

**JEMAS(PG)-2023** **QB No: 3101200001**  
**Subject: Diploma in Health Statistics (DHS)**

**Duration: 90 minutes**

**No of MCQ: 100**

**Full Marks: 100**

**INSTRUCTIONS**

1. All questions are of objective type having four answer options for each.
2. **Category-1:** Carries **1** mark each and only one option is correct. In case of incorrect answer or any combination of more than one answer,  $\frac{1}{4}$  mark will be deducted.
3. Questions must be answered on OMR sheet by darkening the appropriate bubble marked A, B, C, or D.
4. Use only **Black/Blue ink ball point pen** to mark the answer by filling up of the respective bubbles completely.
5. Write Question Booklet number and your roll number carefully in the specified locations of the **OMR** sheet. Also fill appropriate bubbles.
6. Write your name (in block letter), name of the examination center and put your signature (as is appeared in Admit Card) in appropriate boxes in the **OMR sheet**.
7. The OMR sheet is liable to become invalid if there is any mistake in filling the correct bubbles for Question Booklet number/roll number or if there is any discrepancy in the name/ signature of the candidate, name of the examination center. The OMR sheet may also become invalid due to folding or putting stray marks on it or any damage to it. The consequence of such invalidation due to incorrect marking or careless handling by the candidate will be sole responsibility of candidate.
8. Candidates are not allowed to carry any written or printed material, calculator, pen, log-table, wristwatch, any communication device like mobile phones, bluetooth devices etc. inside the examination hall. Any candidate found with such prohibited items will be **reported against** and his/her candidature will be summarily cancelled.
9. Rough work must be done on the Question Booklet itself. Additional blank pages are given in the Question Booklet for rough work.
10. Hand over the OMR sheet to the invigilator before leaving the Examination Hall.
11. Candidates are allowed to take the Question Booklet after examination is over.

Signature of the Candidate: \_\_\_\_\_

(As in Admit Card)

Signature of the Invigilator: \_\_\_\_\_

1. Three numbers are chosen at random from 1 to 20. The probability that they are consecutive is :  
(A)  $1/190$ .  
(B)  $1/120$ .  
(C)  $3/190$ .  
(D)  $5/190$ .
2. Using binomial theorem, the value of  $(0.999)^3$  correct to 3 decimal places is :  
(A) 0.999.  
(B) 0.998.  
(C) 0.997.  
(D) 0.995.
3. A and B are two independent events such that  $P(A \cup B') = 0.8$  and  $P(A) = 0.3$ . The  $P(B)$  is :  
(A)  $2/7$ .  
(B)  $2/3$ .  
(C)  $2/5$ .  
(D)  $1/8$ .
4. Angle between  $y^2 = x$  and  $x^2 = y$  at the origin is :  
(A) 30 Degree.  
(B) 60 Degree.  
(C) 90 Degree.  
(D) 120 Degree.
5. If A is a square matrix then :  
(A)  $A + \text{transpose}(A)$  is symmetric.  
(B)  $A * \text{transpose}(A)$  is skew - symmetric.  
(C)  $\text{Transpose}(A) + A$  is skew-symmetric.  
(D)  $\text{Transpose}(A) * A$  is skew symmetric.
6. Five numbers are in H.P. The middle term is 1 and the ratio of the second and the fourth terms is 2:1. Then the sum of the first three terms is :  
(A)  $11/2$ .  
(B) 5.  
(C) 2.  
(D)  $14/3$ .
7. The maximum and minimum values of  $\cos^6\theta + \sin^6\theta$  are :  
(A) 1 and 0.  
(B) 1 and  $1/4$ .  
(C) 2 and 0.  
(D) 1 and  $1/2$ .
8. If  $\sin^2\theta + 3\cos\theta = 2$ , then  $\cos^3\theta + \sec^3\theta$  is :  
(A) 1.  
(B) 4.  
(C) 9.  
(D) 18.

