



FACULTY/COLLEGE	College of Business and Economics
SCHOOL	School of Economics
DEPARTMENT	TSCM
CAMPUS(ES)	APB
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SEMESTER	Second
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ASSESSOR(S)	Ms Hemisha Makan		
MODERATOR(S)	Prof Richard Chinomona		
DURATION	3 hours (180 min)	TOTAL MARKS	100

NUMBER OF PAGES OF QUESTION PAPER (Including cover page)	12
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INFORMATION/INSTRUCTIONS:

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- This is a closed-book assessment.
  - Please answer all questions in the answered book provided
  - Read the questions carefully and answer only what is required.
  - Write neatly and legibly
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## **SECTION A – MULTI-CHOICE QUESTIONS**

**[30 MARKS]**

- 1. Cross-dock operations are particularly suited for operations that ...**
  - a. Keep no inventory.
  - b. Cannot get the suppliers to deliver the correct quantity.
  - c. Have a severe restriction of space.
  - d. Want goods to be delivered to the facility without delays.
  - e. Use a third-party truck that is delivering goods to the area.
- 2. Logistics facilities where goods are handled are given different names where the focus of the operation is different. Which of these is not a particular type of facility?**
  - a. DC
  - b. Manufacturing warehouse
  - c. Cross-dock
  - d. Buffer stock facility
  - e. None of these
- 3. Replenishment cycle refers to:**
  - a. Order processing
  - b. Order placement
  - c. Acquisition of additional inventory
  - d. Lead time
  - e. Cycle time
- 4. The first industrial revolution was characterised by:**
  - a. The use of water and steam power which was used to mechanize production during the 1800's
  - b. The use of electric power that led to industrialization and mass production.
  - c. Digitalization whereby electronics and information technology was used to automate production.
  - d. Digital revolution triggered by the development of Information and Communication Technologies (ICT).
  - e. None of the above
- 5. The fourth industrial revolution includes:**
  - a. creation of a digitized system
  - b. network integration utilising smart systems
  - c. simplified working environment
  - d. automated processes
  - e. all of the above

- 6. Facilities handling goods have three principles that show or define the efficiency of the operation. Which is not one of these?**
- a. Goods are never at rest other than in long-term storage and dispatch areas
  - b. The location of goods is always correct in the system of record
  - c. People are trained to perform the work correctly every time
  - d. Goods are never at rest other than in long-term storage or dispatch areas
  - e. The system of record is corrected each night
- 7. Supply chain management in industry 4.0 will:**
- a. Interchanges traditional relations amongst supply chains link to a network of connection whereby data are gathered in disseminated servers
  - b. Become an extended supply chain
  - c. Include supply chain processes that are manual
  - d. All of the above
  - e. None of the above
- 8. Order processing includes:**
- a. Checking customer credit
  - b. Transferring information to sales records
  - c. Sending order to the inventory and shipping areas
  - d. Preparing shipping documents
  - e. All of the above
- 9. Order management systems represent the principle means by which:**
- a. Buyers and sellers communicate information relating to individual orders of product
  - b. Buyers places order
  - c. Logistics operation begins
  - d. Seller places the order
  - e. Management initiate selling process
- 10. Which of the following statements is correct?**
- a. One-way packaging is always more advantageous than reusable packaging
  - b. Reusable packaging is always more advantageous than one-way packaging
  - c. One-way packaging is most convenient for international trade
  - d. Reusable packaging is more expensive than one-way packaging
  - e. Reusable packaging provides more product protection.
- 11. Just-in-time inventory systems are particularly applicable in which of the following situations?**
- a. Broad product range, retail environment with high volumes

- b. Narrow product range, retail environment with high volumes
- c. Broad product range, manufacturer, medium to long lead times
- d. Narrow product range, manufacturer, high volumes, short lead times
- e. Narrow product range, manufacturer, low volumes, short lead times

**12. Which of the following is NOT valid element of forecasting?**

- a. Forecasts should be timely
- b. Forecasting techniques should be relevant
- c. Forecasting should be deterministic
- d. Forecasts should be in meaningful units
- e. Forecasting should be cost-effective

**13. When evaluating the total cost of a fragile product it is important to evaluate:**

- a. The relationship between product fragility and manufacturing costs
- b. The relationship between product fragility and packaging costs
- c. The relationship between the size, weight and shape of the product/package systems and the transportation, material handling and warehousing costs.
- d. All of the above
- e. None of the above

**14. The major components of order cycle are:**

- a. Order placement
- b. Order processing
- c. Order preparation
- d. Order shipment
- e. All of the above

**15. Which statement is NOT true?**

- a. It is difficult to forecast accurately; indeed, it is impossible.
- b. The purpose of forecasting is to generate good forecasts on average over time.
- c. Forecasts for groups of items are often less accurate than forecasting demand for single items.
- d. Forecasts for a shorter time period are usually more accurate than forecasting for a longer time horizon.
- e. What happened in the past can be used as an important guideline when making forecasts.

