REVIEW QUESTIONS: OPERATIONS MANAGEMENT

UNIT I: Introduction to Operations Management

1. Identify the three major functional areas of business organisations and briefly describe how they interrelate.
2. Explain the term value-added.
3. List five important differences between goods production and service operations, then list five important similarities.
4. Discuss the various impacts of outsourcing.
5. What are the various decisions Operations Managers are called upon to make in the manufacturing and service industries for the various operational areas under his responsibility. Give suitable examples in each area.
6. Discuss how organisations can achieve competitive advantage through the operations function. Support your answer by appropriate examples in the business context.

UNIT II: Competitiveness, Strategy and Productivity

7. List some factors that can affect productivity and some ways that productivity can be improved.
8. List 10 ways that commercial banks compete for customers.
9. In order to stay competitive, organisations need to embrace the productivity challenge. Comment on the factors that affect productivity.
10. In any organisation the factors that define customer requirements are referred to as competitive factors which are influenced by the operations function at the performance objectives. Explain using examples, the different types of performance objectives in a particular industry of your choice.
11. Critically discuss the following requirements from an operations perspective of competing on
    i. quality
    ii. cost
    iii. flexibility
    iv. dependability
    v. speed

    Support your answer using relevant examples either from the manufacturing or service firms.

UNIT III: Forecasting

12. Two different forecasting techniques (F1 and F2) were used to forecast demand for cases of bottled water. Actual demand and the two sets of forecasts are as follows:

		PREDICTED DEMAND	
Period	**Demand**	**F1**	**F2**
1	68	66	66
2	75	68	68
3	70	72	70
4	74	71	72
5	69	72	74
6	72	70	76
7	80	71	78
8	78	74	80

    a. Compute MAD for each set of forecasts. Given your results, which forecast appears to be more accurate? Explain.
    b. Compute the MSE for each set of forecasts. Given your results, which forecast appears to be more accurate?
    c. In practice, either MAD or MSE would be employed to compute forecast errors. What factors might lead a manager to choose one rather than the other?
    d. Compute MAPE for each data set. Which forecast appears to be more accurate?

13. Discuss the problems which can be caused by poor forecasting of demand.

14. Explain briefly the various forecasting techniques used in management highlighting their advantages and disadvantages.

15. Explain the meaning of forecasting. Support your answer by means of appropriate examples in the business context.

16. The table below shows the temperature (degrees C), at 11 p.m, over the last ten days:

Day	1	2	3	4	5	6	7	8	9	10
Temperature	1.5	2.3	3.7	3.0	1.4	-1.3	-2.4	-3.5	-0.5	1.3

a. Calculate a three- day moving average for each day.

b. What would be your forecast for the temperature at 11 p.m on day 11?

c. Apply exponential smoothing with a smoothing constant of 0.8 to derive a forecast for the temperature at 11 p.m on day 11.

d. Which of the two forecasts for the temperature at 11 p.m on day 11 do you prefer and why?

17. Two independent methods of forecasting based on judgment and experience have been prepared each month for the past 10 months. The forecasts and actual sales are as follows:

Month	**Sales**	**Forecast 1**	**Forecast 2**
1	770	771	769
2	789	785	787
3	794	790	792
4	780	784	798
5	768	770	774
6	772	768	770
7	760	761	759
8	775	771	775
9	786	784	788
10	790	788	788

Compute the MSE, MAD and MAPE for each forecast.

18. An electrical contractor's records during the last five weeks indicate the number of job requests:

Week:	1	2	3	4	5
Requests:	20	22	18	21	22

Predict the number of requests for week 6 using each of these methods:

i. A four-period moving average

ii. Exponential smoothing with a smoothing constant of **0.30** and **0.60** respectively. Use **20** for **week 2** forecast.

19. The following data were collected in 2015 during a study based on the impact of advertising expenditure on turnover for Pac Store:

Advertising Expense ($)	**Sales ($)**
100	1,500
150	1,560
180	1,610
220	1,655
270	1,685

(i) Plot the data. Comment on the relationship of the two variables.

(ii) Obtain a linear regression line for the data.

(iii) Compute the correlation coefficient and coefficient of determination. Comment on the results.

(iv) Predict the sales of Pac Store when the advertising expense is $155 and $360. Comment on its reliability.

20. The following data were collected during a study of consumer buying patterns.

Observations	x	y	Observations	x	y
1	15	74	8	18	78
2	25	80	9	14	70
3	40	84	10	15	72
4	32	81	11	22	85
5	51	96	12	24	88
6	47	95	13	33	90
7	30	83			

a. Plot the data.

b. Obtain a linear regression line for the data.

c. What percentage of the variation is explained by the regression line?

d. Use the equation determined in **part b** to predict the value of y for x = 41 and x = 52. Comment on its reliability.

UNIT IV: Product and Service Design

21. Suppose you wish to see on the Mauritian market a new or revised product or service or from the company where you currently work. Discuss the implications of producing that product or service relative to legal, ethical, environmental, profitability, competitive, design, and production issues.

22. What are six factors that cause organisations to redesign their products or services?

23. What is the main objective of value analysis?

24. How has technology had an impact on product and service design?

UNIT V: Strategic Capacity Planning

25. The data in the following table represents the demand forecast for the 12 months of 2015. Axis Co. Ltd currently employs 50 employees. Each employee produces 100 units a month. The cost of hiring an additional employee is $500 and the cost of making an employee redundant is $200. A storage charge of $10 per unit is made for inventory on hand at the end of each month.

    Prepare a production plan using **chase capacity strategy**.

Month	Demand forecast
Jan	5400
Feb	4800
Mar	6000
Apr	5000
May	4800
Jun	5400
Jul	6400
Aug	5000
Sep	6200
Oct	5400
Nov	4400
Dec	5600

26. An entrepreneur producing different types of vegetable pickle is now considering the addition of a new plant. The primary location being considered will have fixed costs of $9,200 per month and variable costs of 70 cents per unit produced. Each item is sold to retailers at a price that averages 90 cents.
    a) What volume per month is required in order to break even?
    b) What profit would be realised on a monthly volume of 61,000 units?
    c) What volume is needed to obtain a profit of $16,000 per month?

27. The Ironblast Co. Ltd intends to increase the capacity of a bottleneck operation by adding a new machine. Two alternatives A and B have been identified and the associated costs and revenues have been estimated. The cost of the new machine including its installation for alternative A is $40,000 whereas for alternative B the cost amounted to $30,000; variable costs per unit would be $ 10 for A and $11 for B; and revenue per unit would be $15.

    (i) Determine each alternative's breakeven point in units and $?
    (ii) At what volume of output would the two alternatives yield the same profit? Find the value of this profit?
    (iii) If expected annual demand is 12,000 units, which alternative would yield the higher profit?

28. How do capacity decisions influence productivity?

29. Why is it important to adopt a big-picture approach to capacity planning?

30. HT Computer Repair Service Company Ltd has a design capacity of 80 repairs per day. Its effective capacity, however, is 64 repairs per day (80% of its design capacity). Its actual capacity is 62 repairs per day (78% of its design capacity). The operations manager intends to increase the numbers of repairs per day. Which of the following factors would you recommend that the manager investigate: quality problems, absenteeism, or scheduling and balancing? Justify your reasoning.