UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2017/2018

COURSE NAME	:	INDUSTRIAL MANAGEMENT
COURSE CODE	:	BPC 23303/BPB 22103
PROGRAMME CODE	:	3BPB/ 2BPB
EXAMINATION DATE	:	JUNE/JULY 2018
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

Q1 Sara & Zara Sdn Bhd needs an aggregate plan for July to December. The company has gathered the data as shown in **Table Q1** for batik demand.

Table Q1 : Batik demand

Month	July	August	September	October	November	December
Demand	400	500	550	700	800	700

Additional information;

Holding Cost	RM 8 piece per month
Subcontracting	RM 80 per piece
Regular time labour	RM 10 per hour
Overtime labour	RM 16 per hour per worker per day
Hiring cost	RM 40 per worker
Layoff Cost	RM 80 per worker
Current workforce	15 people
Labour hours per piece	4 hours
Workdays per month	20 day
Beginning Inventory	Nil

Calculate the production cost for the planning horizon using a constant workforce strategy by varying overtime and inventory.

(25 marks)

Q2 (a) A company has received four orders from the International University to provide ICT accessories to them. The processing time and due date shown in the **Table Q2(a)**.

Table Q2(a) : Processing time and due date

Job	**Processing Time**	**Due Date (Day)**
A	205	6
B	203	3
C	208	4
D	210	8

Assuming today is day 200 on the company's schedule.

(i) Determined the sequence would the job be ranked according to Shortest Process Time (SPT), Earliest Due Date (EDD) and Longest Process Time (LPT).

(6 marks)

(i) Determined which is the best option for the job based on answers in **Q2** (a)(i).

(4 marks)

(b) The following set of five jobs is to be processed through two work centers at Printing Company. The sequences are printing, binding and packaging. Processing time at each of the work centers is shown in the following **Table Q2(b)**.

Table Q2(b) : Processing time at each work centers

Jobs	Printing	Binding	Packaging
A	17	3	2
B	9	5	4
C	23	8	5
D	15	2	1
E	21	6	3

(i) Analyse these jobs through the three work stations using Johnson's rule.

(18 marks)

(ii) Determine the total length of time of this optimal solutions based on **Q2(b)**.

(2 marks)

Q3 Saloon Centre operated seven days a week but facing fluctuating demand. The saloon's owner is interested to make sure distribution of worker per day is optimised. Her analysis of staffing distribution showed in the **Table Q3**.

Table Q3 : Worker daily distribution for each day

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Number of worker needed	6	5	5	5	6	4	3

Construct a schedule that covers all requirements while giving two consecutive days off for each worker.

(20 marks)

Q4 A firm had bought 15 photostat machines with the price of RM20 000 per unit excluded the maintenance cost. Recently, these machines often suffer damage and this result in increasing the cost of repair and maintenance. The maintenance cost for each machine is RM10 per unit, while the repair cost is RM30 per unit. **Table Q4** shows record that indicates this breakdown history on the machines.

Table Q4 : Breakdown history on the machines

Frequency of Preventive Maintenance	1	2	3	4
Probability of breakdown machine	0.1	0.2	0.3	0.4

Calculate :

(a) The expected numbers of breakdown.

(8 marks)

(b) The average number of damages per week.

(3 marks)

(c) The machine repairing cost per week.

(6 marks)

(d) The maintenance prevention cost per week.

(5 marks)

(e) The total cost per week.

(2 marks)

(f) Number of Preventive Maintenance performed.

(1 mark)

- END OF QUESTIONS -