**16. To protect against a stock-out, in 98 per cent of the times that orders are received:**

- a. One standard deviation should be kept as safety stock
- b. Two standard deviations should be kept as safety stock
- c. Three standard deviations should be kept as safety stock
- d. Four standard deviations should be kept as safety stock
- e. Orders should be placed more frequently

**17. What are the different stages of order fulfilment?**

- a. Transactional
- b. Interactive
- c. Interdependent
- d. All of the above
- e. None of the above

**18. Which of the following is not a reason to correctly record the write-off of stock?**

- a. Damages
- b. Product count shows lower amounts from the system
- c. Sale at lower than cost
- d. Sent for delivery but rejected as unwanted
- e. Obsolescence

**19. Active packaging is a growing concept for several industries and means that**

- a. A package can change colour when being handled
- b. With chemical compounds minimize oxidation of food products
- c. Protect e.g. medicine from being contaminated
- d. All of the above
- e. None of the above

**20. The three main factors that determine safety stock levels are:**

- a. Reorder point, order quantity and the required service level
- b. Lead time, order quantity and the required service level
- c. Variability in demand, variability in lead time and the required service level
- d. Variability in demand, reorder point and variability in lead time
- e. Demand, lead time and the required level of service

**21. The standard deviation is:**

- a. A measure of variability
- b. An indication of when to order
- c. A tool to calculate the order quantity
- d. A technique to calculate cycle stock requirements
- e. An indication of how much to order

**22. Which of the following products can be regarded as seasonal products?**

- a. Cigarettes
- b. Maize
- c. Hunting rifles
- d. Bread
- e. (b) and (c)

**23. It is important to view the forecasting process in a systematic way. The following four steps provide a useful paradigm:**

- Step 1: Determine the use of the forecast. Specify the objectives clearly.
- Step 2: Determine what to forecast. Select the items or quantities that are to be forecasted. For example, do you want to forecast the financial value of sales, or units of sales? Should the forecast be for total sales, or sales by region?
- Step 3: Determine the time horizon of the forecast. Is it 1–30 days (short term), one month to 18 months (medium term) or more than 18 months (long term)? Is the forecast needed on an annual, quarterly, monthly, weekly or daily basis?
- Step 4: Gather the data needed to make the forecast.
- Identify the fifth step from the list below

- a. Validate the forecasting models. This is done by evaluating how each model works in a retrospective sense, that is, how well the results fit the historical data that were used to develop the models.
- b. Make the forecasts.
- c. Do the model selection. This depends on the pattern exhibited by the data, the quantity of historical data available and the length of the forecast horizon
- d. Implement the results
- e. Track the results. Compare the forecasts with the actual values observed during the forecast horizon

**24. Examples of qualitative forecasting techniques are:**

- a. The Delphi method
- b. Jury of executive opinion
- c. Sales force composite
- d. Personal interviews with customers
- e. Consumer market survey

**25. Which component cannot be predicted in time-series data?**

- a. Trend
- b. Seasonality
- c. Random variation
- d. Cycle
- e. None of the above

**26. Which of the following statements are true? As the number of periods in the forecast,  $k$ , increases:**

- a. the moving average prediction will be smoother
- b. it is more difficult to get a good forecast
- c. the forecast will respond more quickly to changes in the data
- d. the moving average will increase over time
- e. the moving average will stay the same

**27. Which of the following is an example of dependent demand?**

- a. Bread
- b. Canned peaches
- c. Motor cars
- d. None of the above
- e. All of the above

**28. Which level of packaging is most important to consider when developing a new product?**

- a. Primary packaging
- b. Secondary packaging
- c. Tertiary packaging
- d. All of the alternatives above together
- e. Two of the alternatives above

**29. Sensor solutions used on packages can be of a TTI-type. TTI stands for...**

- a. Trust, Track, Information
- b. Time, Track, Information
- c. Timely Tracing Indicator
- d. Time and Temperature Indicator
- e. Track and Trace Information

**30. Performance measure at an interactive level includes:**

- a. Limited performance measures
- b. Some shared performance measures like lead time, on time delivery, and inventory availability
- c. Extensive use of performance measures tied to shared risk and rewards
- d. All of the above
- e. None of the above.



