Reg. No. :....

# Code No. : 30355 E Sub. Code : JNMA 3 B/ JNMC 3 B/SNMA 3 B

### U.G.(CBCS) DEGREE EXAMINATION, NOVEMBER 2020.

Third Semester

Mathematics/Mathematics with CA - Main

Non-Major Elective — FUNDAMENTALS OF STATISTICS – I

(For those who joined in July 2016 onwards)

Time : Three hours

Maximum : 75 marks

PART A —  $(10 \times 1 = 10 \text{ marks})$ 

Answer ALL questions.

Choose the correct answer :

- 1. Geographical classification means classification of data according to ———
  - (a) time (b) location
  - (c) attributes (d) class interval
- 2. Diagrams and graphs are tools of
  - (a) analysis (b) collection of data
  - (c) presentation (d) summarisation

(8 pages)

3.	Which average is affective observations?	ected	most by extreme	
	(a) mode	(b)	median	
	(c) geometric mean	(d)	harmonic mean	
4.	The sum of deviations ta is ———	ken f	from arithmetic mean	
	(a) minimum	(b)	zero	
	(c) maximum	(d)	none	
5.	Ideal measures of dispersion is			
	(a) Range	(b)	Quartile deviation	
	(c) Mean deviation	(d)	Standard deviation	
6.	Variance =			
	(a) $\sigma$	(b)	$\sigma^2$	
	(c) $\sqrt{\sigma}$	(d)	$2\sigma$	
7.	If two variables are correlation coefficient is	unco	rrelated, then their	
	(a) 0	(b)	1	
	(c) -1	(d)	±1	
8.	If $\Sigma d^2 = 20, n = 5, t$ correlation	hen	coefficient of rank	
	(a) 0	(b)	1	
	(c) -1	(d)	±1	
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9. If 4 and  $\frac{1}{8}$  are regression coefficients, then coefficient of correlation is —

(a) 
$$\frac{1}{2}$$
 (b)  $\frac{1}{\sqrt{2}}$   
(c)  $-\frac{1}{2}$  (d)  $\frac{1}{4}$ 

- 10. If 3x + 2y = 26, 6x + y = 31 are regression lines, then  $\overline{x}$  and  $\overline{y}$  respectively are —
  - (a) 4, 7 (b) 7, 4
  - (c) 5, 6 (d) 6, 5

PART B —  $(5 \times 5 = 25 \text{ marks})$ 

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Write the objectives of classification.

Or

(b) The data given below gives the yearly profits of two companies A and B. Represent the data by means of a suitable bar diagram.

	Profit		
Year	А	В	
2005	10000	15000	
2006	8000	13000	
2007	13000	14000	

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12. (a) Find the median for the following frequency table.

(b) Find the Harmonic mean for the following table.

Class 0-10 10-20 20-30 30-40 40-50

Frequency 15 10 7 5 3

13. (a) Show that the variance of first *n* natural numbers is  $\frac{1}{12}(n^2-1)$ .

### Or

- (b) Find the quartile deviation of 40, 90, 61, 68, 72, 43, 50, 84, 75, 33.
- 14. (a) Compute the coefficient of correlation between X and Y for the following data.

Or

(b) Calculate the rank correlation coefficient for the following data. P 35 5644 2650653815Q 50 3570 25 45 585560

Page 4 Code No. : 30355 E [P.T.O] 15. (a) If the two lines of regression are 3x+2y-26=0 and 6x+y-31=0, find the correlation between the values of *x* and *y*.

Or

(b) If  $\theta$  is the acute angle between the two regression lines then show that  $\tan \theta \leq \frac{1-\gamma^2}{2\gamma}$ .

PART C —  $(5 \times 8 = 40 \text{ marks})$ 

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write the types of classification with examples.

Or

(b) Represent the following data by a Pie diagram.

	Expenditure	
Items	in Rs.	
Food	87	
Cloth	24	
Education	13	
Rent	25	
Recreation	11	
Miscellaneous	20	

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Find the A.M. and G.M. for the following 17. (a) data. Marks : 20-30 30-40 0-10 10-20 4

No. of students : 3  $\mathbf{5}$ 8

## $\mathbf{Or}$

Find the mode for the following data. (b)

Marks	No. of students
0-9	6
10-19	29
20-29	87
30-39	181
40-49	247
50-59	263
60-69	133
70-79	43
80-89	9
90-99	2

#### 18. Find the standard deviation for the following (a) data.

Marks :  $10 \ 9$ 8 76  $\mathbf{5}$ 4 3  $\mathbf{2}$ 1  $Frequency: \ 1 \ \ 5 \ \ 11 \ \ 15 \ \ 12 \ \ 7 \ \ 3 \ \ 3 \ \ 0 \ \ 1$ 

Or

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(b) Find the quartile deviation for the following data. Class: 11-15 16-20 21-25 26-30 31-35 Frequency : 8 1539 475236-40 41-45 46-50 51-55 Class : Frequency: 41 28164 19. (a) Find the correlation coefficient for the data given below.

 $51 \ 63 \ 63$ 49 x:5060 6563 46 50y: 4972 50 48 60 704860 7556Or

(b) From the following data of marks obtained by 10 students in mathematics and chemistry. Calculate the rank correlation coefficient.

Mathematics (M): 35 56 50 65 44 38 44 50 15 26

Chemistry (C) : 50 35 70 25 35 58 75 60 55 35

20.(a) Obtain the lines of regression for the following data. A: 25 28 30 323536 38394245B:20 26 2930 25 2618 3535 46

 $\mathbf{Or}$ 

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(b) Given that x = 4y + 5 and y = kx + 4 are the regression lines x on y and y on x respectively, show that  $0 \le k \le 1/4$ . If  $k = \frac{1}{16}$ , find  $\overline{x}$ ,  $\overline{y}$  and  $\gamma$ .

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