Code No. **J** – 2274

## Entrance Examination for Admission to the P.G. Courses in the Teaching Departments, 2020 CSS **DEMOGRAPHY AND BIOSTATISTICS General Instructions** The Question Paper is having two Parts - Part 'A' Objective type (60%) & Part 'B' 1. Descriptive type (40%). 2. Objective type questions which carry 1 mark each are to be $(\checkmark)$ 'tick marked' in the response sheets against the appropriate answers provided. 8 questions are to be answered out of 12 questions carrying 5 marks each in Part 'B'. 3. 4. Negative marking : 0.25 marks will be deducted for each wrong answer in Part 'A'. Time : 2 Hours Max. Marks: 100 To be filled in by the Candidate Register in Figures Number in words

### PART – A

#### (Objective Type)

Choose appropriate answer from the options in the questions. **One** mark **each**.

 $(60 \times 1 = 60 \text{ marks})$ 

- 1. (2x-3)(x-2) is polynomial of degree
  - a) 2 b) 1
  - c) 0 d) None of these

DONOTWRITEHERE

# 2. If f(x) = x - 1 and $g(x) = x^2$ , determine the value of x for which f(g(x)) = g(f(x))

- a) D b) 1
- c) 2 d) None

3. If 
$$f(x) = \frac{x+1}{x-1}$$
, where  $x \neq 1$ , then  $(f \circ f \circ f)(x) =$   
a)  $\frac{1}{f(x)}$  b)  $-f(x)$ 

c) f(x) d) 1

- 4. If 12 workers complete a job in 4 hours, how long should it take 15 workers to complete the job
  - a) 2 hrs. 40 min. b) 3 hrs.
  - c) 3 hrs. 30 min. d) 3 hrs. 12 min.

5. By which year India will have the largest working-age population in the world?

- a) 2025 b) 2030
- c) 2035 d) None of these

6. According to Budget 2020, India is set to become \$5 trillion economy by the end of

- a) 2030 b) 2025
- c) 2024 d) 2023
- 7. What is the district without area under forest cover in Kerala?
  - a) Kollam b) Alappuzha
  - c) Kottayum d) Idukki
- 8. Birth rate is the number of births per of the population during one year.
  - a) 100 b) 1000
  - c) 10000 d) 10000
- 9. What was the population growth rate of India from 2001 to 2011?
  - a) 17.72% b) 7.28%
  - c) 21.8% d) 27.72%

10. Which of the following state has the lowest population growth rate in India?

- a) Goa b) Kerala
- c) Andhra Pradesh d) Tamil Nadu

11. What percentage of the total population of India lives in Uttar Pradesh?

- a) 20% b) 11%
- c) 16% d) 26%

12. As per 2011 census, the percent of urban population in the total population of India is

- a) 31% b) 35%
- c) 30% d) 25%

13. Who is the present Census Commissioner of India?

a) Vivek Joshib) A.R. Nandac) Sunil Arorad) Manoj Kumar

14. Which state has the lowest woman literacy rate in India as per the census 2011?

- a) Uttar Pradesh b) Bihar
- c) Rajasthan d) Madhya Pradesh

15. When was the First Five Year Plan implemented?

- a) 1951–56 b) 1947–50
- c) 1956–61 d) 1961–66
- 16. The outbreak of Novel Corona virus is noticed in the city of — in China.
  - a) Wuhu b) Beijing
  - c) Wuwei d) Wuhan

17. The National Institute of Virology is located ———— in India.

- a) Pune b) Chennai
- c) Hyderabad d) Delhi

18. If 
$$A = \begin{bmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{bmatrix}$$
 is a non-singular matrix then *A* is invertible and  $A^{-1}$   
a)  $\frac{\operatorname{Adj} A}{\det A}$  b)  $\frac{1}{\det A}$   
c)  $\operatorname{Adj} A \cdot \det A$  d)  $\frac{\det A}{\operatorname{Adj} A}$ 

19. If 
$$(\cos \theta + \sec \theta) = \frac{5}{2}$$
, then  $(\cos^2 \theta + \sec^2 \theta) =$   
a)  $\frac{33}{4}$ 
b)  $\frac{21}{4}$   
c)  $\frac{29}{4}$ 
d)  $\frac{17}{4}$ 

- 20. If *a*, *b*, *c* are the position vectors of the vertices of a triangle ABC, then the position vector of its centroid is
  - a)  $\frac{1}{a} + \frac{1}{b} + \frac{1}{c}$ b) 3(a+b+c)c)  $\frac{a+b+c}{3}$ d)  $\frac{3}{a+b+c}$

21. If  $A+B+C=180^{\circ}$ , then  $\tan A+\tan B+\tan C=$ 

- a)  $\tan A \tan B \tan C$  b)  $1 + \tan A \tan B \tan C$
- c)  $2 + \tan A \tan B \tan C$  d) 1

