, 12.5% and 5%. The actual deduction will be
    A. 33.5%
    B. 30%
    C. 32%
    D. 35%

11. A fruit seller has a certain number of mangoes of which 5% are rotten. He sells 75% of the remainder and he is left with 95 mangoes. How many mangoes did he have originally?
    A. 500
    B. 450
    C. 400
    D. 350

12. If a train crosses a km-stone in 12 seconds, how long will it take to cross 91 km-stones completely if its speed is 60 km/hr?
    A. 1 hr 30 min
    B. 1 hr 30 min 12 sec
    C. 1 hr 51 min
    D. 1 hr 1 min 3 sec

13. In a 100 m race, A runs at 6 km/hr. If A gives B a start of 8 m and still beats him by 9 seconds, what is the speed of B?
    A. 4.6 km/hr
    B. 4.8 km/hr
    C. 5.2 km/hr
    D. 5.4 km/hr

14. The quotient of $8x^3 - y^3$ when divided by $2xy + 4x^2 + y^2$ is
    A. $2x + y$
    B. $x + 2y$
    C. $2x - y$
    D. $4x - y$

15. If $(x + 2)$ is a common factor of $x^2 + ax + b$ and $x^2 + bx + a$, then the ratio $a : b$ is equal to
    A. 1
    B. 2
    C. 3
    D. 4

16. Let
    $f(x) = a_0 x^n + a_1 x^{n-1} + a_2 x^{n-2} + \ldots + a_{n-1} x + a_n$,
    where $a_0, a_1, a_2, \ldots, a_n$ are real numbers. If $f(x)$ is divided by $(ax - b)$, then the remainder is
    A. $f\left(\frac{b}{a}\right)$
    B. $f\left(-\frac{b}{a}\right)$
    C. $f\left(\frac{a}{b}\right)$
    D. $f\left(-\frac{a}{b}\right)$

17. Consider the following numbers:
    1. 2222
    B. 11664
    C. 343343
    D. 220347
    Which of the above are not perfect squares?
    A. 1, 2 and 3
    B. 1, 2 and 4
    C. 2, 3 and 4
    D. 1, 3 and 4

18. The product of the polynomials $(x + 2), (x − 2), (x^3 − 2x^2 + 4x − 8)$ and $(x^3 + 2x^2 + 4x + 8)$ is
A. $x^8 − 256$
B. $(x^4 − 16)^2$
C. $(x^4 + 16)^2$
D. $(x^2 − 4)^2$

19. The factors of $x(x + 2)(x + 3)(x + 5) − 72$ are
A. $x, (x + 3), (x + 4)$ and $(x − 6)$
B. $(x − 1), (x + 6)$ and $(x^2 − 2x − 12)$
C. $(x − 1), (x + 6)$ and $(x^2 + 5x + 12)$
D. $(x + 1), (x − 6)$ and $(x^2 − 5x − 12)$

20. If the HCF of polynomials $f(x) = (x − 1)(x^2 + 3x + a)$ and $g(x) = (x + 2)(x^2 + 2x + b)$ is $(x^2 + x − 2)$, then what are the values of a and b respectively?
A. 2, 2
B. 2, -3
C. -1, -3
D. -2, -1

21. a, b, c, d are non-zero integers such that (ab) divides (cd). If a and c are coprime, then which one of the following is correct?
A. a is a factor of c
B. a is a factor of b
C. a is a factor of d
D. d is a factor of a

22. If the roots of the equation $a(b − c)x^2 + b(c − a)x + c(a − b) = 0$ are equal, then which one of the following is correct?
A. $2b = a + c$
B. $b^2 = ac$
C. $\frac{2}{b} = \frac{1}{a} + \frac{1}{c}$
D. $\frac{1}{b} = \frac{1}{a} + \frac{1}{c}$

23. The non-zero solution of the equation $\frac{a − x^2}{bx} − \frac{b − x}{c} = \frac{c − x}{b} − \frac{b − x^2}{cx}$, where $b \neq 0, c \neq 0$ is
A. $\frac{b^2 + ac}{b^2 + c^2}$
B. $\frac{b^2 − ac}{b^2 − c^2}$
C. $\frac{b^2 − ac}{b^2 + c^2}$
D. $\frac{b^2 + ac}{b^2 − c^2}$

24. If k is an integer, then $x^2 + 7x − 14\left(k^2 − \frac{7}{8}\right) = 0$ has
A. Both integral roots
B. At least one integral root
C. No integral root
D. Both positive integral roots

