UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2009/2010

SUBJECT NAME	:	PRODUCTION AND OPERATION MANAGEMENT
SUBJECT CODE	:	BPB 3113
COURSE	:	4 BPB
EXAMINATION DATE	:	APRIL / MAY 2010
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSIST OF 5 PAGES

Q1 Mirza Manufacturing produces a product for which the annual demand is 10,000 units. Production averages 100 per day, while demand is 40 per day. Holding costs are RM2.00 per unit per year; set-up costs RM200.00.

If they wish to produce this product in economic batches, calculate:

(a) Maximum inventory level.

(2 marks)

(b) Order cycles are there per year.

(2 marks)

(c) Total of annual inventory management costs.

(2 marks)

Q2 Explain **THREE (3)** steps to conduct forecasting.

(6 marks)

Q3 Given the following data:

Table Q3 shows the demand for Amar's Company for Year 1 until Year 9.

Table Q3: Demand for Amar's Company

Year	Demand
1	74
2	90
3	59
4	91
5	140
6	98
7	110
8	123
9	99

Calculate the three-year moving averages for years 4 through 10.

(4 marks)

Q4 Weekly usage of a product is 8 units. Since the plant operates 50 weeks per year, this leads to annual usage of 400 units. Setup cost is RM40 and annualized carrying cost is RM80. Weekly production of this product is 12 units. Lead time is four weeks, and safety stock is one week's production.

Calculate:

(a) The optimal kanban size.

(1 mark)

(b) The optimal number of kanbans.

(1 mark)

Q5 Consider a product that is "settled in". Its Mean Time Between Failure (MTBF) distribution has been found to be normal with a mean of 10,000 hours and a standard deviation of 100 hours.

(a) Calculate:

(i) The probability of a breakdown before 8,000 hours.

(2 marks)

(ii) The probability before 9,000 hours.

(2 marks)

(b) Explain which policy would you prefer between a policy of preventive maintenance or policy of breakdown maintenance Based on the answer in Q5(a);.

(3 marks)

Q6 A company is about to select a vendor for the outsourcing of all of its engineering, environmental, and CAD requirements. It has identified four criteria critical to the selection. Table Q6 indicates criterion and its weightage. Three firms, A, C, and E, have indicated that they are interested in this position. The company has scored each of the three candidates on these criteria, using a 1-10 scale, where 10 is best. Candidate A scored 7, 7, 7 and 5 on the four criteria. Candidate C scored 9, 4, 8 and 6. Candidate E scored 5, 10, 10 and 7.

Table Q6: Criterion and its weightage

Criterion	Weight
Engineering expertise	0.40
Financial and managerial strength	0.20
Integrity	0.15
Staff experience and qualifications	0.25

(a) Calculate all options.

(3 marks)

(b) Identify the vendor that has the highest composite score.

(1 mark)

Q7 Table Q7 indicates a network activities. Times are given in weeks.

Table Q7: A network activities

Activity	Preceding	Optimistic	Probable	Pessimistic
A	--	5	11	14
B	-	3	3	9
C	--	6	10	14
D	A, B	3	5	7
E	B	4	6	11
F	C	6	8	13
G	D, E	2	4	6
H	F	3	3	9

(a) Illustrate the network diagram.

(3 marks)

(b) Calculate the expected duration and variance of each activity.

(4 marks)

(c) Calculate the expected duration and variance of the critical path.

(4 marks)

(d) Calculate the probability that the project will be completed in less than 28 weeks.

(3 marks)

END OF QUESTION PAPER