- 22. If 18 binders bind 9000 books in 10 days, how many binders will be required to bind 6600 books in 12 days?
  - a) 55 b) 14
  - c) 13 d) 11
- 23. ———— is the value of the variable which divides in to two equal parts of the distribution.
  - a) Median
  - b) Mode
  - c) Mean
  - d) Standard Deviation
- 24. Ideal measure of dispersion is
  - a) Mean deviation b) Standard deviation
  - c) Squared deviation d) Normalization
- 25. The mean and variance of a binomial distribution are 4 and 2 respectively, then the probability of 2 successes is
  - a) 37/256 b) 219/256
  - c) 128/256 d) 28/256
- 26. Pie diagram is used when the focus is on
  - a) Comparison
  - b) Part of the whole
  - c) Data interval
  - d) Continues display of trend

- 27. In a frequently distribution, the mean and median are 21 and 22 respectively, then its mode is approximately
  - a) 20.5 b) 22.0
  - c) 24.0 d) 25.5

28. The solution of the equations x - y = 2 and x + y = 4 is

- a) 3 and 5 b) 5 and 3
- c) 3 and 1 d) -1 and -3

29. When the values in a series are not of equal importance, we calculate the

- a) Arithmetic mean b) Geometric mean
- c) Weighted mean d) Mode

30. Questionnaire survey method is used to collect

- a) Secondary data b) Qualitative variable
- c) Primary data d) None of these
- 31. Number of trails are large i.e.  $n \rightarrow 0$  the probability of success signal i.e.  $P \rightarrow 0$ , then binomial distribution tends to
  - a) Poisson Distribution
  - b) Probability Distribution
  - c) Normal Distribution
  - d) None of the above

- 32. In the moderately symmetrical series, the arithmetic mean, median and mode are related as
  - a) Mean Mode= 3 (Mean Median)
  - b) Mean Median = 2 (Median Mode)
  - c) Median Mode = (Mean Median) / 2
  - d) Mode Median = 2 Mean 2 Median
- 33. The population of the country increased by an average of 2% per year from 2000 to 2003. If the population of this country was 20,00,000 on December 31, 2003, then the population on this country on Jan 1, 2000 to the nearest thousand would have been

a)	18,46,000	b)	18,52,000
/	, ,		, ,

- c) 10,00,000 d) 15,00,000
- 34. Population census is conducted through
  - a) Accountability b) Investigation
  - c) Complete enumeration d) Sample Survey
- 35. Census reports used as a source of data is
  - a) Primary source b) Secondary source
  - c) Organized data d) None
- 36. Population of a state increased by 9%, 16% respectively from the year 2012 to 2013. What is the average increase over these years?
  - a) 12.5% b) 9%
  - c) 12% d) 14%

- 37. What is the definition of sex ratio?
  - a) Number of deaths per 1000 live births of children
  - b) Number of women per 1000 men
  - c) Number of women per 10,00,000 men
  - d) Number of men per 1000 women

38. The highest sex ratio in the whole India is in

- a) Kerala b) Punjab
- c) Andhra Pradesh d) Tamil Nadu

39. What was the Total Fertility Rate (TFR) in India?

a) 2-1c) 2-4b) 2-3d) 2-0

40. Which state of India has the lowest and highest infant mortality rate respectively?

- a) Kerala, Bihar b) Odisha, Jharkhand
- c) Goa, Madhya Pradesh d) Maharashtra and Uttar Pradesh

#### 41. World Environment Day is celebrated on

- a) 5<sup>th</sup> April b) 5<sup>th</sup> May
- c) 5<sup>th</sup> June d) 5<sup>th</sup> July
- 42. Sex ratio of Kerala according to 2011 census was
  - a) 940 b) 984
  - c) 1030 d) 1084

- 43. Which one of the following state is called as Gods own country in India?
  - a) Goa b) Karnataka
  - c) Tamil Nadu d) Kerala
- 44. Indian Space Research Organization (ISRO) is situated in
  - a) Sriharikota b) Bangalore
  - c) Ahmedabad d) Amritsar
- 45. Expand the term IPCC
  - a) Inter-Governmental Panel on Climate Change
  - b) Interim Panel of Climate Change
  - c) International Pollution Control Council
  - d) International Population Control Council
- 46. According to census 2011, which one of the following state has lowest population in India?
  - a) Manipur b) Arunachal Pradesh
  - c) Sikkim d) Goa
- 47. Which of the following cities has the most populous in India?
  - a) Delhi b) Mumbai
  - c) Calcutta d) Bangalore
- 48. Queen of Arabian Sea is
  - a) Chennai b) Kochi
  - c) Goa d) Bangalore
    - 10