25. How many numbers between 500 and 1000 are divisible by 13?
A. 36
B. 37
C. 38
D. 39

26. To maintain 8 cows for 60 days, a milkman has to spend ₹ 6,400. To maintain 5 cows for n days, he has to spend ₹4,800. What is the value of n?
A. 46 days
B. 50 days
C. 58 days
D. 72 days

27. A student has to secure 40% of marks to pass an examination. He gets only 45 marks and fails by 5 marks. The maximum marks are
A. 120
B. 125
C. 130
D. 150

28. What is the value of u in the system of equations $3(2u + v) = 7vu, 3(u + 3v) = 11uv$?
A. 0
B. $\frac{1}{4}$
C. $\frac{1}{2}$
D. 1

29. Five years ago, Ram was three times as old as Shyam. Four years from now, Ram will be only twice as old as Shyam. What is the present age of Ram?
A. 30 years
B. 32 years
C. 36 years
D. 40 years

30. Ram buys 4 chairs and 9 stools for ₹1,340. If he sells chairs at 10% profit and stools at 20% profit, he earns a total profit of ₹188. How much money did he have to pay for the chairs?
A. ₹200
B. ₹400
C. ₹800
D. ₹1,600

31. Which one of the following is a correct statement?
A. {x : x + 5 = 5} = ϕ
B. {x : x + 5 = 5} = {0}
C. {x : x + 5 = 5} = 0
D. {x : x + 5 = 5} = {ϕ}

32. If $ab + bc + ca = 0$, then what is the value of $\frac{a^2}{a^2 − bc} + \frac{b^2}{b^2 − ca} + \frac{c^2}{c^2 − ab}$?
A. 3
B. 0
C. 1
D. -1

33. In an examination, 35% students failed in Hindi, 45% students failed in English and 20% students failed in both the subjects. What is the percentage of students passing in both the subjects?
A. 0
B. 20
C. 30
D. 40

34. What is $\frac{(x − y)(y − z)(z − x)}{(x − y)^3 + (y − z)^3 + (z − x)^3}$ equal to?
A. $−\frac{1}{3}$
B. $\frac{1}{3}$
C. 3
D. -3

35. The value of $\sqrt{1 + \sqrt{1 + \sqrt{1 + \ldots}}}$
    A. Equals to 1
    B. Lies between 0 and 1
    C. Lies between 1 and 2
    D. Is greater than 2

36. If $\log_{10} 8 = 0.9031$, then what is the value of $\log_{10} 8000 + \log_{10} 600$?
    A. 4.6813   B. 5.5813
    C. 1.5813   D. 6.6813

37. 30 men can complete a job in 40 days. However, after 24 days some men out of the assigned 30 left the job. The remaining people took another 40 days to complete the job. The number of men who left the job is
    A. 24   B. 18
    C. 12   D. 6

38. 4 goats or 6 sheep can graze a field in 50 days. 2 goats and 3 sheep will graze it in
    A. 200 days   B. 150 days
    C. 100 days   D. 50 days

39. A tap can fill a tub in 10 hours. After opening the tap for 5 hours it was found that a small outlet at the bottom of the tub was open and water was leaking through it. It was then immediately closed. It took 7 hours to fill the tub after closing the outlet. What time will be taken by the outlet to empty the full tub of water?
    A. 35 hours   B. 25 hours
    C. 20 hours   D. 17 hours

40. A boy went to his school at a speed of 12 km/hr and returned to his house at a speed of 8 km/hr. If he has taken 50 minutes for the whole journey, what was the total distance walked?
    A. 4 km   B. 8 km
    C. 16 km   D. 20 km

41. If 78 is divided into 3 parts which are proportional to $1, \frac{1}{3}, \frac{1}{6}$, then the middle part is
    A. $\frac{28}{3}$ B. 13
    C. $\frac{52}{3}$ D. $\frac{55}{3}$

42. There are 350 boys in the first three standards. The ratio of the number of boys in first and second standards is 2:3, while that of boys in second and third standards is 4:5. What is the total number of boys in first and third standards?
    A. 302   B. 280
    C. 242   D. 230

43. The difference between the compound interest (compounded annually) and simple interest on a sum of money deposited for 2 years at 5% per annum is ₹15. What is the sum of money deposited?
    A. ₹ 6,000   B. ₹ 4,800
    C. ₹ 3,600   D. ₹ 2,400

