



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION  
SEMESTER II  
SESSION 2023/2024

- COURSE NAME : PRODUCTION PLANNING AND CONTROL
- COURSE CODE : BPC 22103
- PROGRAMME CODE : BPB / BPP
- EXAMINATION DATE : JULY 2024
- DURATION : 3 HOURS
- INSTRUCTIONS :
1. ANSWER ALL QUESTIONS
  2. THIS FINAL EXAMINATION IS CONDUCTED VIA
    - Open book
    - 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** In order to assemble Q, it needs one unit of C, one unit of E. C is made of one unit of D and two units E. All the lead times are 1 week, except for C, which have a lead time of 2 weeks.

- (a) Illustrate the Bill of Materials (BOM) for Q with level coding. (8 marks)
- (b) There is an order for 200 units of product Q in period 7 and no open orders on any item. The lot size and on-hand inventory levels for each item are shown in **Table Q1.1** and the product structure for Q in **Figure Q1.1**.

**Table Q1.1** Lot size and Quantity on Hand

Item	Lot Size	Quantity on Hand
Q	Lot for Lot	6
C	1	20
D	200	0
E	500	30

Analyse the Material Requirement Planning (MRP) for product Q. (18 marks)

- (c) Prepare the planned order report for product Q. (4 marks)

**Q2** (a) A department works on 8 hours shift, 250 days a year and has the usage data of a machine, in **Table Q2.1**.

**Table Q2.1** Data for setup time and run time for each operation.

Product	Annual demand (units)	Processing time (standard time in hours)
X	300	4.0
Y	400	6.0
Z	500	3.0

- (i) Calculate the annual production capacity of one machine. (5 marks)
- (ii) Calculate number of machines required. (7 marks)

- (b) A company that manufactures paving material for driveways and parking lots expects the following demand for its product in the next four weeks as shown in **Table Q2.2B**.

**Table Q2.2 Demand**

<b>Week Number</b>	1	2	3	4
<b>Material (tons)</b>	40	80	60	70

Meanwhile, **Table Q2.3** shows the available capacity for company's labour and machine standards.

**Table Q2.3 Available Capacity**

	<b>Labor</b>	<b>Machine</b>
Production standard (hours per ton)	4	3
Weekly production (hours)	300	200

- (i) Analyse the capacity utilization for labour and machine by comparing each of the four weeks.

(8 marks)

- (ii) Propose **ONE (1)** solution to resolve the problems.

(7 marks)

- Q3** (a) Today's date is 205. Orders A, B, C and D have the following due dates and lead time remaining as shown in **Table Q3.1**.

**Table Q3.1 Due date and Lead Time**

<b>Job</b>	<b>Due Date</b>	<b>Remaining Processing Time</b>
A	212	6
B	209	3
C	208	3
D	210	8

- (i) Determine actual time remaining:

(2 marks)

- (ii) Calculate Critical ratio for the jobs.

(2 marks)

- (iii) List the job sequence based on the critical ratio answer in **Q3(a)(ii)**.  
(2 marks)
- (iv) State **TWO (2)** dispatching rules.  
(1 mark)
- (v) Analyse the scheduling efficiency of the dispatching rules presented in terms of lateness based on your answer in **Q3(a)(iv)**.  
(9 marks)

(b) **Table Q3.2** shows lead time data from the work centre file and **Table Q3.3** shows routing file data. Since this is a rush order, it is given top priority and is run as soon as it arrives at either workstation.

**Table Q3.2** Lead time data from work centre file.

Work Centre	Wait Time (hours)	Move Time (hours)
123	1	10
234	2	20
456	3	0
678	1	100

**Table Q3.3** Routing file

Operation	Work Centre	Setup Time (hours)	Run Time (hours/unit)
AA	123	0.20	2.00
BB	234	0.10	2.50
CC	456	0.10	1.00
DD	678	0.15	2.00

Calculate the Total Manufacturing Lead Time for 1500 of product Z.  
(9 marks)

- (c) Justify selected method to reduce manufacturing lead time in **Q3(b)**.  
(2 marks)
- (d) Operation overlapping is one of the approaches to reduce manufacturing lead time when processing time is significant.  
State **TWO (2)** other approaches to help reduce manufacturing lead time.  
(2 marks)



- Q4** (a) List **FOUR (4)** functions of purchasing management in a manufacturing firm.  
(4 marks)
- (b) Explain **TWO (2)** impacts of Material Requirement Planning (MRP) on purchasing based on communication perspective.  
(4 marks)
- (c) Outline **THREE (3)** methods that can be implemented in the purchasing department to minimise the impact of the business organisation on the environment.  
(6 marks)

**- END OF QUESTIONS -**