

Code No.

**R – 2113**

**Entrance Examination for Admission to the P.G. Courses in the  
Teaching Departments, 2023**

**CSS**

**DEMOGRAPHY & BIOSTATISTICS**

**General Instructions**

1. The Question Paper is having 100 Objective Questions, each carrying one mark.
2. The answers are to be (✓) 'tick marked' **only** in the "**Response Sheet**" provided.
3. **Negative marking** : **0.25 marks** will be deducted for each wrong answer .

**Time : 2 Hours**

**Max. Marks : 100**

To be filled in by the Candidate									
Register Number	in Figures								
	in words								

Choose appropriate answer from the options in the questions.

**(100 × 1 = 100 marks)**

1. Find the value of  $\lim_{x \rightarrow \infty} 2x \sin \frac{2}{x}$

a)  $\frac{1}{2}$

b) 2

c) 4

d) 8

DO NOT WRITE HERE

2. Angle between the two line  $y - 2x = 4$  and  $x + 2y = -5$  is

a)  $60^\circ$

b)  $30^\circ$

c)  $90^\circ$

d)  $45^\circ$

3. If  $y = \log\left(\frac{1-x^2}{1+x^2}\right)$ , then  $\frac{dy}{dx}$  is equal to

a)  $\frac{4x^3}{1-x^4}$

b)  $\frac{-4x}{1-x^4}$

c)  $\frac{1}{4-x^4}$

d)  $\frac{-4x^3}{4-x^4}$

4. If  $y = e^{x^2} \sin 2x$ , then what is  $\frac{dy}{dx}$  at  $x = \pi$ 
  - a)  $(1 + \pi)e^{\pi^2}$
  - b)  $2\pi e^{\pi^2}$
  - c)  $e^{\pi^2}$
  - d)  $2e^{\pi^2}$
5.  $\int_0^{\frac{\pi}{4}} \sin^3 \theta d\theta = ?$ 
  - a)  $\frac{2}{3} - \frac{5}{6\sqrt{2}}$
  - b)  $-\frac{2}{3} + \frac{5}{6\sqrt{2}}$
  - c)  $\frac{2}{3} + \frac{5}{6\sqrt{2}}$
  - d)  $-\frac{2}{3} - \frac{5}{6\sqrt{2}}$
6. Solution of the differential equation  $\cos x dy = y(\sin x - y) dx$ ,  $0 < x < \frac{\pi}{2}$  is
  - a)  $y \sec x = \tan x + c$
  - b)  $\sec x = (\tan x + c)y$
  - c)  $\tan x = \sec x + c$
  - d)  $\tan x = (\sec x + c)y$
7. Consider the following in respect of two non-singular matrices  $A$  and  $B$  of the same order
  1.  $\det(A + B) = \det A + \det B$
  2.  $(A + B)^{-1} = A^{-1} + B^{-1}$Which of the above is/are correct?
  - a) 1 only
  - b) 2 only
  - c) both 1 and 2
  - d) Neither 1 nor 2
8. The value of the crossproduct  $(\vec{a} - \vec{b}) \times (\vec{a} + \vec{b})$  of two vectors  $(\vec{a} - \vec{b})$  and  $(\vec{a} + \vec{b})$  is
  - a)  $a^2 - b^2$
  - b)  $2(\vec{a} \times \vec{b})$
  - c)  $(\vec{a} \times \vec{b})$
  - d)  $(\vec{b} \times \vec{a})$

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16. For a given data mean height was 140 cm and SD was 20 cm for a given person with height 120 the z score is
- a) +1
  - b) +2
  - c) -1
  - d) None of the above
17. When a researcher wants to know whether 2 dichotomous variables are correlated, the ideal measure is
- a) Point biserial correlation
  - b) Phi coefficient
  - c) Spearman rho
  - d) None of the above
18. A measures of location dividing the distribution in the ratio 1 :3 is
- a) First quartile
  - b) Quartile Deviation
  - c) Second quartile
  - d) Median
19. When extreme values are present in a data set, the most suitable average is
- a) Harmonic mean
  - b) Geometric Mean
  - c) Arithmetic average
  - d) All of the above
20. Out of 51 students, 25 have weight below 58 kg and 25 students have weight above 58 kg, the value 58 kg represents
- a) Geometric mean
  - b) Median
  - c) Mode
  - d) Inter quartile range
21. For a zero correlation, the two regression lines will be
- a) parallel
  - b)  $90^\circ$  angular separation
  - c)  $60^\circ$  angular separation
  - d) None of the above
22. Which of the following is not related to sign test?
- a) Uses the binomial distribution
  - b) Assumes normality
  - c) Analyze sign of differences
  - d) All of the above