44. When prices rise by 12%, if the expenditure is to be the same, what is the percentage of consumption to be reduced?
    A. $16\frac{2}{3}\%$ B. $10\frac{2}{7}\%$
    C. $16\frac{3}{5}\%$ D. $10\frac{5}{7}\%$

45. A man rows down a river 18 km in 4 hours with the stream and returns in 10 hours. Consider the following statements:
    1. The speed of the man against the stream is 1.8 km/hr.
    2. The speed of the man in still water is 3.15 km/hr
    Which of the above statements are correct?
    A. 1 and 2 only   B. 2 and 3 only
    C. 1 and 3 only   D. 1, 2 and 3

46. If a triangle has sides 5, 13 and 12 units and θ is the acute angle of the triangle, then what is value of $(\sin\theta + \cos\theta)$?
    A. $\frac{5}{13}$ B. $\frac{7}{13}$
    C. $\frac{12}{13}$ D. $\frac{17}{13}$

47. If $0 < x < \frac{\pi}{2}$, then $(\sin x + \cos x)$ is
    A. >2   B. <2
    C. ≥2   D. ≤2

48. If $\sin\theta = \frac{m^2 - n^2}{m^2 + n^2}$ and $0 < \theta < \frac{\pi}{2}$, then what is the value of $\cos\theta$?
    A. $\frac{2mn}{m^2 + n^2}$ B. $\frac{2mn}{m^2 - n^2}$
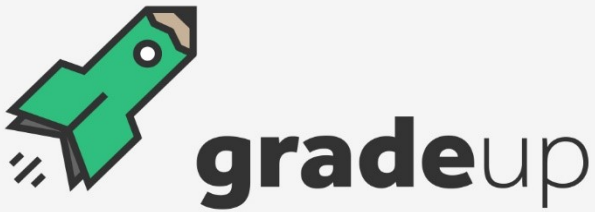   C. $\frac{m^2 + n^2}{2mn}$ D. $\frac{m^2 - n^2}{2mn}$

49. If angle A of triangle ABC is 30° and circum-radius of the triangle is 10 cm, then what is the length of side BC?
    A. 5 cm
    B. 10 cm
    C. $5\sqrt{3}$ cm
    D. $10\sqrt{3}$ cm

50. If $A = \frac{\sin 45° - \sin 30°}{\cos 45° + \cos 60°}$ and $B = \frac{\sec 45° - \tan 45°}{cosec\ 45° + \cot 45°}$, then which one of the following is correct?
    A. A = B
    B. A > B > 0
    C. A < B
    D. B < A < 0

51. If θ measured in radians is the angle between the hour hand and the minute hand of a clock when the time is 4 : 36 pm, then which one of the following is correct?
    A. $\frac{3\pi}{5} < \theta < \frac{4\pi}{5}$
    B. $\frac{2\pi}{5} < \theta < \frac{3\pi}{5}$
    C. $\frac{\pi}{5} \leq \theta \leq \frac{2\pi}{5}$
    D. $\frac{7\pi}{15} \leq \theta \leq \frac{8\pi}{15}$

52. Consider the following statements:
    1. If $45° < \theta < 60°$, then $\sec^2 \theta + cosec^2 \theta = \alpha^2$ for some real number $\alpha > 1$.
    2. If $0° < \theta < 45°$, then $\frac{1 + \cos \theta}{1 - \cos \theta} = x^2$ for some real number $x > 2$.
    3. If $0° < \theta < 45°$, then $\frac{\cos \theta}{1 - \tan \theta} + \frac{\sin \theta}{1 - \cot \theta} \geq 2$
    What is the number of true statements?
    A. Zero
    B. One
    C. Two
    D. Three

53. Let AB represent a building of height h metre with A being its top, B being its bottom. Let A'B' represent a tower of height (h+x) metre (x>0) with A' being its top and B' being its bottom. Let BB' = d metre. Let the angle of elevation of A' as seen from A be 45°.
    Consider the following statements:
    Statement I: h + x > d
    Statement II: The angle of depression of B as seen from A' is less than 45°.
    Which one of the following is correct in respect of the above statements?
    A. Both Statement I and Statement II are true and Statement II is the correct explanation of Statement I
    B. Both Statement I and Statement II are true but Statement II is not the correct explanation of Statement I
    C. Statement I is true but Statement II is false
    D. Statement I is false but Statement II is true