9. Let A and B be two given events such that  $P(A) = 0.6$ ,  $P(B) = 0.2$  and  $P(A|B) = 0.5$ . Then  $P(A' | B')$  is :
- (A)  $1/10$ .
  - (B)  $3/10$ .
  - (C)  $3/8$ .
  - (D)  $6/7$ .
10. If  $P(A \cap B) = 70\%$  and  $P(B) = 85\%$ , then  $P(A|B)$  is equal to :
- (A)  $14/17$ .
  - (B)  $17/20$ .
  - (C)  $7/8$ .
  - (D)  $1/8$ .
11. Three balls are drawn from a bag containing 2 red and 5 black balls, if the random variable X represents the number of red balls drawn, then X can take values :
- (A) 0,1,2.
  - (B) 0,1,2,3.
  - (C) 2.
  - (D) 0.
12. The equation  $(3^{0.5}) \sin x + \cos x = 4$  has :
- (A) Only one solution.
  - (B) Two solutions.
  - (C) Infinitely many solutions.
  - (D) No solution.
13. The total number of tangents through the point (3, 5) that can be drawn to the ellipses  $3x^2 + 5y^2 = 32$  and  $25x^2 + 9y^2 = 450$  is :
- (A) 0.
  - (B) 2.
  - (C) 3.
  - (D) 4.
14. The median of the data: 155 160 145 149 150 147 152 144 148 is :
- (A) 155.
  - (B) 156.
  - (C) 149.
  - (D) 150.
15. The diagonals of a parallelogram :
- (A) Unequal.
  - (B) Equal.
  - (C) Bisect each other.
  - (D) Have no relation.
16. The surface area of a cube whose edge equals to 3cm is :
- (A) 44 sq.cm.
  - (B) 64 sq.cm.
  - (C) 54 sq. cm.
  - (D) 144sq.cm.

17. The angle subtended by the diameter of a semi-circle is :  
(A) 60.  
(B) 90.  
(C) 120.  
(D) 180.
18. In between any two numbers there are :  
(A) Only one rational number.  
(B) Very few rational numbers.  
(C) Infinite rational numbers.  
(D) No rational number.
19. Abscissa of a point is positive in :  
(A) I and II quadrants.  
(B) II quadrant only.  
(C) I and IV quadrants.  
(D) I quadrants only.
20. If AM of  $a$ ,  $a+3$ ,  $a+6$ ,  $a+9$  and  $a+12$  is 10, then  $a$  is equal to :  
(A) 4.  
(B) 3.  
(C) 2.  
(D) 1.
21. The least number that is divisible by all the numbers from 1 to 5 is :  
(A) 50.  
(B) 60.  
(C) 70.  
(D) 80.
22. For any given data, the mean is 45.5, and the median is 43. What is the mode?  
(A) 40.  
(B) 42.  
(C) 35.  
(D) 38.
23. A circle has a number of tangents equal to :  
(A) 1.  
(B) 2.  
(C) 3.  
(D) None of these.
24. The difference between the maximum and minimum values of the given set of observations is called :  
(A) Class mark.  
(B) Range.  
(C) Class.  
(D) None of these.

25. 30th term of the A.P: 10, 7, 4, ..., is :
- (A) 87.
  - (B) -87.
  - (C) 77.
  - (D) -77.
26. The points  $(-1, -2)$ ,  $(1, 0)$ ,  $(-1, 2)$ ,  $(-3, 0)$  form a quadrilateral of type :
- (A) Triangle.
  - (B) Square.
  - (C) Circle.
  - (D) Straight line.
27. Construction of a cumulative frequency table is useful in determining the :
- (A) Mean.
  - (B) Median.
  - (C) Mode.
  - (D) All of the above.
28. The degree of the constant polynomial is :
- (A) 1.
  - (B) 2.
  - (C) 3.
  - (D) 0.
29. A point has \_\_\_\_\_ dimension :
- (A) One.
  - (B) Two.
  - (C) Three.
  - (D) Zero.
30. If a matrix A is both symmetric and skew symmetric then matrix A is :
- (A) A scalar matrix.
  - (B) A diagonal matrix.
  - (C) A zero matrix of order  $n \times n$ .
  - (D) A rectangular matrix.
31. If matrices A and B are inverse of each other then :
- (A)  $AB = BA$ .
  - (B)  $AB = BA = I$ .
  - (C)  $AB = BA = 0$ .
  - (D)  $AB = 0, BA = I$ .
32. Individual respondents, focus groups, and panels of respondents are categorised as :
- (A) Primary Data Sources.
  - (B) Secondary Data Sources.
  - (C) Itemized Data Sources.
  - (D) Pointed Data Sources.

