



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2021/2022**

COURSE NAME : INDUSTRIAL MANAGEMENT

COURSE CODE : BPB 22103

PROGRAMME CODE : BPB

EXAMINATION DATE : JULY 2022

DURATION : 3 HOURS

INSTRUCTION : 1. ANSWER ALL QUESTIONS.

2. THIS FINAL EXAMINATION IS AN **ONLINE ASSESSMENT AND CONDUCTED VIA CLOSED BOOK.**

3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK.

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

Q1 A firm has an annual demand for a component of 3000 units. A fixed cost of RM250 is incurred each time an order is placed and holding cost are computed at 25% of unit value per year. Supplier A will sell the component for RM 10 regardless of order sizes. In addition, supplier B will only accept order of at least 600 units at a unit price of RM9.50. Meanwhile, supplier C will charge RM9 per item but requires a minimum order of 800 units.

(a) Determine the best supplier with the appropriate number of order quantities. (8 marks)

(b) Compare the cost savings in **Q1(a)** with the other two suppliers. (8 marks)

Q2 A city sanitation department needs the following numbers of employees each week as shown in **Table Q2**. There is no waste collection on Sunday, thus no workers work on Sunday.

Table Q2: Worker daily distribution for each day

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Number of worker needed	6	6	6	6	10	10	0

Propose a schedule that covers all requirements while giving two consecutive days off for each worker using Tibrewala, Philippe and Browne method. (8 marks)

Q3 A set of five jobs is ready for dispatching to a machine center. The processing times and due dates for the jobs are given in the **Table Q3**.

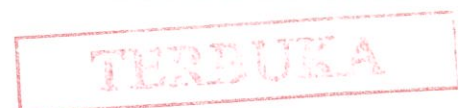
Table Q3: Processing time and due date

Job	Processing Time (days)	Due Date (Day)
A	2	7
B	8	16
C	4	4
D	10	17
E	5	15
F	12	18

(a) Determine the sequence would the job be ranked according to:

- (i) Earliest Due Date (EDD).
- (ii) First Come First Serve (FCFS).

(2 marks)



- (b) Calculate for each sequence in **Q3(a)**:
 - (i) Average completion time.
 - (ii) Average number of jobs in system.
 - (iii) Average job lateness.
 - (iv) Utilization.

(8 marks)
- (c) Explain the best option for the job using a table.

(4 marks)
- (d) Describe the type of manufacturing system process for this scheduling.

(2 mark)

Q4 These four jobs (A, B, C, D) to be processed through three work centers (M1, M2, M3). The processing time at each of the work centers is shown in the following **Table Q4**.

Table Q4: Processing time (in hours)

Work centers	Job			
	A	B	C	D
M1	4.3	3.5	3.3	4.0
M2	2.9	4.0	4.5	3.2
M3	1.9	2.7	3.0	4.5

- (a) Prepare the optimal sequence for these jobs to be scheduled.

(4 marks)
- (b) Propose the best schedule that will minimize the makespan of the four jobs.

(15 marks)
- (c) Determine the total length of time of this optimal solutions.

(1 mark)
- (d) Calculate the total idle time.

(2 marks)
- (e) Describe the type of manufacturing system process for this scheduling.

(2 marks)



Q5 Fairview Industry is preparing its aggregate plan for the second half of the year. Monthly demand estimation and working days per month shows in **Table Q5**.

Table Q5: Monthly demand estimation & working days/month

Month	Expected Demand (unit)	Production Days
July	18,000	20
August	21,000	23
September	17,500	21
October	12,500	21
November	12,000	20
December	13,500	21

- (a) Determine the total demand. (1 mark)
- (b) Compute demand per day (for each month). (4 marks)
- (c) Compute average requirement (in units per day) over the six-month planning horizon. (4 marks)
- (d) Prepare a graph of forecast demand and level production, by months, for the planning period. (6 marks)

Q6 Great Southern Consultants Group's computer system has been down several times over the past few months. They are considering signing a contract for preventive maintenance. With preventive maintenance, the system would be down on average only 0.5 per month. The monthly cost of preventive maintenance would be RM200 a month. **Table Q6** shows numbers of breakdown and its frequency of occurrences.

Table Q6: Number of Breakdowns

Number of breakdowns	0	1	2	3	4
Monthly frequency	9	2	4	4	1

- (a) Calculate the expected numbers of breakdowns per month. (5 marks)
- (b) Analyse the expected breakdown cost based on the data in **Table Q6**. The cost per breakdown is RM400. (5 marks)

- (c) Calculate the preventive maintenance cost per month. (5 marks)
- (d) Propose to the organizations, the best solution to overcome the breakdown. (6 marks)

-END OF QUESTIONS-

