UNIVERSITY OF ESWATINI

FACULTY OF COMMERCE

DEPARMENT OF BUSINESS ADMINISTRATION

FINAL EXAMINATION PAPER; MBA

APRIL 2021

TITLE OF PAPER : STRATEGIC OPERATIONS & ADVANCED SIMULATION

COURSE CODE : BUS655

TIME ALLOCATED : THREE [3] HOURS

INSTRUCTIONS

1. TOTAL NUMBER OF QUESTIONS IN THIS PAPER IS 5
2. THE PAPER CONSISTS OF SECTION A AND SECTION B
3. ANSWER SECTION A WHICH IS COMPULSORY AND ANY THREE [3] QUESTIONS OF YOUR CHOICE IN SECTION B.
4. THE MARKS ALLOCATED FOR A QUESTION OR PART OF A QUESTION ARE INDICATED AT THE END OF EACH QUESTION OR PART OF THE QUESTION.
5. NOTE: MAXIMUM MARKS WILL BE AWARDED FOR QUALITY, LAYOUT, ACCURACY, AND EXPLANATIONS FOR STEPS USED TO SOLVE PROBLEMS

THIS PAPER MUST NOT BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATOR.

SECTION A: CASE STUDY. FORECASTING AND REGRESSION ANALYSIS

With the growth of The Rock Restaurants- from one restaurant in Siteki, in Eswatini in 2010 to more than 100 outlets in Southern Africa Region in 2020 came a corporate wide demand for better forecasting. The Rock uses long term forecasting in setting a capacity plan and intermediate term forecasting for locking in contracts for staff uniform and food items such as beef, chicken and, pork. Its short term forecasts are conducted each month, by restaurant, and then aggregated for a headquarters view.

The heart of the forecasting system is the point- of- sale system (POS), which, in effect, captures transaction data on nearly every person who walks through a restaurant door. The sale of each entrée represents one customer; the entrée data are transmitted daily to the Manzini corporate headquarters' database. There, the financial team, headed by Vusi, begins the forecast process. Vusi forecasts monthly guest counts, retail sales, banquet sales, and concert sales(if applicable) at each restaurant. The general managers of individual restaurants tap into the same database to prepare a daily forecast for their sites. A restaurant manager pulls up prior years' sales for that day, adding information from the local Chamber of Commerce or Tourism Authority on upcoming events such as a major convention, sporting event, or concert in the city where a restaurant is located. The daily forecast is further broken down into hourly sales, which drives employee scheduling. Hourly forecasts of R5, 500 in sales translates into 19 workstations, which are further broken down into a specific number of wait staff, hosts, bartenders*[The Hungarian method is used to assign staff to workstations-see Table2).* Computerised scheduling software plugs people base on their availability. Variances between forecasts and actual sales are then examined to see why errors occurred.

The Rock Restaurant does not limit its use of forecasting tools to sales. To evaluate managers and set bonuses, a 3-year weighted moving average is applied for restaurant sales. If restaurant general managers exceed their targets a bonus is computed. Vusi, at corporate headquarters, applies weights of 40% to the most recent year's sales, 30% to the year before, and 20% to sales 2 years ago in reaching his moving average. An even more sophisticated application of statistics is found in The Rock Restaurant's menu planning. Using multiple regression, managers can compute the impact on demand of other menu items if the price of one item changed. For example, if the price of cheeseburger increases fromR17, 99 to R18.99,The Rock can predict the effect this will have on sales of chicken sandwiches, pork sandwiches, and salads. Managers do the same analysis on menu placement, with the centre section driving higher sales volumes. When an item such as hamburger is moved off the centre to one of the side flaps, the corresponding effect on related items, say French fries, is determined. Now, study the following data sets and try to make sense out of them.

Table 1. The Rock's Mbombela Restaurant's Sales and Advertising Cost Data

Month	**1 2 3 4 5 6 7 8 9 10**
Guest count (000)	21 24 27 32 29 37 43 43 54 66
Advertising (R000)	14 17 25 25 35 35 45 50 60 60

***The figures are hypothetical for this study only**

Table 2: Monthly Supervisor's assignment costs at The Rock's Mbombela Restaurant (R000)

Workstation Staff	Wait	Hosts	Bartender	Kitchen
Alfred	R40	R50	R60	R65
Beauty	80	60	75	75
Catherine	65	70	75	55
David	50	45	70	60

Case study questions

i. Briefly discuss the qualitative forecasting strategies which The Rock Restaurant could have used instead of using the quantitative forecasting techniques **(10 marks)**

ii. At The Rock's Mbombela restaurant the manager is trying to minimize the cost of supervising four working stations wait staff, hosts, bartender and kitchen. Available supervisors (Alfred, Beauty, Catherine and David) and their costs when assigned to the respective workstations are shown in Table 2. For example, assigning Beauty to the bar costs R75 while assigning Alfred to hosts cost R50. Use the Hungarian method to assign the four supervisors to the different workstations ensuring each supervisor is assigned to only one workstation. The four supervisors have worked in all the four sections in the past, courtesy of the company's staff rotation strategy **(10 marks)**

iii. The Rock restaurant manager is trying to evaluate how a new advertising campaign affects guest counts. Using data for the past ten months(Table 1)

   a. Draw a scatter diagram and explain the relationship between advertising cost and guest count **(5 marks)**

   b. Use regression analysis to forecast the expected guest count when advertising coast is R65,000 **(15 marks)**

[TOTAL 40 MARKS

SECTION B: ANSWER THREE (3) QUESTIONS OF YOUR CHOICE

QUESTION 2.

Patronella bakery maintains sufficient stocks of its **'Petit Delight Cake'** and the daily demand is as follows:

Daily demand	0	10	20	30	40	50	60	70	80
Probability	.02	.16	.23	.15	.13	.12	.10	.06	.03

Random Numbers	36	29	84	57	19	79	46	67	08	81	87	94

i. Using the above sequence of random numbers simulate the demand for the next 12 days (6 marks)

ii. Calculate the daily average demand for the cakes (4 marks)

iii. If the proprietor of the bakery decides to make 40 cakes every day, calculate the stock position at the end of the 12^{th} day (10 marks)

[TOTAL 20 MARKS]

QUESTION 3.

Perform an operations effectiveness analysis using the Ishikawa diagram. Use a hypothetical organisation or the company you work for **[TOTAL 20 MARKS]**

QUESTION 4

How and where can you apply the following operations management concepts

a. ABC analysis in inventory management (8 marks)

b. Project risk mitigation strategies (8 marks)

c. Servitisation (4 marks)

[TOTAL 20 MARKS]

QUESTION 5.

The following activities have been identified for Mandla Dlamini Manufacturing's product development project.

Activity	Predecessor	Optimistic time	Most likely time	Pessimistic time
A	--	6	9	12
B	A	6	8	10
C	A	3	7	11
D	B	12	16	20
E	C	6	11	22
F	D	12	15	24
G	E	5	7	15
H	F,G	4	8	12

i. Explain the three(3) times used in PERT analysis (6 marks)

ii. Draw the project network with all the activities (4 marks)

iii. Determine the critical path and the expected completion time of the project (10 marks)

[TOTAL 20 MARKS]

END OF EXAMINATION: GOOD LUCK!!!!!