54. A man, standing at a point X on the bank XY of a river that cannot be crossed, observes a tower to be N α^0 E on the opposite parallel bank. He then walks 200 m along the bank to the point Y towards East, and finds the tower to be N β^0 W. From these observations, the breadth of the river will be
    (Given that $\tan \alpha^0 = 2$ and $\tan \beta^0 = 0.5$)
    A. 60 m
    B. 70 m
    C. 80 m
    D. 90 m

55. The value of $\frac{\sin 1°}{\sin 1^c}$ where 1^c represents 1 radian is
    A. Equal to 1
    B. Less than 1
    C. Greater than 1 but less than 2
    D. Greater than 2

56. The diameters of two given circles are in the ratio 12:5 and the sum of their areas is equal to the area of a circle of diameter 65 cm. What are their radii?
    A. 12 cm and 5 cm
    B. 24 cm and 10 cm
    C. 60 cm and 25 cm
    D. 30 cm and 12.5 cm

57. A hollow cube is formed by joining six identical squares. A rectangular cello tape of length 4 cm and breadth 0.5 cm is used for joining each pair of edges. What is the total area of cello tape used?
    A. 12 square cm
    B. 24 square cm
    C. 36 square cm
    D. 48 square cm

58. Two straight lines AB and AC include an angle. A circle is drawn in this angle which touches both these lines. One more circle is drawn which touches both these lines as well as the previous circle. If the area of the bigger circle is 9 times the area of the smaller circle, then what must be the angle A?
    A. 45°
    B. 60°
    C. 75°
    D. 90°

59. An isosceles triangle is drawn outside on one of the sides of a square as base in such a way that the perimeter of the complete figure is $\frac{7}{6}$ times the perimeter of the original square. What is the ratio of area of the triangle to the area of the original square?
    A. 1 : 1   B. 2 : 3
    C. 1 : 2   D. 1 : 3

60. What is the area of the triangle whose sides are 51 cm, 37 cm, and 20 cm?
    A. 300 square cm   B. 305 square cm
    C. 306 square cm   D. 307 square cm

61. Segment QR of length r is a tangent at Q to a circle of radius r with centre at P. What is the area of the part of the triangle PQR, which is outside the circular region?
    A. $\frac{\pi r^2}{16}$ B. $\frac{r^2}{2} - \frac{\pi r^2}{8}$
    C. $\frac{r^2}{2} - \frac{\pi r^2}{16}$ D. $\frac{r^2}{4} - \frac{\pi r^2}{8}$

62. In a triangle ABC, AD is perpendicular on BC. If $\angle BAC = 90°$, AB = c, BC = a, CA = b and AD = p, then which one of the following is correct?
    A. $p = abc$ B. $p^2 = bc$
    C. $p = \frac{bc}{a}$ D. $p = \frac{ab}{c}$

63. AB and CD are parallel chords of a circle 3 cm apart. If AB = 4 cm, CD = 10 cm, then what is the radius of the circle?
    A. 7 cm   B. $\sqrt{19}$ cm
    C. $\sqrt{29}$ cm   D. 14 cm

64. The diagonals of a cyclic quadrilateral ABCD intersect at P and the area of the triangle APB is 24 square cm. If AB = 8 cm and CD = 5 cm, then what is the area of the triangle CPD?
    A. 24 square cm   B. 25 square cm
    C. 12.5 square cm D. 9.375 square cm

65. In an equilateral triangle ABC, BD is drawn perpendicular to AC. What is BD^2 equal to?
    A. AD^2 B. $2AD^2$
    C. $3AD^2$ D. $4AD^2$

66. The distance between the centres of two circles having radii 9 cm and 4 cm is 13 cm. What is the length of the direct common tangent of these circles?
    A. 12 cm   B. 11 cm
    C. 10 cm   D. 9.5 cm

67. If PL, QM and RN are the altitudes of triangle PQR whose orthocentre is O, then Q is the orthocentre of the triangle
    A. OPQ   B. OQR
    C. PLR   D. OPR

68. In a triangle ABC, $\angle C = 90°$ and CD is the perpendicular from C to AB.
    If $(CD)^{-2} = (BC)^{-2} + (CA)^{-2}$, then which one of the following is correct?
    A. BC.CD = AB.CA
    B. AB.BC = CD.CA
    C. $CA^2 + CB^2 = 2(AD^2 + CD^2)$
    D. AB.CD = BC.CA

