

**PGDM (IB), 2020-22**

**Business Analytics**

**IB-201**

**Trimester – II, End-Term Examination: January 2021**

Time allowed: 2 hrs 30 min

Max Marks: 50

Roll No: \_\_\_\_\_

**Instruction:** Students are required to write Roll No on every page of the question paper, writing anything except the Roll No will be treated as **Unfair Means**. In case of rough work please use answer sheet.

**Section – A**

SECTION A – (10 marks \* 3 questions) = 30 Marks

A1a. What do you mean by a mathematical model of real life situation? Discuss the importance of models in the solution of optimization problems. (CILO 1)

OR

A1b. The product is a home ventilation fan distributed by Electrical Supply Company (ESC). Each fan costs the company \$80 and sells \$120. Monthly demand for the fan is described by normal probability distribution with mean 80 and standard deviation of 20.

ESC receives monthly deliveries from its supplier and replenishes its inventory to a level of 100 at the beginning of each month. The beginning inventory level is referred to as the replenishment level. If monthly demand is less than the replenishment level, an inventory holding cost of \$15 is charged for each unit that is not sold. However, if monthly demand is greater than the replenishment level, a stock out occurs and a shortage cost is incurred which is \$30 for each unit of demand that cannot be satisfied.

Use a simulation model to determine the average monthly net profit with at least 30 runs.

A2a. What are the assumptions of linear programming? Explain with the help of examples. (CILO2)

OR

A2b. Why analytics is important for business? What are the difference between analytics and analysis? What are the issue in data analysis?

A3a. An organization was investigating relocation its corporate headquarters to one of the three possible cities. The pair wise comparison matrix shows the president's judgment regarding the desirability for the three cities.

	City 1	City 2	City 3
City 1	1	5	7
City 2	1/5	1	3
City 3	1/7	1/3	1

Determine the priorities for the three cities. Is the President consistent in terms of the judgment provided? Explain. (CILO 3)

OR

A3b. Jewel of Nizam is a Mughlai fine dining chain of restaurants head-quartered in New Delhi. It has opened its first restaurant outside Delhi in Hyderabad considering the city's importance in Mughlai cuisine. It is situated in Banjara Hills an up market locality which is famous for its hotels, swanky restaurants and big shopping malls. Many restaurants have recently come up here which offer cuisines from all over the world to their customers. In recent times there has been major man power planning problems which had an adverse impact on customer service at the restaurant. Mr. Nikhil Bansal is the floor manager of the restaurant and he is perplexed with the problem. To solve this problem, he has collected data of the number of workers needed on a particular day from the past experience which is as follows: -

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Number	14	13	15	16	19	18	11

Restaurant rules require every worker to work for five consecutive days and then takes two days off, repeating this pattern indefinitely. Develop a model that should provide the optimal number of employees to manage the restaurant?

### Section - B

#### Compulsory Case Study (20 Marks)

(CILO 1,2 and 3)

The Ranch House, Inc., operates five fast-food restaurants. Input measures for the restaurants include weekly hours of operation, full-time equivalent staff, and weekly supply expenses. Output measures of performance include average weekly contribution to profit, market share, and annual growth rate. Data for the input and output measures are shown in the following table.

Restaurant	Hours of Operation	FTE Staff	Weekly Profit	FTE Staff (%)	Growth Rate (%)	Supplies (\$)
Bardstown	96	16	\$3800	25	8.0	850
Clarksville	110	22	\$4600	32	8.5	1400
Jeffersonville	100	18	\$4400	35	8.0	1200
New Albany	125	25	\$6500	30	10.0	1500
St. Matthews	120	24	\$6000	28	9.0	1600

- Develop a linear programming model that can be used to evaluate the performance of the Clarksville Ranch house restaurant.
- Solve the model.
- Is the Clarksville ranch House restaurant relatively inefficient? Discuss.