23. In hypothesis testing Type 1 error means
- a) Rejecting  $H_0$  when it is true
  - b) Accepting  $H_0$  when it is false
  - c) Accepting  $H_0$  when it is true
  - d) Rejecting  $H_0$  when it is false
24. Which one is precondition for demographic dividend?
- a) Good health
  - b) Quality education
  - c) Low fertility, low mortality
  - d) All of the above
25. If 25 observations are arranged in ascending order the middle value is
- a) Median
  - b) Second quartile
  - c) 50th percentile
  - d) All of the above
26. Which of the following agency conducts multiple indicator survey in India?
- a) The national sample survey office
  - b) Register general India
  - c) National family health survey
  - d) Sample registration system
27. When was the last round of NFHS conducted?
- a) 2015-16
  - b) 2005-2006
  - c) 2019-21
  - d) 2020-2022
28. Which measure is more suitable for averaging observation related to time
- a) Arithmetic mean
  - b) Harmonic mean
  - c) Geometric mean
  - d) Weighted mean
29. Which of the following are used to develop and interpret physical growth charts?
- a) Percentile
  - b) 95% CI
  - c) Quartiles
  - d) Coefficient of range

30. Which measure is preferred to compared distributions measured in different scales?
- a) Inter quartile range
  - b) Median
  - c) Quartile deviation
  - d) Coefficient of variation
31. In India which agency periodically publish reports on vital events?
- a) NSS
  - b) SRS
  - c) NFHS
  - d) Ministry of Health
32. In which year family planning programme was introduced in India?
- a) 1947
  - b) 1956
  - c) 1960
  - d) None of the above
33. The denominator of infant mortality rate is
- a) Total births
  - b) Live births
  - c) Children below 1 year
  - d) No of deliveries
34. The collective term related to marriage divorce, remarriage is
- a) Fertility
  - b) Fecundity
  - c) Nuptiality
  - d) Net reproduction
35. Which of the following is not a component in the calculation of physical quality of life index?
- a) Life expectancy at age 1
  - b) Literacy
  - c) Infant mortality
  - d) Per capita income
36. In a positivity skewed data
- a) Mean < Median < Mode
  - b) Mean < Median > Mode
  - c) Mean > Median > Mode
  - d) Mean > Median < mode
37. Physical growth can be best assessed by finding
- a) Height for age
  - b) Skinfold thickness
  - c) Weight for age
  - d) Chest circumference

38. For a set of data mean was 400 and SD was 20. The C V % is
- a) 10
  - b) 5
  - c) 100
  - d) None of the above
39. The survey method in which some information is collected from every unit and detailed information is collected for subsample is called
- a) Cluster sampling
  - b) Multi stage sampling
  - c) Multiphase sampling
  - d) Quota sampling
40. In India first national health policy was announced in
- a) 1952
  - b) 1973
  - c) 1983
  - d) 2000
41. Ayushman Bharat Yojana stands for
- a) Elderly care
  - b) Health Insurance
  - c) Adolescent health
  - d) Immunization coverage
42. In India first comprehensive health policy and plan document was prepared by the committee led by
- a) Bhore
  - b) Sokhey
  - c) Swaminathan
  - d) None of the above
43. Which measure is used to compared variability of the same character in 2 or more groups
- a) Variance
  - b) Standard error
  - c) Coefficient of variation
  - d) Quartile deviation
44. Of the following tools, which one has to be filled by the respondent?
- a) Questionnaire
  - b) Schedule
  - c) Checklist
  - d) All of the above