**SECTION B****[10 marks]****Match column A with column B**

<b>Column A</b>		<b>Column B</b>	
1	Receiving bay	A	When the product is taken out of the package, the package stops being a support of the product and becomes a product on its own and needs to be treated as such
2	Order processing	B	For any liquids, hazardous material or similar, packaging plays an essential role in containing the content
3	Cost of Disposal	C	This is inventory of the materials required to manufacture either components or the final product
4	Containment	D	This method is appropriate when little or no quantitative information is available
5	Transit inventory	E	Can vary significantly from taking days or weeks to being instantaneous
6	Raw material	F	The order is received from the client. The stock is checked for availability of all items
7	Qualitative forecast	G	This takes advantage of the wisdom and insight of a panel of people who have considerable expertise about a particular product or demand
8	Delphi method	H	The activities that take place in the period between the time a firm receives an order and the time a warehouse is notified to ship the goods to fill that order
9	Order management	I	This is inventory that is en route (either moving or awaiting movement) from one location to another
10	Order placement	J	The transport is assigned a door to unload

**SECTION C****[60 MARKS]****QUESTION 1****[30 marks]**

The following data represent total sales of the South African motor trade from January 1998 to December 1999. This value includes sales from accessories; income from fuel sales; new vehicle sales; used-vehicle sales; and work shop income **(Please answer question 1.1 to 1.4 of this question on Appendix A)**

1998			
Month	Sales (R million)	Month	Sales (R million)
1	7 449	7	8 476
2	7 954	8	7 702
3	7 941	9	7 376
4	7 714	10	7 869
5	7 660	11	7 879
6	7 692	12	7 719

1999			
Month	Sales (R million)	Month	Sales (R million)
1	7 342	7	8 376
2	7 820	8	8 535
3	7 930	9	8 590
4	7 487	10	8 700
5	7 789	11	8 665
6	7 531	12	8 424

2000			
January	February	March	April
8 184	9 454	9 378	8 752

- 1.1. Use the dataset from January 1998 to December 1999 and forecast the South African motor trade for the next four months (January – April 2000) by computing a four month moving average. [8 Marks]
- 1.2. Calculate the MSE value of the forecast accuracy, by comparing your forecasts with the actual values given for January 2000 to April 2000. [5 marks]
- 1.3. Create an exponential smoothing model that minimises the MSE for the dataset. Consider alpha to be **0,524933** (January 1998 to December 1999 [12 marks]
- 1.4. Calculate the MSE value of the forecast accuracy using the exponential smoothing model in the previous question by comparing your forecast with the actual value for January 2000 to April 2000. [5 marks]

**QUESTION 2****[15 marks]**

2.1. Given the below, Calculate the simple economic order quantity rounded to the nearest 10 units. [5 Marks]

Value of the item	R 150
Annual demand	5 000 units
Inventory carrying costs	21% per annum
Transport costs	R 20 000
Safety stock	180 units
Cost per order	R 800

2.2. Referring to the above, calculate the total annual inventory costs consisting of inventory carrying costs (including safety stock) and ordering costs. [10 Marks]

**QUESTION 3****[7 Marks]**

There are several different packaging cost. List them.

**QUESTION 4****[5 marks]**

List five E-commerce fulfilment strategies

**QUESTION 5****[8 marks]**

Discuss the major components of order cycle

## APPENDIX A

Month	Actuals	4 month MA	MSE	Exponential smoothing	MSE
1	7 449				
2	7 954				
3	7 941				
4	7 714				
5	7 660				
6	7 692				
7	8 476				
8	7 702				
9	7 376				
10	7 869				
11	7 879				
12	7 719				
13	7 342				
14	7 820				
15	7 930				
16	7 487				
17	7 789				
18	7 531				
19	8 376				
20	8 535				
21	8 590				
22	8 700				
23	8 665				
24	8 424				
25	<b>8 184</b>				
26	<b>9 454</b>				
27	<b>9 378</b>				
28	<b>8 752</b>				
		<b>MSE</b>		<b>MSE</b>	