33. By solving the equation  $2x - (3x - 4) = 3x - 5$ , the value of  $x$  will be :  
(A)  $9/4$ .  
(B)  $1/2$ .  
(C)  $7/3$ .  
(D)  $1/3$ .
34. By solving the equation  $3:5x = 9:5$ ,  $x \neq 0$ , the value of  $x$  will be :  
(A)  $1/2$ .  
(B)  $1/3$ .  
(C)  $1/4$ .  
(D)  $3$ .
35. By solving the equation  $(3x-5)/(7x-5)=1/9$ , the value of  $x$  will be :  
(A)  $1$   
(B)  $2$ .  
(C)  $3$ .  
(D)  $4$ .
36. In how many points can two distinct lines at the most intersect?  
(A)  $0$ .  
(B)  $1$ .  
(C)  $2$ .  
(D)  $3$ .
37. Every real number is :  
(A) Rational number only.  
(B) Irrational number only.  
(C) Either rational or irrational number.  
(D) None of the above.
38. Which of the following describe the middle part of a group of numbers?  
(A) Measures of variability.  
(B) Measures of central tendency.  
(C) Measures of association.  
(D) Measures of shape.
39. The middle value of an ordered array of numbers is the :  
(A) Mean.  
(B) Median.  
(C) Mode.  
(D) Range.
40. Which of the following divides a group of data into four subgroups?  
(A) Mode.  
(B) Quartiles.  
(C) Percentiles.  
(D) Range.

41. Sum of dots when two dice are rolled is :
- (A) A discrete variable.
  - (B) A continuous variable.
  - (C) An attribute.
  - (D) A constant.
42. Census reports used as a source of data for an individual researcher is :
- (A) Primary Data Sources.
  - (B) Secondary Data Sources.
  - (C) Itemized Data Sources.
  - (D) Pointed Data Sources.
43. The weight of a student is 39.35 kg. This is an example of :
- (A) A discrete variable.
  - (B) A continuous variable.
  - (C) An attribute.
  - (D) None of These.
44. Which of the following is not based on all the observations?
- (A) Arithmetic Mean.
  - (B) Geometric Mean.
  - (C) Harmonic mean.
  - (D) Mode.
45. The value of  ${}^5C_2 + {}^{12}C_2 + {}^7C_3$  is
- (A) 101.
  - (B) 201.
  - (C) 301.
  - (D) 401.
46. If  ${}^{25}C_r = {}^{25}C_{2r+1}$ , find the value of r :
- (A) 7.
  - (B) 8.
  - (C) 14.
  - (D) 15.
47. How many two-digit numbers can be formed with the digits 2, 3, 4 when no digit is repeated?
- (A) 4.
  - (B) 5.
  - (C) 6.
  - (D) 7.
48.  $6P_4 + 7P_2 + 10C_2 + 5C_4 = ?$
- (A) 447.
  - (B) 449.
  - (C) 450.
  - (D) 452.

49. If the first term of an AP series is 2 and common difference is 4, then the sum of its first 40 numbers is :
- (A) 3200.
  - (B) 1600.
  - (C) 2000.
  - (D) 2800.
50. Five years ago, A was thrice as old as B and ten years later, A shall be twice as old as B. What is the present age of A :
- (A) 20.
  - (B) 50.
  - (C) 60.
  - (D) 40.
51. Which of the following numbers are completely divisible by 7?
- I. 195195
  - II. 181181
  - III. 120120
  - IV. 891891
- (A) Only I and II.
  - (B) Only III and IV.
  - (C) Only I, II and IV.
  - (D) All are divisible.
52.  $5566 - 7788 + 9988 = ? + 4444$  :
- (A) 3223.
  - (B) 3232.
  - (C) 3322.
  - (D) 3333.
53. How many terms are there in 20, 25, 30, ....., 140?
- (A) 22.
  - (B) 25.
  - (C) 23.
  - (D) 24.
54. If  $5a = 3125$ , then the value of  $5(a-3)$  is :
- (A) 25.
  - (B) 3110.
  - (C) 625.
  - (D) 1625.
55. What is the value of  $[\log_{10} (5 \log_{10} 100)]^2$  ?
- (A) 1.
  - (B) 2.
  - (C) 10.
  - (D) 25.
56. 15% of 45% of a number is 105.3. What is 24% of that number?
- (A) 385.5.
  - (B) 374.4.
  - (C) 390.
  - (D) 375.