45. Which of the following is not true for a statistical population?
- a) parameter is variable
  - b) statistics is variable
  - c) statistics is an estimate of parameter
  - d) all of the above
46. The birth rate of Kerala is
- a) 11
  - b) 12
  - c) 13
  - d) 14
47. A study shows that for a smoker probability of developing hypertension is 0.6. find the odds for a smoker to develop hypertension
- a) 0.4
  - b) 1/0.4
  - c) 1/06
  - d) None of the above
48. Vital statistics deals with
- a) Births and deaths
  - b) Births, deaths, migration
  - c) Births, deaths, marriages
  - d) Births deaths, marriages and sickness
49. Power of a study can be improved by
- a) Increasing  $\alpha$  error
  - b) Decreasing  $\alpha$  error
  - c) Decreasing  $\beta$  error
  - d) None of the above
50. In birth and death registration Act death must register within
- a) 24 hour
  - b) 72 hours
  - c) 48 hours
  - d) 7 days
51. National rural health mission has been launched
- a) 1989
  - b) 2000
  - c) 2005
  - d) 2010

52. In a test of significance in which two means are compared the  $p$  value obtained is 0.05 we can conclude
- a) Null hypothesis accepted
  - b) Null hypothesis rejected
  - c) Alternate hypothesis rejected
  - d) No conclusion can be made
53. Who coined the phrase unity in diversity?
- a) Mahatma Gandhi
  - b) Jawaharlal Nehru
  - c) Sardar Vallabhai Patel
  - d) Indira Ghandi
54. Who is called founding father of sociology?
- a) Herbert Spencer
  - b) Karl Marx
  - c) Spencer
  - d) Auguste Comte
55. The study of interrelationship of all living things is called
- a) Ecology
  - b) Epidemiology
  - c) Anthropology
  - d) Social pathology
56. The number of arrangements of 10 objects taken 3 at a time is
- a) 360
  - b) 720
  - c) 320
  - d) None of the above
57. In which decade Indian population had shown a decline
- a) 1911-21
  - b) 1941-51
  - c) 1951-61
  - d) None of the above
58. A classificatory scale is also known as
- a) Nominal scale
  - b) Ordinal scale
  - c) Interval scale
  - d) Ratio scale
59. In the calculation of young dependency ratio, numerator is formed by population below
- a) 18 years
  - b) 15 years
  - c) 10 years
  - d) None of the above

60. If the 95% confidence interval for prevalence of depression among elderly is 20% to 30%, the chance that the prevalence could be less than 20% is
- a) 10%
  - b) 2.5%
  - c) 5%
  - d) None of the above
61. Which year is considered as year of demographic divide in India?
- a) 1901
  - b) 1911
  - c) 1921
  - d) 1951
62. As per the 2011 census which state had highest percentage of scheduled castes in the population
- a) Tamil Nadu
  - b) Uttar Pradesh
  - c) Bihar
  - d) Punjab
63. The theory of demographic transition with four stages was given by
- a) Karl Marx
  - b) John Graunt
  - c) Malthus
  - d) Warren Thompson
64. Who is the chief registrar of births and deaths in Kerala Under Births and deaths registration Act?
- a) Director of health services
  - b) Director of Economic and statistics
  - c) Director of social welfare department
  - d) Joint Director of Panchayat
65. The phenomenon of judging other people cultures based on the standards of one's own culture is known as
- a) Anomie
  - b) Ethocentrism
  - c) Assimilation
  - d) Cultural bias
66. In research studies, reduction of random errors leads to :
- a) Increasing precision
  - b) Increasing validity
  - c) Berksons bias
  - d) Decrease in selection bias

67. A researcher has to select a sample from a given population. The population is large, heterogonous but a complete list is available. The researcher can employ
- Simple random sampling
  - Systematic random sampling
  - Cluster random sampling
  - Multi stage sampling
68. Which of the following is not true, advantages of questionnaire method
- Easy
  - Cost effective
  - Interviewer not required
  - High response rate
69. Which of the statement is correct about NITI AYOOG?
- It was established in 2016
  - Prime minister is the chairperson
  - It comes under ministry of commerce
  - It is a policy think tank of the government of India
70. Which of the following indicate advances in economic development?
- Increase in GDP
  - Increase in national income
  - Increase in life expectancy
  - All of the above
71. Annual world population growth (%)
- Below 1
  - 1 - 1.3
  - 1.3 - 1.5
  - None of the above
72. What will happen if the confidence level of a test is increased?
- No effect on significance
  - Previous insignificance will become significant
  - Previous significance will become insignificant
  - None of the above

