

# BA3352 : Midterm on 8 October 2001

*This is a closed textbook and lecture notes exam. You may **not** use a calculator so leave quantities as fractions, additions or products. **Do not forget** to define any variables you introduce. Good luck.*

I declare that my conduct during the exam is entirely within the limits of the UTD regulations governing the scholastic honesty -as detailed in the handbook of operating procedures title V chapter 49.

NAME (please print): \_\_\_\_\_

Question	a	b	c	d	e	Points
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Q1 out of 75	X	X	X	X	X	
Q2 out of 10	X	X	X	X	X	
Q3 out of 15	X	X	X	X	X	
Total out of 100						

**Q1: Choose the most appropriate answer and mark your answer on the first page.**

1. Operations management encompasses
  - (a) Forecasting
  - (b) Motivating employees
  - (c) Scheduling
  - (d) Product design
  - (e) X All of the above
2. Product design and process selection are examples of:
  - (a) Financial decisions
  - (b) Short term operational decisions
  - (c) X Long term operational decisions
  - (d) Strategical decisions
  - (e) Forecasting decisions
3. Production systems with customized outputs typically:
  - (a) Have relatively high volumes of output
  - (b) Have relatively low unit costs
  - (c) Have relatively high mechanization
  - (d) Have relatively fast work movement
  - (e) X Use relatively highly skilled workers
4. Which of the following is not an ongoing trend in manufacturing competition?
  - (a) Globalization
  - (b) Quality improvement
  - (c) Flexibility and agility
  - (d) X Mass production
  - (e) Technological advances
5. The manager of a carpet store is trying to determine the best installation crew size. He has tried various crew sizes with the results shown below. Based on productivity, what crew size do you recommend:

Crew size	3	2	1
Yards installed	1017	702	320

- (a) 1
- (b) X 2
- (c) 3
- (d) 1 and 2

- (e) 1 and 3
6. Time-based approaches of business organizations focus on reducing the time to accomplish certain necessary activities. Time reductions can apply to:
- (a) Product/service design time
  - (b) Processing time
  - (c) Delivery time
  - (d) Response time complaints
  - (e) X All of the above
7. Productivity is expressed as :
- (a) Output plus input
  - (b) Output minus input
  - (c) Output times input
  - (d) X Output divided by input
  - (e) Input divided by output
8. Distinctive competencies in manufacturing organizations generally relate to:
- (a) Profit
  - (b) X Flexibility
  - (c) Infrequent machine breakdowns
  - (d) Skilled labor force
  - (e) Both c and d
9. Which of these factors affect productivity
- (a) Methods and technology
  - (b) Workers
  - (c) Management
  - (d) a and b only
  - (e) X All of the above
10. In order to increase the responsiveness of a forecast made using the moving average technique, the number of data in the average should be:
- (a) X Decreased
  - (b) Increased
  - (c) Multiplied by a larger alpha
  - (d) Multiplied by a smaller alpha
  - (e) None of the above.
11. For the data given below, what would the naive forecast be for the next month?

Month	1	2	3
Demand	60	59	61

- (a) 60
- (b) 59
- (c) 59.5
- (d) X 61
- (e) None of the above

12. In business, forecasts are the basis for:

- (a) Capacity planning
- (b) Budgeting
- (c) Sales planning
- (d) Production planning
- (e) X All of the above

13. Averaging techniques are useful for

- (a) Distinguishing between random and non-random variations
- (b) X Smoothing out fluctuations in time series
- (c) a and b
- (d) Providing accuracy in forecasts
- (e) None of the above

14. Which of the following is a measure of effectiveness of product/service design?

- (a) Development time and cost
- (b) Product/service cost
- (c) Product/service quality
- (d) X All are measures
- (e) None is a measure

15. The process of dismantling and inspecting a competitor's new or revised product for the purpose of obtaining design ideas is called:

- (a) Design by imitation
- (b) Product analysis
- (c) X Reverse engineering
- (d) Benchmarking
- (e) None of the above

16. Which of the following is a reason of recycling?

- (a) Cost savings

- (b) Environmental regulations
- (c) Environmental concerns
- (d) EPA
- (e)  All of the above

17. Which of the following possible values of alpha would cause exponential smoothing to respond most quickly to forecast errors

- (a) 0
- (b) 0.1
- (c) -1
- (d)  1
- (e) 0.5

18. The stage in a product or service life cycle where some firms adapt a defensive research posture is:

- (a) Incubation
- (b) Growth
- (c) Maturity
- (d) Saturation
- (e)  Decline

19. Which of the following smoothing constants would make an exponential smoothing forecast equivalent to a naive forecast?