49.	How many states and Union Territories (UT) are there in India at present?							
	a)	29 States & 7 UTS	b)	28 States & 8 UTS				
	c)	29 States & 8 UTS	d)	28 States & 7 UTS				
50.	Total earth's surface covered by water is							
	a)	75%	b)	85%				
	c)	65%	d)	50%				
- 4	N 4 - 14		(					
51.	iviait	nus nas ———— of birth com	troi.	Discourse d				
	a)	Approved	b)	Disapproved				
	C)	Neutral	d)	None of the above				
52.	Who	is acclaimed as the father of Dem	ogra	phv?				
	a)	John Gruant	b)	Malthus				
	c)	Edmund Halley	d)	Kingsley Davis				
53.	Who wrote "an Essay on the Principles of Population"?							
	a)	Thomas R. Malthus	b)	S. Thompson				
	c)	S. Chandrasekharan	d)	Confucius				
			_					
54.	Inter	rnational Institute for Population Sc	cience	es is located in				
	a)	Bombay	b)	Chennai				
	c)	Calcutta	d)	Hyderabad				
FF	<b>T</b> h <i>e</i>			lant India in the vicer				
ວວ.	i ne	1054	spenc					
	a)	1951	D)	1900				
	c)	1947	d)	1961				

- 56. Who postulated Population when unchecked increases in a geometrical ratio, subsistence increases only in an arithmetical ratio
  - a) Malthus b) Aristotle
  - c) J.S. Mill d) David Ricardo

57. Which one is the highest population district in Kerala?

- a) Thiruvananthapuram
- b) Malappuram
- c) Cochin
- d) Alappuzha
- 58. refers to the capacity of a man, a woman or a couple to participate in reproduction.
  - a) Fertility b) Fecundity
  - c) Natality d) Nuptiality
- 59. ———— is the difference between the total number of persons who arrive and the total number of persons who leave.
  - a) Gross Migration
  - b) Actual Migration
  - c) Net Migration
  - d) Volume of Migration
- 60. A study of relations between organism and their environment is called
  - a) Zoology b) Ecology
  - c) Geography d) Topography

ANSWER SHEET — PART – A

1	А	В	С	D	Е
2	А	В	С	D	Е
3	А	В	С	D	Е
4	А	В	С	D	Е
5	А	В	С	D	Е
6	А	В	С	D	Е
7	А	В	С	D	Е
8	А	В	С	D	Е
9	А	В	С	D	Е
10	А	В	С	D	Е
11	А	В	С	D	Е
12	А	В	С	D	Е
13	А	В	С	D	Е
14	А	В	С	D	Е
15	А	В	С	D	Е
16	А	В	С	D	Е
17	А	В	С	D	Е
18	А	В	С	D	Е
19	А	В	С	D	Е
20	А	В	С	D	Е

21	А	В	С	D	Е
22	А	В	С	D	Е
23	А	В	С	D	Е
24	А	В	С	D	Е
25	А	В	С	D	Е
26	А	В	С	D	Е
27	А	В	С	D	Е
28	А	В	С	D	Е
29	А	В	С	D	Е
30	А	В	С	D	Е
31	А	В	С	D	Е
32	А	В	С	D	Е
33	А	В	С	D	Е
34	А	В	С	D	Е
35	А	В	С	D	Е
36	А	В	С	D	Е
37	А	В	С	D	Е
38	А	В	С	D	Е
39	А	В	С	D	Е
40	А	В	С	D	Е

41	А	В	С	D	Е
42	А	В	С	D	Е
43	А	В	С	D	Е
44	А	В	С	D	Е
45	А	В	С	D	Е
46	А	В	С	D	Е
47	А	В	С	D	Е
48	А	В	С	D	Е
49	А	В	С	D	Е
50	А	В	С	D	Е
51	А	В	С	D	Е
52	А	В	С	D	Е
53	А	В	С	D	Е
54	А	В	С	D	Е
55	А	В	С	D	Е
56	А	В	С	D	Е
57	А	В	С	D	Е
58	А	В	С	D	Е
59	А	В	С	D	Е
60	А	В	С	D	Е

## **DEMOGRAPHY AND BIOSTATISTICS**

PART – B

(Descriptive Type)

Answer any eight questions.

 $(8 \times 5 = 40 \text{ Marks})$ 

1. Resolve into partial fractions :

(a) 
$$\frac{5x^2+2}{x^2+x}$$

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

- 2. Solve:  $(1 + y^2) dx + (\tan^{-1} y x) dy$ .
- 3. The following are the marks of students in mathematics and statistics in a test, calculate correlation between them.

Student :	1	2	3	4	5	6	7	8	9	10
Marks in Mathematics :	78	36	98	25	75	82	90	62	65	39
Marks in Statistics :	84	51	91	60	68	62	86	58	53	47

- 4. Explain the Chi-Square test and its advantages.
- 5. Write about the gender issues in India.

- 6. Explain the factors affecting status of women.
- 7. Describe the role of NGO's in social development.
- 8. Explain the social determinants of fertility and mortality.
- 9. What are the main sources of air, water and soil pollution?
- 10. Explain the relationship between Population growth and economic development.
- 11. Briefly discuss the features of Kerala's economy.
- 12. Distinguish renewable and non-renewable energies sources.