73. Which of the following measure is time dependent?
- a) Percentage
  - b) Rate
  - c) Ratio
  - d) Proportion
74. What was the census date followed in India?
- a) First January
  - b) First of March
  - c) First of April
  - d) None of the above
75. RCH programme was introduced in the year
- a) 1983
  - b) 2004
  - c) 1997
  - d) None of the above
76. World AIDS day is celebrated on
- a) December 1<sup>st</sup>
  - b) April 7<sup>th</sup>
  - c) January 1<sup>st</sup>
  - d) None of the above
77. Surplus theory of population was put forward by
- a) Karl Max
  - b) Dumont
  - c) Malthus
  - d) Herbert Spencer
78. The numerator of prevalence rate is
- a) New cases of disease
  - b) Old cases of disease
  - c) New and old case
  - d) Population likely to develop the disease
79. Which of the following is an example of non-probability sample?
- a) Stratified random sampling
  - b) Quota sampling
  - c) Multi stage sampling
  - d) Cluster sampling
80. Which of the following is not principle of sample survey?
- a) Optimization
  - b) Validity
  - c) Regularity
  - d) Reliability

81. The shape of chi square distribution is
- a) Symmetric
  - b) Positively skewed
  - c) Negatively skewed
  - d) Biomodal
82. The variance of chi square distribution with in degrees of freedom is
- a)  $2n$
  - b)  $n$
  - c)  $n^2$
  - d)  $\sqrt{n}$
83. The first Indian book on population was written by
- a) Dr. Chandrasekhar
  - b) Dr. P K Wattal
  - c) Dr. Sreenivasan
  - d) Dr. J.N. Desai
84. The term de jure method is related to
- a) Family planning
  - b) Vital statistics
  - c) Census
  - d) Sample survey
85. The book “essay on the principle of population as it affects the future improvements of society” was authorized by
- a) Thomas Robert Malthus
  - b) Margaret sanger
  - c) Carr Saunders
  - d) Thomas Doubleday
86. Which Indian stage had the highest proportion of persons above the age of 60 years?
- a) Goa
  - b) Kerala
  - c) Tamil Nadu
  - d) Karnataka
87. What was the theme of world population day 2022?
- a) Harnessing opportunities and ensuring rights and choices for all
  - b) Vulnerable population emergencies
  - c) Care of aged
  - d) Protect baby girl

88. The national population policy of India 2000 put the objective of stabilization of Indian population by
- a) 2030
  - b) 2045
  - c) 2050
  - d) None of the above
89. Neonatal deaths mean deaths in the
- a) First week of life
  - b) First month of life
  - c) First 4 months of life
  - d) None of the above
90. The range of chi square test is
- a) 0 to  $\infty$
  - b)  $-\infty$  to  $+\infty$
  - c) 0 to 1
  - d) -1 to +1
91. Length (Km) of coastal area of Kerala is
- a) 580
  - b) 1030
  - c) 1100
  - d) None of the above
92. Major crop of India is
- a) Wheat
  - b) Cotton
  - c) Rice
  - d) Barley
93. Which Indian state had highest infant mortality rate?
- a) Chhattisgarh
  - b) Madhya Pradesh
  - c) Uttar Pradesh
  - d) Assam
94. Randomness of a distribution can be tested using
- a) Mann Whitney U
  - b) Kruskal Wallis
  - c) Runs Test
  - d) Wilcoxon Signed rank test

95. Which Indian state had highest number of industries?
  - a) Uttar Pradesh
  - b) Tamil Nadu
  - c) Maharashtra
  - d) Gujarat
96. Method of moments was developed by
  - a) Fisher
  - b) Neyman
  - c) Snedecor
  - d) Karl Pearson
97. Kolmogorov Smirnov test is for testing
  - a) Equality of means
  - b) Randomness
  - c) Normality
  - d) Equality of variance
98. The regression line of Y on X minimises total of the squares of the
  - a) Horizontal deviations
  - b) Vertical deviations
  - c) Both horizontal and vertical deviations
  - d) None of the above
99. When the paired ranks are in the same order, Spearman's rho is
  - a) +1
  - b) -1
  - c) 0
  - d) None of the above
100. In a symmetrical distribution
  - a)  $Q_3 - Q_2 > Q_2 - Q_1$
  - b)  $Q_3 - Q_2 < Q_2 - Q_1$
  - c)  $Q_3 - Q_2 = Q_2 - Q_1$
  - d) None of the above



# ANSWER SHEET

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

## **ROUGH WORK**

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