- (a) 0.5
- (b) 0.1
- (c) -1
- (d)  1
- (e) 0

20. Which one of the followings is the tactic for mass customization?

- (a) Recycling
- (b) Reengineering
- (c)  Postponement
- (d) QFD
- (e) Reverse logistics

21. The two most important factors in choosing a forecasting technique are:

- (a) Cost and time horizon
- (b) Accuracy and time horizon
- (c)  Cost and accuracy

- (d) All of the above
- (e) Forecasting frequency

22. Gradual, long term movement in time series data is called

- (a) Seasonal variation
- (b) Cycles
- (c) Irregular variation
- (d) X Trend
- (e) Random variation

23. The mean absolute deviation (MAD) is used to:

- (a) Estimate the trend line
- (b) Eliminate forecast errors
- (c) X Measure forecast accuracy
- (d) Seasonally adjust the forecast
- (e) All of the above

24. One way to increase reliability is to:

- (a) Eliminate backup component
- (b) X Improve preventive maintenance procedures
- (c) Increase mean repair time
- (d) Increase the number of independent components
- (e) None of the above

25. The term "House of quality" is associated with:

- (a) Service blueprinting
- (b) X Quality function deployment
- (c) Concurrent engineering
- (d) Robust design
- (e) The Taguchi approach

26. The type of operations typically performed by a job shop is :

- (a) Project implementation
- (b) X Unit or batch production
- (c) Continuous processing
- (d) Mass production
- (e) All of the above

27. Which one of the following is not a characteristic of layout decisions?

- (a) Requires substantial investment of both money and effort

- (b) Involves long-term commitment
- (c) Impacts short-term efficiency significantly
- (d) X Usually easy to accommodate
- (e) A long-term operating decision

28. Layout in which machines are grouped so that they process items that have similar processing requirements is called:

- (a) Process layout
- (b) Product layout
- (c) Fixed-position layout
- (d) X Cellular manufacturing layout
- (e) Combination layout

29. Daily capacity of a product layout is determined by :

- (a) Cycle time divided by operating time
- (b) X Operating time divided by cycle time
- (c) Operating time divided by total task time
- (d) Total task time divided by cycle time
- (e) Cycle time divided by total task time

30. Adjusting the output rate according to the demand is an example of:

- (a) Mission
- (b) X Operational decision
- (c) Organizational strategy
- (d) Functional strategy
- (e) None of the above

Q2. SOM has been using a certain technique to forecast the number of students in a BA3352 class for the last three terms. Actual and predicted amounts are shown below.

a) Fill in the blanks in the table below:

Period	Actual	Forecast	$ error $	$error^2$	Naive	$ error $	$error^2$
1	42	37	5	25	-	-	-
2	40	44	4	16	42	2	4
3	40	42	2	4	40	0	0
Total	xx	xx	11	45	xx	2	4

b) Does naive forecasting produce better results?

MAD=11/3 and 2/2 for existing predictions and naive forecats. MSE=45/3 and 4/2 for existing predictions and naive forecats. Naive forecasting is better, it gives smaller MSA and MAD.

Q3. A company has introduced a process improvement that reduces processing time for each unit, so that output is increased by 20 % with less material, but one additional worker required. Under the old process, five workers could produce 60 units per hour. Labor costs are \$ 12/hour, and material input was previously \$ 16/unit. For the new process, material is now \$ 10/unit. Finished units sell for \$ 30 each.

a) Compute the capital productivity before the process improvement.

$$\text{Hourly Output} = 60(30)$$

$$\text{Hourly Input} = 5(12) + 60(16)$$

$$\text{Productivity} = 30/17$$

b) Compute the capital productivity after the process improvement.

$$\text{Hourly Output} = 72(30)$$

$$\text{Hourly Input} = 6(12) + 72(10)$$

$$\text{Productivity} = 30/11$$

c) How many percentages does the productivity increase with the process improvement?

$$\text{Productivity increase} = (30/11 - 30/17) / (30/17)$$