69. If a point O in the interior of a rectangle ABCD is joined with each of the vertices A, B, C and D, then $OB^2 + OD^2$ will be equal to
    A. $2OC^2 + OA^2$ B. $OC^2 - OA^2$
    C. $OC^2 + OA^2$ D. $OC^2 + 2OA^2$

70. A cylinder of height 2x is circumscribed by a sphere of radius 2x such that the circular ends of the cylinder are two small circles on the sphere. What is the ratio of the curved surface are of the cylinder to the surface area of the sphere?
    A. $\sqrt{3} : 4$ B. $\sqrt{3} : 3$
    C. $\sqrt{3} : 2$ D. $\sqrt{3} : 1$

71. A cylindrical vessel 60 cm in diameter is partially filled with water. A sphere 30 cm in diameter is gently dropped into the vessel and is completely immersed. To what further height will the water in the cylinder rise?
    A. 20 cm   B. 15 cm
    C. 10 cm   D. 5 cm

72. The vertical angle of right circular cone is $\frac{\pi}{2}$ and the slant height is $\sqrt{2}$ r cm. What is the volume of the cone in cubic cm?
    A. πr^3 B. $9\pi r^3$
    C. $\frac{\pi r^3}{3}$ D. $3\pi r^3$

73. The radii of the frustum of a right circular cone are in the ratio 2 : 1. What is the ratio of the volume of the frustum of the cone to that of the whole cone?
    A. 1 : 8   B. 1 : 4
    C. 3 : 4   D. 7 : 8

74. From a solid cylinder whose height is 8 cm and of base radius 6 cm, a conical cavity of height 8 cm and of base radius 6 cm is formed by hollowing out. What is the inner surface area of the cavity?
    A. 6π square cm   B. 8π square cm
    C. 10π square cm   D. 60π square cm

75. A tent has been constructed which is in the form of a right circular cylinder surmounted by a right circular cone whose axis coincides with the axis of the cylinder. If the radius of the base of the cylinder is 50 m, the height of the cylinder is 10 m and the total height of the tent is 15 m, then what is the capacity of the tent in cubic metres?
    A. 37500π B. $\frac{87500\pi}{3}$
    C. $\frac{26500\pi}{3}$ D. 25000π

76. Two rectangular sheets of sizes 2π X 4π and π X 5π are available. A hollow right circular cylinder can be formed by joining a pair of parallel sides of any sheet. What is the maximum possible volume of the circular cylinder that can be formed this way?
    A. $4\,\pi^2$ B. $8\,\pi^2$
    C. $1.25\,\pi^2$ D. $6.25\,\pi^2$

77. In a triangle ABC, the medians AD and BE intersect at G. A line DF is drawn parallel to BE such that F is on AC. If AC = 9 cm, then what is CF equal to?
    A. 2.25 cm   B. 3 cm
    C. 4.5 cm   D. 6 cm

78. In a triangle PQR, X is a point on PR Y is a point on QR such that PR = 10 cm, RX = 4 cm, YR = 2 cm, QR = 5 cm. Which one the following is correct?
    A. XY is parallel to PQ
    B. PQ = 2XY
    C. PX = QY
    D. PQ = 3XY

79. Consider the following statements in respect of three straight lines A, B and C on a plane:
    1. If A and C are parallel and B and C are parallel; then A and B are parallel.
    2. If A is perpendicular to C and B is perpendicular to C; then A and B are parallel.
    3. If the acute angle between A and C is equal to the acute angle between B and C; then A and B are parallel.
    Which of the above statements are correct?
    A. 1, 2 and 3
    B. 1 and 2 only
    C. 1 and 3 only
    D. 2 and 3 only

80. The diagonals of a rhombus are of length 20 cm and 48 cm. What is the length of a side of the rhombus?
    A. 13 cm   B. 26 cm
    C. 36 cm   D. 39 cm

81. An arc of a circle subtends an angle π at the centre. If the length of the arc is 22 cm, then what is the radius of the circle?
    (Take $\pi = \frac{22}{7}$)
    A. 5 cm   B. 7 cm
    C. 9 cm   D. 11 cm

82. One-fifth of the area of a triangle ABC is cut off by a line DE drawn parallel to BC such that D is on AB and E is on AC. If BC = 10 cm, then what is DE equal to?
    A. $\sqrt{5}$ cm   B. $2\sqrt{5}$ cm
    C. $3\sqrt{5}$ cm   D. $4\sqrt{5}$ cm

83. There are 8 lines in a plane, no two of which are parallel. What is the maximum number of points at which they can intersect?
    A. 15
    B. 21
    C. 28
    D. None of the above

