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EASTERN UNIVERSITY SRI LANKA

FACULTY OF COMMERCE AND MANAGEMENT

EXTERNAL DEGREES

PART- 111 (4TH) EXAMINATION IN BACHELOR OF BUSINESS ADMINISTRATION - 2007/08 APRIL / MAY 2011 (PROPER/ REPEAT)

EXB 404 OPERATIONAL MANAGEMENT

Answer all Questions Time: 3 hours

Mary Ltd. Manufactures and sells a variety of board games and toys. The board games use dice, counters, cards, paper money etc and are based on holidays, football, careers, horse racing, murder mysteries etc. The toys are classified as **soft** or **hard**. The soft toys are made from non-toxic, flame-resistant polyester fibre, e.g. teddy bears, fur animals etc. The hard toys are made from non-toxic plastic and wood. Mary Ltd's main customers are large retailers and wholesalers. It employs over 400 people.

SALES OF THE FOUR MAIN BOARD GAMES

The company has four main board games. A, B, C and D. Their quarterly sales since 2007, given in hundreds of units, as shown below.

	2007				2008				2009				2010
	Q_1	Q_2	Q_3	Q_4	Q_1	Q_2	Q_3	Q_4	Q_1	Q_2	Q_3	Q_4	Q_1
A	52	47	50	51	48	49	52	51	46	51	52	51	50
B	75	80	110	175	92	96	122	210	111	116	164	259	135
C	73	74	100	153	77	76	98	149	73	74	102	151	76
D	150	143	181	256	123	116	148	213	100	95	120	175	80

Previous research has established that the sales of B, C and D are all subject to the same seasonal pattern as follows.

Quarter	1	2	3	4
Seasonality	-25%	-25%	0	+50%

All four games are currently sold to the trade for Rs. 20.00 each. Mary Ltd's management accountant has estimated that the contribution to profit per unit of A, B, C and D is respectively Rs. 12, Rs. 8, Rs.16 and Rs. 16.

PRODUCTION OF BOARD GAMES

Two of the games, B and C are manufactured in the same way on the same equipment. There are three stages in the manufacture: boarding, printing and packaging. The manufacturing times required for each game (in minutes) and the total time the equipment is available each week (in hours) are as follows.

	Boarding	Printing	Packaging
Game B	8 minutes	12 minutes	4 minutes
Game C	8 minutes	24 minutes	8 minutes
Total time available each week	280 hours	480 hours	200 hours

The current stock and demand position is such that, for the next few weeks, at least twice as many of game B must be produced as game C. Company policy is to try to maximize contribution to profit.

STOCK COSTS OF BOARD GAME A

Special boards for A are bought from a local supplier. The management accountant estimates that the order costs (administration and delivery etc) of placing any order are Rs. 100, regardless of its size. The holding costs (storage etc) of keeping one game in stock for a year are 10% of its ex-factory price to the trade. The supplier is willing to deliver 'same', i.e. with no lead time. At present, Mary Ltd adopts a policy of ordering a constant amount of boards at regular intervals, although the supplier could provide up to 640 boards a day if necessary. Mary Ltd trade for 250 days a year. (The proportion of boards scrapped during production is negligible.)

PACKAGING OF TOYS

Many of the toys produced are high-quality and need to be packed with care. Management is concerned about the amount of time which this takes. For several weeks' quality control staff has been engaged in 'time and motion' studies, and analyzing work practices with the operatives directly involved.

a) Determine the optimum weekly contribution to profit from games B and C by formulating, and graphically solving, the linear programming production model.

(15 marks)

b) Explain your solution to (a) above for management, including recommendations for optimal product mix and profit.

(07 marks)

(Total 22 Marks)

Q2. a) *"Intermittent operations /Batch productions are highly flexible but much less efficient than line processes."*

Critically analyze this statement

(Marks 10)

b) Identify and describe the advantages of job production over other types of production.

(08 Marks)

(Total Marks 18)

Q3. a) *"In fast changing industries, new product introduction is a way of life, and high sophisticated approaches have been adopted to introduce new products. New product design is crucial to the survival of most firms."*

In view of the above statement explain what is the appropriate role of the Operations Management in designing a product.

(10Marks)

b) What is meant by the statement that "Production is an internal function"?

(04Marks)

c) If the Production function is internal, what are the effects of being internal?

(04Marks)

(Total Marks 18)

Q4. a) *"Since the pattern of flow is so different in each type of process, the layout decisions will also differ for each. But in general, Japanese are masters at the layout of factories".* Outline the factors that should be considered in selecting a site for a cement factory.

(10 Marks)

b) *"layout affects the behaviour of people and their perception of the job, ultimately affecting job performance, motivation and satisfaction".* With the above view, identify and explain the behavioural factors which may be important in making layout decisions.

(08 Marks)

c) Define the term "Replacement," briefly explain the main reason for replacing machinery and equipment in an organisation.

06 Marks)

(Total Marks 24)

5 A profit making project concern has received a special order for a special product. The product is a non-standard item that the firm has never produced before, and scheduling personnel have decided that the application of Critical Path Method (CPM) is warranted. A team of project engineers has prepared the following table.

Activity	Duration (weeks)	Normal cost (Rs)	Crash duration (weeks)	Crash cost (Rs)
1-2	5	800	3	1100
1-3	7	950	3	2150
1-4	6	600	4	1400
2-5	0	-	0	-
2-6	7	1100	5	1500
3-7	4	750	4	750
4-7	9	1600	8	1800
4-8	10	1000	9	1300
5-6	6	1300	4	2200
6-9	9	2000	8	2500
7-9	9	1500	7	2000
8-9	7	900	5	1600

a) Construct the appropriate network diagram and indicate the critical path.

(06Marks)

b) What is the expected completion time for the project?

(03Marks)

c) Use the data in the time cost information table to select appropriate time-cost alternatives for reducing the project duration by:

(1) One week

(2) Two weeks

(3) Three weeks

(09Marks)

(Total Marks 18)