UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2018/2019

COURSE NAME	:	PRODUCTION PLANNING AND CONTROL
COURSE CODE	:	BPC 22103
PROGRAMME CODE	:	BPB / BPP
EXAMINATION DATE	:	JUNE / JULY 2019
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **SIX (6)** PAGES

Q1   Copy Cantik (CC) is a fledging copy center in downtown Parit Raja run by two college students. Currently, the equipment consists of two high-speed copiers that can be operated by one operator. If the students work alone, it is conceivable that two shifts per day can be staffed. The students each work 8-hours a day, 5 days a week. They do not take breaks during the day, but they do allow themselves 30 minutes for lunch or dinner. In addition they service the machines for about 30 minutes at the beginning of each shift. The time required to set up for each order varies by the type of paper, use of color, number of copies, and so on. Estimates of setup time are kept with each order. Since the machines are new, their efficiency is estimated at 90 percent.

Due to extensive advertising and new customer incentives, orders have been pouring in. The students need help determining the capacity or their operation and the current load on their facility. The information of operation is shown in **Table Q1**:

Table Q1: Operation Information

Job No	No. of Copies	Setup Time (min)	Run Time (min/unit)
10	500	5.2	0.08
20	1000	10.6	0.10
30	5000	3.4	0.12
40	4500	11.2	0.14
50	2000	15.3	0.10

(a)   Calculate:

(i)   The normal daily capacity of Copy Cantik.

(3 marks)

(ii)   Total load for next Monday.

(7 marks)

(iii)   Load percent.

(2 marks)

(b)   Intepret the result based on **Q1(a)(iii)**.

(4 marks)

(c)   Compare the result in **Q1(a)(iii)** if each worker extend working time by approximately 36 minutes.

(5 marks)

(d)   Analyse the result in **Q1(a)(iii)** if the efficiency increase to 97 percent.

(5 marks)

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Q2 The ABC Company makes Z product for commercial customers. The Z product is made up of X painted surface on both sides and a wooden Y frame. The Z product is put together in final assembly, the X surfaces are painted in the paint shop, and Y frame is made in the frame shop. Given, **Figure Q2** shows the product structure, **Table Q2(a)**, **Table Q2(b)** and **Table Q2(c)** shows the MRP records and **Table Q2(d)** shows capacity requirements for product Z.
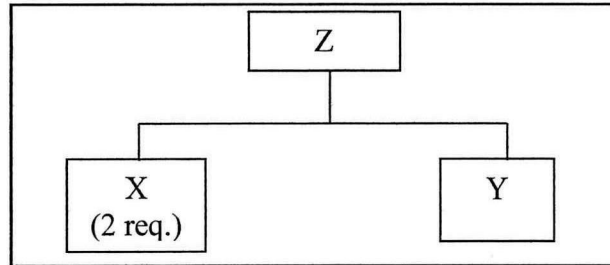
Figure Q2: Product Structure

Table Q2(a): MRP Records

Item: Z		Week					
		1	2	3	4	5	6
Gross Requirements		20	20	20	20	20	20
Sheduled receipts							
Projected available balance	25	5	0	0	0	0	0
Planned order release		15	20	20	20	20	
Q = L4L, LT = 1, SS = 0							

Table Q2(b): MRP Records

Item: X		Week					
		1	2	3	4	5	6
Gross Requirements		30	40	40	40	40	0
Sheduled receipts		50					
Projected available balance	25	45	5	15	25	35	35
Planned order release		0	50	50	50	0	0
Q = 50, LT = 1, SS = 5							

Table Q2(c): MRP Records

Item: Y		Week					
		1	2	3	4	5	6
Gross Requirements		15	20	20	20	20	0
Sheduled receipts		15					
Projected available balance	10	10	20	0	10	20	20
Planned order release		30	0	30	30	0	0
Q = L4L, LT = 1, SS = 0							

Table Q2 (d): Capacity Requirements

Operation	Work Center	Setup Time	Run Time
Z Assembly	Final Assembly	2 hours	1.0 hours
Paint X surfaces	Paint Shop	4 hours	0.4 hours
Fabricated Y frame	Frame Shop	3 hours	0.5 hours

Based on the information given in **Figure Q2, Table Q1(a), Table Q2(b) Table Q2(c)** and **Table Q2(d)**:

Calculate total load needs for next five weeks,

(a)   Final assembly.

(11 marks)

(b)   The paint shop.

(10 marks)

(c)   The frame shop.

(9 marks)

Q3   Tekan-Tekan Sdn. Bhd. has order for 200 Model AS-120 calculator for delivery on day 200. The calculator consists of three parts. Components 2 and 3 form subassembly 1. Sub-assembly 1 and component 4 form the final assembly. Following are the work centers and times of each operation. **Table Q3(a)** shows routine file of the operation.

Assuming:
- Only one machine is assigned to each operation
- The factory works on 8-hour shift, 5 days a week
- All parts move in one lot of 200

Table Q3(a): Routine File

Part	Operation	Standard Time (days)
4	10	5
	20	7
2	10	5
	20	7
3	10	12
	20	5
Sub-assembly 1		7
Final Assembly AS-120		5

(a)   Illustrate the backward schedule based on the information given above.

(12 marks)

(b)   Identify when component 3 must be started to meet the delivery date.

(2 marks)

Q4   Jobs A, B, and C are queued at Work Center 10 before being completed on Work Center 20. **Table Q4** shows information pertains to the jobs and the work centers. For this problem, there is no move time and today is Day 1.

Table Q4: Jobs Information

Job	Process Time (days)		Due Date
	Work Center 10	Work Center 20	
A	7	3	12
B	5	2	24
C	9	4	18

Analyse whether they can complete the job on time if start day and stop day report for Works Center 10 and Work Center 20 for each job are scheduled by the earliest due date (EDD).

(15 marks)

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Q5   Tuah recently purchased a chain of dry cleaners in Bangi. Although the business is making a modest profit now, Tuah suspects that if he invests in a new press, he could recognize a substantial increase in profits. The new press costs RM15, 400 to purchase and install and can press 40 shirts an hour (or 320 shirts per day). Tuah estimates that with the new press, it will costs RM0.25 to launder and press each shirt. Customers are charged RM1.10 per shirt.

(a)   Calculate:

   (i)   Total number of shirts will Tuah have to press to break even.

   (5 marks)

   (ii)   Total days would take to break even on new press at the low-demand estimates and at the high demand estimates, if Tuah's workload has varied from 50 to 200 shirts a day.

   (4 marks)

   (iii)   Total days would take to break even when Tuah cuts his price to RM0.99 a shirt, he expects to be able to stabilize his customer base at 250 shirts per day.

   (4 marks)

(b)   Discuss whether Tuah should cut his price and buy new press based on result in **Q5(a)(ii)** and **Q5(a)(iii)**.

   (2 marks)

- END OF QUESTIONS -