57. In an examination 93% of students passed and 259 failed. The total number of students appearing in the examination was :
- (A) 3700.
  - (B) 3850.
  - (C) 3950.
  - (D) 4200.
58. The unit of ratio is :
- (A) CM.
  - (B) INCHES.
  - (C) NO UNIT.
  - (D) RADIANS.
59. The ratio of 2km to 600m should be :
- (A) 2:7.
  - (B) 10:7.
  - (C) 2:3.
  - (D) 10:3.
60. Product of two expressions / L.C.M = :
- (A) H.C.F.
  - (B) L.C.M.
  - (C) H.C.F. + L.C.M.
  - (D) H.C.F. X L.C.M.
61. If  $x$  is a prime number, the LCM of  $x$  and  $(x+1)$  is :
- (A)  $x^2$ .
  - (B)  $(x+1)^2$ .
  - (C)  $x(x+1)/2$ .
  - (D)  $x(x+1)$ .
62. The average of 8 numbers is 21. If each of the number is multiplied by 8, then find the average of new set of numbers :
- (A) 168.
  - (B) 167.
  - (C) 158.
  - (D) 161.
63. How many number of arrangement can be formed with the word "CHAIR" if the first place is always held by the letter "C"?
- (A) 22.
  - (B) 24.
  - (C) 26.
  - (D) 28.
64. If the length of a rectangle increases by 12% and the breadth increases by 10%, then the % increase in area is :
- (A) 20%.
  - (B) 20.20%.
  - (C) 22%.
  - (D) 23.20%.

65. In a zoo, there are elephant and peacock. If their heads are counted they are 50 while their legs are 140. Find the number of peacock in the zoo :
- (A) 30.  
(B) 20.  
(C) 40.  
(D) 25.
66. In how many ways can the letter of the word 'LEADER' be arranged?
- (A) 72.  
(B) 144.  
(C) 360.  
(D) 720.
67.  $(0.9\% \text{ of } 450) \div (0.2\% \text{ of } 250) = ?$
- (A) 5.04.  
(B) 7.5.  
(C) 8.1.  
(D) 9.
68. If the numbers from 5 to 85 which are exactly divisible by 5 are arranged in descending order, which would come at the 11th place?
- (A) 35.  
(B) 40.  
(C) 50.  
(D) 55.
69. What is the greatest number that will divide 29, 66 and 103 and will leave as remainders 5, 6 and 7 respectively?
- (A) 24.  
(B) 16.  
(C) 12.  
(D) 14.
70. The sum of the squares of two natural consecutive odd numbers is 394. The sum of the numbers is :
- (A) 24.  
(B) 32.  
(C) 40.  
(D) 28.
71. Average production of a farm was 1500 tons in the months Jan-March. If April with 1200 tones is included. What will be the new average from Jan-April?
- (A) 1500.  
(B) 1600.  
(C) 1700.  
(D) 1425.
72. In a village the current birth rate per thousand is 55 whereas corresponding death rate is 34 per thousand. The net growth rate in term of population increase will be :
- (A) 0.021%.  
(B) 0.0021%.  
(C) 21%.  
(D) 2.1%.

**JEMAS(PG) – 2023 DHS**

73. The average of 5 members of a family is 24 years. If the youngest member is 8 years old, then what was the average age (in years) of the family at the time of the birth of the youngest member?  
(A) 16.  
(B) 20.  
(C) 24.  
(D) 32.
74. There are four different bags. Also, there are four different coins. In how many ways can the coins be put into bags if there are exactly two coins in exactly one of the bags?  
(A) 48.  
(B) 96.  
(C) 72.  
(D) 144.
75. The population of a town increases every year by 4%. If its present population is 50,000 then after 2 years, it will be :  
(A) 53,900.  
(B) 54,000.  
(C) 54,080.  
(D) 54,900.
76. There are two examination rooms A and B. If 10 students are sent from A to B, then the number of students in each room is the same. If 20 candidates are sent from B to A, then the number of students in A is double the number of students in B. The number of students in room A is :  
(A) 20.  
(B) 80.  
(C) 100.  
(D) 200.
77. Second Saturday and Every Sunday is a holiday. How many working days will be there in a month of 30 days beginning on a Saturday?  
(A) 21.  
(B) 22.  
(C) 23.  
(D) 24.
78. A certain number when divided by 175 leaves a remainder 132. When the same number is divided by 25, the remainder is :  
(A) 6.  
(B) 7.  
(C) 8.  
(D) 9.
79. If  $x+y=10$  and  $xy=4$ , then what is the value of  $x^4+y^4$ ?  
(A) 8432.  
(B) 8464.  
(C) 7478.  
(D) 6218.