84. A closed polygon has six sides and one of its angles is 30° greater than each of the other five equal angles. What is the value of one of the equal angles?
    A. 55°   B. 115°
    C. 150°   D. 175°

85. Consider the following statements:
1. The point of intersection of the perpendicular bisectors of the sides of a triangle may lie outside the triangle.
2. The point of intersection of the perpendiculars drawn from the vertices to the opposite sides of a triangle may lie on two sides.
Which of the above statements is/are correct?
A. 1 only   B. 2 only
C. Both 1 and 2   D. Neither 1 nor 2

For the next five (05) items that follow:
In a University there are 1200 students studying four difference subjects, Mathematics, Statistics, Physics and Chemistry. 20% of the total number of students are studying Mathematics, one-fourth of the total number of students are studying Physics, 320 students are studying Statistics and remaining students are studying Chemistry. Three-fifth of the total number of students studying Chemistry are girls. 150 boys are studying Mathematics. 60% of students studying Physics are boys. 250 girls are studying Statistics.

86. What is the total number of boys studying Statistics and Physics?
A. 180   B. 240
C. 250   D. 310

87. The number of girls studying Statistics is what percent (approximate) of the total number of students studying Chemistry?
A. 58.8   B. 73.5
C. 78.7   D. 80.6

88. In which subjects is the difference between the number of boys and girls equal?
A. Mathematics and Chemistry
B. Statistics and Chemistry
C. Mathematics and Physics
D. Mathematics and Statistics

89. What is the difference between the number of boys studying Mathematics and the number of girls studying Physics?
A. 20   B. 30
C. 60   D. 80

90. What is the ratio of the total number of boys to the total number of girls?
A. 67 : 83
B. 17 : 26
C. 27 : 19
D. 189 : 179

91. Frequency density of a class is computed by the ratio
A. Class frequency to the class width
B. Class frequency to total frequency
C. Class frequency to total number of classes
D. Cumulative frequency up to that class to total frequency

92. A small company pays each of its 5 category 'C' workers ₹ 20,000, each of its 3 category 'B' workers ₹ 25,000 and a category 'A' worker ₹ 65,000. The number of workers earning less than the mean salary is
A. 8   B. 5
C. 4   D. 3

93. A man travelled 12 km at a speed of 4 km/hr and further 10 km at a speed of 5 km/hr. What was his average speed?
A. 4.4 km/hr
B. 4.5 km/hr
C. 5.0 km/hr
D. 2.5 km/hr

94. The pie diagrams on the monthly expenditure of two families A and B are drawn with radii of two circles taken in the ratio 16 : 9 to compare their expenditures.
Which one of the following is the appropriate data used for the above mentioned pie diagrams?
A. ₹ 16,000 and ₹ 9,000
B. ₹ 8,000 and ₹ 4,500
C. ₹ 25,600 and ₹ 8,100
D. ₹ 4,000 and ₹ 3,000

95. Consider the following statements:
Statement I : The value of a random variable having the highest frequency is mode.
Statement II : Mode is unique.
Which one of the following is correct in respect of the above statements?

A. Both Statement I and Statement II are true and Statement II is the correct explanation of Statement I

B. Both Statement I and Statement II are true but Statement II is not the correct explanation of Statement I

C. Statement I is true but Statement II is false

D. Statement I is false but Statement II is true

96. Which one of the following is **not** correct?

The proportion of various items in a pie diagram is proportional to the

A. Areas of slices

B. Angles of slices

C. Lengths of the curved arcs of the slices

D. Perimeters of the slices

97. The geometric mean of x and y is 6 and the geometric mean of x, y and z is also 6. Then the value of z is

A. 12   B. $\sqrt{6}$

C. 6   D. $\sqrt[3]{6}$

98. The total number of live births in a specific locality during different months of a specific year was obtained from the office of the Birth Registrar. This set of data may be called

A. Primary data   B. Secondary data

C. Recorded data   D. Countable data

99. The heights (in cm) of 5 students are 150, 165, 161, 144 and 155. What are the values of mean and median (in cm) respectively?

A. 165 and 161   B. 155 and 155

C. 160 and 155   D. 155 and 161

100. The average height of 22 students of a class is 140 cm and the average height of 28 students of another class is 152 cm. What is the average height of students of both the classes?

A. 144.32 cm   B. 145.52 cm

C. 146.72 cm   D. 147.92 cm