



University of Kelaniya – Sri Lanka

External Examinations Branch

Faculty of Commerce and Management

Bachelor of Business Management (General) Degree Third Examination – (External) 2009
October 2010

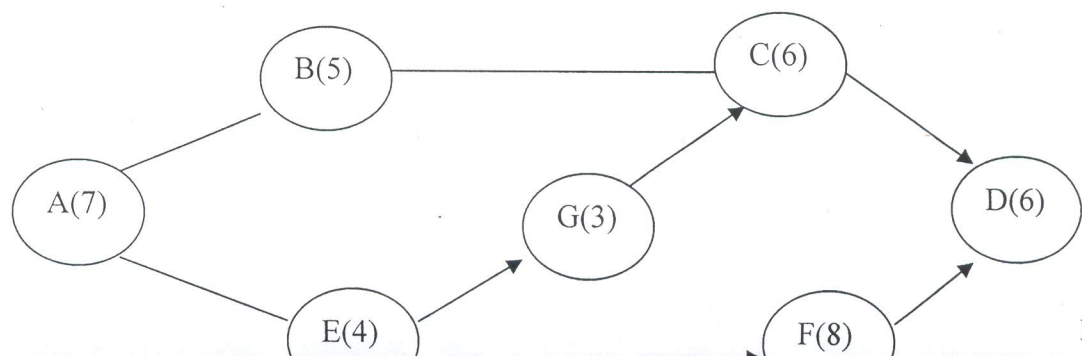
BMGT E 3045 – Operations Management

No. of Questions: 07

Time: 03 hours

Answer any five (05) questions

- (01) (a) Someone says basically Operations Management is about getting the day to day work done quickly, efficiently, without errors, and at low cost. What is your view?
(06 marks)
- (b) What is a transformation process?
(03 marks)
- (c) Explain the difference between core services and value - added services.
(04 marks)
- (d) Analyze the challenges faced by Operations Management.
(07 marks)
(Total 20 marks)
- (02) (a) Explain work measurements and standards?
(05 marks)
- (b) Explain the trends which can be impact on job design decisions?
(05 marks)
- (c) A time study was made for an existing job to develop new time standards. A worker was observed for 45 minutes. During that period, 30 units were produced. The analyst rated the worker as performing at 90 percent performance rate. Allowed time for rest and personal matters is 12 percent.
- (i) What is the normal time for the task?
- (ii) What is the standard time for the task?
- (iii) If the worker produced 300 units in an eight hour day, what would be the day's pay if the basic rate was Rs. 6 per hour and the premium payment system paid on a 100 percent basis?
(10 marks)
(Total 20 marks)
- (03) (a) Here is a CPM network with activity times in weeks.



- (i) Determine the critical path
- (ii) How many weeks will the project take to complete?
- (iii) Suppose F could be shortened by two weeks and B by one week. How would this affect the completion date?

(10 marks)

- (b) C-town brewery brews two beers. **"Red Star"** and **"Super Taste"**. Red star sells for Rs. 20 per barrel while **Super Taste** sells for Rs. 8 per barrel. Producing a barrel of **Red Star** takes 8 pounds of corn and 4 pounds of hops. Producing a barrel of **Super Taste** takes 2 pounds of corn, 6 pounds of rice and 3 pounds of hops. The brewery has 500 pounds of corn, 300 pounds of rice and 400 pounds of hops. Assuming a linear relationship, determine the optimal mix of **Red Star** and **Super Taste** that maximizes C-town's revenue.

(10 marks)

(Total 20 marks)

- (04) (a) What is Strategic Capacity Planning?

(02 marks)

- (b) What do you mean by Capacity Utilization Rate?

(02 marks)

- (c) ABC Corporation would like to determine capacity requirements for the next four years. Currently two production lines are in place as bronze items and plastic items. Three types are available for both bronze items and plastic items as small, medium and large. Management has predicted demand for the next four years as follows.

Yearly demand ('000)

	Year 1	Year 2	Year 3	Year 4
Plastic - small	32	44	55	56
Plastic - Medium	15	16	17	18
Plastic - Large	50	55	64	67
Bronze - Small	7	8	9	10
Bronze - Medium	3	4	5	6
Bronze - Large	11	12	15	18

Both production lines can produce all the different types of items. Each bronze machine requires two operators and can produce up to 12,000 items. The plastic machine requires four operators and can produce up to 200,000 items. Three bronze machines and only one plastic machine are available.

What are the capacity requirements for the next four years?

(16 marks)

(Total 20 marks)

- (05) (a) Differentiate between process layout and product layout?

(05 marks)

- (b) An assembly line is to be designed to operate 7 1/2 hours per day and supply a steady demand of 300 units per day. Here are the tasks and their performance times.

Task	Preceding tasks	Performance Time (Seconds)
a	-	70
b	-	40
c	-	45
d	a	10
e	b	30
f	c	20
g	d	60
h	e	50
i	f	15
j	g	25
k	h,i	20
l	j,k	25

- (i) Draw the precedence diagram.
- (ii) What is the workstation cycle time?
- (iii) What is the theoretical minimum number of workstations?
- (iv) Assign tasks to workstations and find idle time of each station.
- (v) What is the efficiency of your line balance.

(16 marks)

(Total 20 marks)

- (06) (a) Explain the purposes of an inventory control system.

(04 marks)

- (b) ABC Company Ltd. operates a stock control system which is based on re-order levels and economic order quantities. The system does not allow for any uncertainties. This has caused some concerns among the senior management as demand, lead time, etc., which cannot be predicted with complete accuracy.

In order to evaluate the system, the company selected some stock items and studied them in detail. Resulting from this exercise the following data relating to item 'A 110' was revealed.

Cost of carrying	=	Rs. 2 per annum
Current Re-order level	=	175,000 units
Re-order cost	=	Rs. 1,000 per order

The following probabilities are also available

Demand per working day (units)	Probability
75,000	0.5
10,000	0.5

Lead time (Days) Probability

12 working days	0.2
16 working days	0.5
20 working days	0.3

The company works 280 days in a typical year.

You are asked to provide the following information

- (i) Expected demand in lead time
- (ii) The safety stock considering a re-order level of 175,000 units
- (iii) The Economic Order Quantity
- (iv) The expected annual stock out in units.

(16 marks)
(Total 20 marks)

(07) (a) Explain the Delphi Method.

(03 marks)

(b) Demand for stereo headphones for last year was as follows.

Month	Demand (units)
January	4200
February	4300
March	4000
April	4400
May	5000
June	4700
July	5300
August	4900
September	5400
October	5700
November	6300
December	6000

- (i) Using a weighted moving average with weights 0.60, 0.30 and 0.10 find the forecasted demand for January next year.
- (ii) Using a simple three month moving average, find the forecasted demand for January next year.
- (iii) Using single exponential smoothing with $\alpha = 0.2$, find forecasted demand for January next year.
- (iv) Calculate MAD for the forecasts.
- (v) Using simple linear regression analysis, calculate the regression equation for the preceding demand data, and calculate forecasted demand for January next year.

(17 marks)
(Total 20 marks)