80. The average of 11 consecutive even number is 62. Find out the greatest even number of the series :
- (A) 72.
  - (B) 68.
  - (C) 76.
  - (D) 52.
81. Which of the following statement is not correct?
- (A)  $\log_{10} 10 = 1$ .
  - (B)  $\log (2+3) = \log (2 \times 3)$ .
  - (C)  $\log_{10} 1 = 0$ .
  - (D)  $\log (1+2+3) = \log 1 + \log 2 + \log 3$ .
82. If  $\log 27 = 1.431$ , then the value of  $\log 9$  is :
- (A) 0.934.
  - (B) 0.945.
  - (C) 0.954.
  - (D) 0.958.
83. If  $a:b = 2:3$  and  $b:c = 4:5$ , find  $a^2:b^2:bc$  :
- (A) 04:09:45.
  - (B) 16:36:45.
  - (C) 16:36:20.
  - (D) 04:36:40.
84. Find the first term of an AP whose 8th and 12th terms are respectively 39 and 59 :
- (A) 5.
  - (B) 6.
  - (C) 4.
  - (D) 3.
85. If the fifth term of a GP is 81 and first term is 16, what will be the 4th term of the GP?
- (A) 36.
  - (B) 18.
  - (C) 54.
  - (D) 24.
86. In an examination 80% candidates passed in English and 85% candidates passed in Mathematics. If 73% candidates passed in both these subjects, then what per cent of candidates failed in both the subjects?
- (A) 8.
  - (B) 15.
  - (C) 27.
  - (D) 35.
87. In an isosceles triangle:
- (A) all sides are equal in length.
  - (B) 2 sides are equal in length.
  - (C) all sides have different lengths.
  - (D) None of the above.

88. In how many ways can a leap year have 53 Sundays?  
(A)  ${}^{365}C_7$ .  
(B) 7.  
(C) 4.  
(D) 2.
89. Stages of cancer is an example of :  
(A) Nominal data.  
(B) Ordinal data.  
(C) Linear function.  
(D) Complex Number.
90. Which one is affected by extreme values?  
(A) Mean.  
(B) Median.  
(C) Mode.  
(D) None.
91. Ogive is formed with the help of :  
(A) Frequency.  
(B) Scatterness.  
(C) Linear function.  
(D) None.
92. The mean and median are given by 4 and 12, respectively. Then the mode is :  
(A) 27.  
(B) 28.  
(C) 29.  
(D) 30.
93. The median of the data: 17, 2, 7, 27, 15, 5, 14, 8, 10, 24, 48, 10, 8, 7, 18, 28 is :  
(A) 12.  
(B) 14.  
(C) 15.  
(D) 16.
94. The number 2048 is which term of the geometric sequence 2, 8, 32, 128,.....  
(A) 8.  
(B) 6.  
(C) 10.  
(D) 5.
95. The algebraic sum of the deviations of a frequency distribution from its mean is :  
(A)  $>0$ .  
(B)  $<0$ .  
(C) 0.  
(D) None.
96. The addition of a rational number and an irrational number is equal to :  
(A) Rational number.  
(B) Irrational number.  
(C) Both A & B.  
(D) None.

97. The sum or difference of two irrational numbers is always :
- (A) Rational.
  - (B) Irrational.
  - (C) Rational or irrational.
  - (D) Not determined.
98.  $n^2 - 1$  is divisible by 8, if n is :
- (A) An integer.
  - (B) A natural number.
  - (C) An odd integer.
  - (D) An even integer.
99.  $P(A \cap B)$  is equal to :
- (A)  $P(A) \cdot P(B|A)$ .
  - (B)  $P(B) \cdot P(A|B)$ .
  - (C) Both A and B.
  - (D) None.
100. If  $P(A \cap B) = 70\%$  and  $P(B) = 85\%$ , then  $P(A|B)$  is equal to :
- (A)  $17/14$ .
  - (B)  $14/17$ .
  - (C)  $7/8$ .
  - (D)  $1/8$ .

ROUGH WORK ONLY