

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – June 2023
Programme Name: MBA(ITL)/MBA(PSM)
Semester: II
Subject Code: PG22T2201
Subject Name: Quantitative Techniques for Business

Date: 05.06.2023

Max Marks: 60

Duration: 03 Hrs

Pass Marks: 30

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) Options, if any, are specified in respective section.

Section A

Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable.

1. A jar of pickles is picked at random using a filling process in which an automatic machine is filling pickle jars with 2.5 kg of pickles in each jar. Due to a few faults in the automatic process, the weight of a jar could vary from jar to jar in the range of 1.7 kg to 2.9 kg excluding the latter. Let X denote the weight of a jar of pickles selected. Find the range of X .
 - a. $1.7 < X < 2.9$
 - b. $1.7 \leq X \leq 2.9$
 - c. $1.7 \leq X < 2.9$
 - d. $1.7 < X \leq 2.9$

2. In simplex method, artificial variables are used when
 - a. The constraints are of (\leq) type
 - b. The constraints are of (\geq) type
 - c. The constraints are of ($=$) type
 - d. The constraints are of ($=$) and/or (\geq) type

3. A _____ probability is the probability that an event will occur given that another event has already occurred.
- subjective
 - objective
 - conditional
 - binomial
4. Random numbers are used:
- To describe the uncertainty of input values
 - To give random outcomes
 - To assign values to the parameters
 - To change the problem solution
5. The equation of a straight line is $2x+3y=6$. Which of the following is true of the intercept and slope of this line?
- Intercept = 6, slope = $2/3$
 - Intercept = 2, slope = $-2/3$
 - Intercept = 6, slope = $-2/3$
 - Intercept = 3, slope = $-2/3$
6. For a set of 25 unequal values, the largest value is doubled. This would
- Change its mean and median value both.
 - Change its mean but not affect the median value.
 - Not affect the mean but would change the median value.
 - Not affect either mean or median.
7. The correlation coefficient denotes _____.
- the degree of association between two variables
 - a non-linear relationship between two variables
 - a linear relationship between two variables
 - the differences between the two variables
8. All possible solutions which can be worked upon under given constraints are
- Optimum solution
 - Feasible solution
 - Initial solution
 - None of the above

9. Joining the other queue and leaving the first one is called
- Jockeying
 - Reneging
 - Balking
 - None of the above
10. Mark the incorrect statement.
- The chi-square variable is defined as the ratio of the product of the variance of a sample and its degrees of freedom to the population variance.
 - A chi-square distribution is always positively skewed.
 - A chi-square distribution is a continuous sampling distribution.
 - The lower bound of chi-square variable is equal to 1.

Section B

Five Questions of 02 Marks each

- What are ogives?
- Define null and alternative hypothesis
- Define Total time in the queuing system
- What is standard error?
- Define Degeneracy in a LPP

Section C

Seven Questions of 08 Marks each of which any 05 questions to be answered.

16. A survey on MBA students provided the following data for 2,018 students:

<i>Age group</i>		<i>Whether applied to more than one school</i>	
		<i>Yes</i>	<i>No</i>
23 under	or	207	201

24 – 26	209	379
27 – 30	185	268
31 – 35	66	193
36 and over	51	169

- (a) What is the probability that a randomly selected applicant is 23 or under?
- (b) What is the probability that a randomly selected applicant is older than 26?
- (c) What is the probability that a randomly selected applicant applied to more than one school?
- (d) What is the probability that a randomly selected applicant is above 36 and has not applied to more than one school? (2+2+2+2=8)

17.(a) Consider the following table and find out the rank correlation.

Student	Mathematics	English
Ravi	35	24
Raju	20	35
Suman	49	39
Vidisha	44	48
Arun	30	45

- (b) Calculate standard deviations for the respective subjects. (4+4=8)

18.(a) State with an example the advantages of the probability distribution.

Discuss briefly discrete and continuous probability distribution functions.

- (b) A bag contains 20 balls marked 1 to 20. One ball is drawn at random. What is the probability that the ball is marked with a number multiple of 5 or 7? (4+4=8)

19.Solve the following problem using simplex method:

Maximise $7x_1 + 14x_2$
Subject to the constraints

$$\begin{aligned} 3x_1 + 2x_2 &\leq 36 \\ x_1 + 4x_2 &\leq 10 \\ x_1, x_2 &\geq 0 \end{aligned}$$

8

20.What kind of decision-making situations may be analysed using PERT and CPM techniques? State the differences between PERT and CPM. (2+6=8)

21. What is simulation? State the reasons for using simulation to solve a problem. What are the advantages and limitations of simulation? (2+2+4=8)

22. Elaborate the concept of stratified sampling. What are the advantages and the disadvantages of stratified sampling? (4+4=8)

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