1C)

the poverty line is entitled to ration at subsidized rates each month. The initial study comprised a single employee at each distribution center for modeling the simulation and had to follow a checklist while serving ration to customers' The time taken by the employee to follow the checklist for serving a citizen follows a Uniform distribution of U (7, 15) minutes. The inter-arrival time of the citizens at the distribution centre follows a uniform distribution of U (5, 22) minutes. Simulate the scenario for the arrival of 10 citizens at the distribution centers. Use same random numbers for both arrival and service.

https://manipal.examcloud.in/reports/exam-qpaper.php

the mean was 4.

SIMULATIC

Answer all the questions.

- 1A) Nonstop buses run from Mysore to Bangalore every 30 minutes between 5.30 AM and 9.30 AM. If a person lands up on this platform of the bus stand during the running period of nonstop busses to commute his journey to Bangalore, what is the probability (4) that he will have to wait for at least 20 minutes?
- 1B) Company manufacturing washing machines establishes a fact that there is a relationship between the sale of washing machines and the population of the city. The market research reveals the following information in the table below. Fit a regression equation and estimate the demand for washing machines for 2024 if the likely population is 120 million.

Year	2018	2019	2020	2021	2022	2023
Population	20	29	45	62	78	100
(millions)						
Number of	48	68	88	100	130	160
washing						
machines sold						
(in thousands)						

An electronic sensor evaluates the quality of memory chips, rejecting those that fail. Upon demand, the sensor will give the minimum and maximum number of rejects during each hour of production over the past 24 hours. Without further information, the

approximated by a triangular distribution. The current dump of data indicates that the minimum number of rejected chips during any hour was 0, the maximum was 10, and

quality control department has assumed that the number of rejected chips can be

MANIPAL ACADEMY OF HIGHER EDUCATION

DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING END SEMESTER EXAMINATION- NOV/DEC 2023 SEMESTER D TECH (INDUSTRIAL AND PRODUCTION ENCC.) 2018 CURRICHLUM

V SEMESTER B.TECH. (INDUSTRIAL AND PRODUCTION ENGG.) - 2018 CURRICULUM

SIMULATION MODELING AND ANALYSIS [MME 3157]

END EXAM





Duration: 180 mins.

Section Duration: 180 mins

Section Duration: 180 mins

(3)

(3)

MME 3157

	60, 94, 7, 20, 24, 17, 86, 82, 49, 43, 61, 79	
	a) What is the expected time between arrivals for 10 citizens?	
	b) what is the expected service time for 10 citizens?	
	c) what is the average time of a citizen in the system?	
2B)	Explain the methods of identifying the probability distribution of the collected data in the development of a data model for simulation.	(3)
2C)	List the components of a system and explain. Give examples.	(2)
3A)	Use the Kolmogorov-Smirnov test to verify whether the following data follows exponential distribution or not. The data given are: 0.54, 0.88, 0.17, 0.12, 0.95.	(5)
3B)	Sketch and explain the process of calibration and validation of a simulated model.	(3)
3C)	Explain the time keeping mechanisms used in a simulation modeling and analysis system.	(2)
4A)	Simulation results for the four alternative scheduling procedures of a flexible manufacturing system are given below. Check, if there is any difference in production rates.	

Procedure	Mean production rate	SD	Frequency
1	26.08	3.39	10
2	24.69	4.43	10
3	29.95	2.85	10
4	33.84	4.83	10

(4)

4B)	Explain the various methods used to generate random numbers with examples.	(3)
4C)	What are the steps used in performing the chi-square test? Explain.	(3)
5A)	In a certain factory turning out razor blades there is a small probability of 1/400 for any blade to be defective. The blades are supplied in a packets of 12. Use poisson distribution to calculate the approximate number of packets containing i) No defectives ii) One defective iii) Two defective blades iv) Three defective blades in a consignment of 15,000 packets.	(5)
5B)	List and explain the guidelines to be followed during the data collection stage of input modeling a discrete event system.	(3)
5C)	In a sampling of a large number of parts manufactured by a machine, the mean number of defectives in a sample of 30 is 3. Out of 1500 such samples, how many would be expected to contain	(2)

a) At least 4 defective parts?

b) At most 3 defective parts?

-----End-----