



UTHM

Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION SEMESTER I SESSION 2018/2019

COURSE NAME : PRODUCTION AND OPERATIONS
MANAGEMENT

COURSE CODE : BPB 31103

PROGRAMME CODE : BPA / BPP

EXAMINATION DATE : DECEMBER 2018 / JANUARY 2019

DURATION : 3 HOURS

INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

- Q1** (a) Describe the relationship between ordering cost and setup cost. (3 marks)
- (b) Explain **TWO (2)** assumptions of the Economic Order Quantity (EOQ) model. (4 marks)
- (c) Innovex Computing manufactures an inexpensive audio card (Audio Max) for assembly into several models of its microcomputers. The annual demand for this part is 100,000 units. The annual inventory carrying cost is RM5 per unit and the cost of preparing an order and making production setup for the order is RM750. The company operates 250 days per year. The machine used to manufacture this part has a production rate of 2,000 units per day.

Calculate:

- (i) Optimum lot size. (4 marks)
- (ii) Expected number of orders. (4 marks)
- (iii) Average inventory. (5 marks)

- Q2** Techno Steel Corporation is considering three expansion options. The first is to do nothing (Option A). The next is to leave the current plant open and also open a new larger plant (Option B). Finally, they could close the existing plant and open the new, larger one (Option C). The fixed costs (FC) and variable costs (VC) for three potential options for expansion are in the following **Table Q2**.

Table Q2: Fixed and Variable Costs

Option	FC per year (RM)	VC per unit (RM)
A	50,000	2
B	100,000	1
C	60,000	1.4

- (a) Plot a graph to illustrate the optimal range of production for each options. (16 marks)
- (b) Determine the best option for a production if the expected volume is 2,000 units per year based on the graph in **Q2(a)**. (1 mark)

TERBUKA

- (c) Calculate the expected profit for the best option in **Q2(b)** if the expected selling price of unit produced is RM299. (3 marks)

Q3 (a) Explain the objective of scheduling. (2 marks)

(b) Differentiate between finite and infinite loading. (4 marks)

(c) You are managing a furniture restoration company and have four tasks to be completed through a two-step processes. The first process involves sanding and the second involves polishing. The time for processing each job is shown in **Table Q3**.

Table Q3: Time Processing for each task

Task	Sanding (Hours)	Polishing (Hours)
C13	2.5	1.7
C81	3.8	2.6
D5	1.9	1.0
D44	1.8	3.0

- (i) Calculate the optimal sequence for these tasks to be scheduled. (5 marks)
- (ii) Illustrate these tasks through the two-step processes. (5 marks)
- (iii) Determine the total length of time of this optimal solution. (2 marks)
- (iv) Determine idle time for both processes. (2 marks)



UNIVERSITI TEKNOLOGI MARA
Fakulti Pendidikan dan Teknologi
Jalan Pendidikan dan Teknologi
43400 Seremban, Negeri Sembilan
Malaysia

Q4 (a) Discuss **THREE (3)** basic demand options and with examples. (6 marks)

(b) Delicious Juice Sdn. Bhd. has launched a new passion fruit drink and Sarah as a production planner need to develop its aggregate schedule. **Table Q4** shows the aggregate demand requirements and other data for the upcoming six quarters.

Table Q4: Aggregate Demand Requirements and Other Data

1	Month	Demand
	1	900
	2	1,100
	3	1,400
	4	800
Other Data		
2	Previous output level	1,000 units
3	Beginning inventory	200 units
4	Stockout cost	RM50 per unit
5	Inventory holding cost	RM30 per unit at the end of month
6	Hiring workers	RM40 per unit
7	Layoff workers	RM60 per unit
8	Unit cost	RM20 per unit
9	Overtime	RM50 extra per unit
10	Subcontracting	Not available

(i) Develop an aggregate plan for the next four months using; Plan A - chase plan by hiring and layoffs (to meet demand) and Plan B – level plan that holds employment steady. (12 marks)

(ii) Determine the most economical plan from the result of **Q4(b)(i)**. (2 marks)

Q5 (a) State **TWO (2)** maintenance tactics used to maintain the system capability. (2 marks)

(b) Differentiate preventive maintenance and breakdown maintenance. (4 marks)



DR. SHARIF ALBEN SITI ROZALAN
 Pengetua
 Pusat Penyelidikan dan Teknologi
 Institut Penyelidikan Teknologi dan Inovasi
 Universiti Kebangsaan Malaysia

- (c) Everlasting Manufacturing is a battery manufacturing company has tested sixteen batteries for 150 hours. One failed at 45 hours; another failed at 75 hours; all others completed the test.

Calculate:

- (i) Percentage of failure. (2 marks)
- (ii) Number of failures per unit hour. (6 marks)
- (iii) Number of failures per unit year. (4 marks)
- (iv) Mean Time Between Failure (MTBF) for this units. (2 marks)

- END OF QUESTIONS

TERBUKA

CONFIDENTIAL