

# INDIAN MARITIME UNIVERSITY

(A Central University established by an Act of Parliament in 2008)

End Semester Examinations December 2017

## SEMESTER II QUANTITATIVE TECHNIQUES FOR BUSINESS (PG21T2201/PG22T2201)

Date: 04.12.2017

Time: 3 hours

Max. Marks:60

Pass Marks: 30

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### Part- A

(12×1=12 Marks)

Answer all questions. All questions carry equal marks

1. Which among the following averages is affected by extreme values of the series?
  - a. Mode
  - b. Median
  - c. Mean
  - d. Geometric mean
2. Graph of cumulative frequency of a distribution
  - a. Ogive
  - b. Lorenz curve
  - c. Pie chart
  - d. Bar chart
3. Sum of values of a given year divided by the sum of values of the base year
  - a. Value index
  - b. Price index
  - c. Consumer price index
  - d. Cost of living index
4. Which among the following is not a discrete distribution?
  - a. Binomial distribution
  - b. Poisson distribution
  - c. Normal distribution
  - d. None of the above
5. Which among the following is used to show the variability or dispersion of the quality of items of a given production process?
  - a. R chart
  - b. P chart

- c. C chart
  - d. None of the above
6. Standard deviation of the sampling distribution is called .....
- a. Probable error
  - b. Standard error
  - c. Coefficient of variation
  - d. None of the above
7. Measure of the average relationship between two or more variables in terms of the original units of the data
- a. Correlation
  - b. Regression
  - c. Standard deviation
  - d. None of the above
8. Which among the following is the average of Laspeyer's and Paasche's Indices
- a. Fisher's Index
  - b. Dorbish and Bowley's Method
  - c. Marshall Edgeworth Method
  - d. Kelly's method
9. A statistical technique that assesses potential differences in a scale-level dependent variable by a nominal-level variable having 2 or more categories.
- a. ANOVA
  - b. T test
  - c. Chi square test
  - d. Correlation
10. In a standard normal distribution, the value of mean is .....
- a. 1
  - b. 0
  - c. -1
  - d. None of the above
11. The coefficient of correlation ranges between .....
- a. 0 and 1
  - b. -1 and 1
  - c. -1 and 0
  - d. none of the above
12. Under linear programming the function to be maximised or minimised is called.....
- a. Objective function
  - b. Feasible function
  - c. Infeasible function
  - d. None of the above

**Part-B**

(5×4=20 Marks)

(Answer any FIVE questions not exceeding 200 words. All questions carry equal marks)

13. A pottery company's products and resources are shown below in a table. Formulate a linear programming problem and find how many bowls and mugs should be produced to maximise profits subject to labor and material constraints (use graphical method)

Product	Labour	Clay	Profit (Rs)
Bowl	1	4	40
Mug	2	3	50
Total	40	120	Z

14. Find the dual of the following linear programming problem

$$\text{Minimise } C = 14y_1 + 40y_2 + 18y_3$$

$$\text{Subject to } 2y_1 + 5y_2 + y_3 \geq 50$$

$$y_1 + 5y_2 + 3y_3 \geq 30$$

$$y_1, y_2, y_3 \geq 0$$

15. What is queuing theory? Explain its advantages.

16. Define sampling. Explain the different methods of sampling.

17. Explain the various components of a time series.

18. Give a short description about the framework adopted by PERT and CPM under network analysis

19. The number of workers employed, the mean wage (in Rs.) per month and standard deviation (in Rs.) in each section of a factory are given below. Calculate the mean wages and standard deviation of all the workers taken together.

Section	No. of workers employed	Mean wages (Rs.)	Standard deviation (Rs.)
A	50	1113	60
B	60	1120	70
C	90	1115	80

**Part-C**

(4×7=28 Marks)

Answer question no. 20 (compulsory) and any 3 (three) from the rest

20. Following are the marks obtained by two students A and B in 10 sets of examinations:

Sets	1	2	3	4	5	6	7	8	9	10
Marks of A	44	80	76	48	52	72	68	56	60	64
Marks of B	48	75	54	60	63	69	72	51	57	56

If the consistency of performance is the criterion for awarding the prize, who should get the prize?

21. Find the correlation coefficient between age and playing habits of the following students:

Age (years)	No. of students	Regular players
15	250	200
16	200	150
17	150	90
18	120	48
19	100	30
20	80	12

Also calculate probable error of coefficient of correlation. Is the correlation coefficient significant?

22. Calculate Spearman's coefficient of correlation between marks assigned to ten students by judges X and Y in a certain competitive test as shown below:

Marks by judges	1	2	3	4	5	6	7	8	9	10
X	52	53	42	60	45	41	37	38	25	27
Y	65	68	43	38	77	48	35	30	25	50

23. Compute Laspeyer's, Paasche's, Fishers and Marshall- Edgeworth's Index Numbers from the following data

Item	Base Year		Current Year	
	Price (Rs)	Quantity	Price (Rs)	Quantity
A	5	25	6	30
B	3	8	4	10
C	2	10	3	8
D	10	4	3	5

24. In a bolt factory machines A, B and C manufacture respectively 25%, 35% and 40%. Of the total of their output 5, 4 and 2 per cent are defective bolts. A bolt is drawn at random from the product and is found to be defective. What are the probabilities that it was manufactured by machines A, B and C?

25. From the following data calculate regression equations

X	6	2	10	4	8
Y	9	11	5	8	7

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