UNIVERSITI TUN HUSSEIN ONN MALAYSIA

PEPERIKSAAN AKHIR
SEMESTER I
SESI 2011/2012

NAMA KURSUS	:	PENGURUSAN KEJURUTERAAN
KOD KURSUS	:	BPK 4023
PROGRAM	:	4 BEE
TARIKH PEPERIKSAAN	:	JANUARI 2012
JANGKA MASA	:	3 JAM
ARAHAN	:	JAWAB **EMPAT (4)** SOALAN SAHAJA DARIPADA LIMA (5) SOALAN
	:	HANTAR KERTAS JAWAPAN BERSAMA LAMPIRAN I

KERTAS SOALAN INI MENGANDUNGI **LIMA BELAS (15)** MUKA SURAT

S1 (a) Jelaskan bagaimana dengan menambah baik kualiti dapat menyumbang kepada penurunan kos.

(4 markah)

(b) Huraikan **DUA (2)** konsep untuk program Pengurusan Kualiti Menyeluruh yang efektif

(4 markah)

(c) Penggunaan elektrik di rumah perlu dikurangkan untuk tujuan penjimatan kos. **Jadual S1(c)** menunjukkan kos penggunaan setahun bagi sepuluh alat elektrik yang kerap digunakan di sesebuah rumah.

Jadual S1(c): Kos Penggunaan Elektrik Setiap Tahun untuk Setiap Peralatan.

Peralatan	**Kos/tahun (RM)**
Pembakar	28
Televisyen	60
Pengering	135
Pemanas air	496
Atas dapur	40
Lampu	251
Kipas siling	42
Peti Ais	68
Penghawa dingin	968
Ketuhar Gelombang Mikro	27

(i) Berdasarkan jadual S1(c), bina carta pareto penggunaan alat elektrik tersebut.

(10 markah)

(ii) Daripada carta pareto tersebut, syorkan penambahbaikan yang dapat dilakukan untuk mengurangkan penggunaan tenaga elektrik di rumah.

(2 markah)

(d) **Jadual S1(d)** menunjukkan jumlah ketidakhadiran di kalangan pelajar dan markah akhir mereka.

Jadual S1(d): Jumlah Ketidakhadiran di Kalangan Pelajar dan Markah Akhir.

Jumlah ketidakhadiran	Markah Akhir
0	96
1	91
2	78
2	83
3	75
3	62
4	70
5	68
6	56

(i) Bina gambarajah selerakan untuk data di **Jadual S1(d)**.

(4 markah)

(ii) Nyatakan kesimpulan daripada gambarajah selerakan tersebut.

(1 markah)

Q1 *(a)* *Explain how improving quality can lead to reducing cost.*

(4 marks)

(b) *Elaborate **TWO (2)** concepts for an effective Total Quality Management program.*

(4 marks)

(c) *To save money on the electricity usage, it is crucial to focus efforts on reducing the highest energy users at home.* ***Table Q1(c)*** *shows cost of consumption per year for each appliances.*

Table Q1(c): *Cost of Consumption per year for Each Appliances.*

Appliance	***Cost/year (RM)***
Oven	*28*
Television	*60*
Dryer	*135*
Water heater	*496*
Stove top	*40*
Lights	*251*
Ceiling fan	*42*
Refrigerator	*68*
Air-conditioner	*968*
Microwave	*27*

(iii) *Based from* ***Table Q1(c)****, develop a pareto chart of energy consumption for each appliances.*

(10 marks)

(iv) *From the pareto chart, suggest an improvement that can be made to reduce energy consumption.*

(2 marks)

(d) ***Table Q1(d)*** *shows the number of absences among student and their final grade.*

Table Q1(d): *Number of Absences Among Student and Their Final Grade.*

Number of Absences	***Final Grade***
0	*96*
1	*91*
2	*78*
2	*83*
3	*75*
3	*62*
4	*70*
5	*68*
6	*56*

(iii) *Construct a scatter diagram for the data given in* ***Table Q1(d)****.*

(4 marks)

(iv) *State the determined conclusion from the scatter diagram.*

(1 mark)

S2 (a) Jelaskan **EMPAT** (4) jenis inventori.

(4 markah)

(b) Bezakan di antara permintaan bersandar dan permintaan tidak bersandar mengikut skop pengurusan inventori.

(2 markah)

(c) Seorang pengurus di Syarikat Insuran Life telah menempah kepala surat daripada syarikat yang membekalkan alat tulis. Setiap kotak mengandungi 500 helai kepala surat. Syarikat tersebut menggunakan 6,500 kotak setahun. Kos menyimpan adalah 15% daripada harga sekotak. Manakala kos tempahan adalah sebanyak RM28. **Jadual S2(c)** menunjukkan harga diskaun yag diberikan oleh pembekal.

Jadual S2(c): Harga Diskaun yang Diberi oleh Pembekal.

Kuantiti Tempahan (kotak)	**Harga/kotak (RM)**
200 – 999	16
1,000 – 2,999	14
3,000 – 5,900	13
6,000+	12

Hitung *economic order quantity (EOQ)* dengan mengambil kira diskaun kuantiti yang diberikan oleh pembekal.

(16 markah)

(d) Syarikat Aida menghasilkan pemotong kertas yang sering digunakan di pejabat dan kedai yang menjual alat-alat seni lukis. Permintaan tahunan adalah sebanyak 6,750 unit. Secara puratanya, Aida menghasilkan 125 unit sehari. Kos permulaan (*setup cost*) mesin untuk menghasilkan pemotong kertas tersebut adalah sebanyak RM150. Kos menyimpan adalah sebanyak RM1 untuk setiap pemotong kertas. Syarikat Aida beroperasi selama 225 hari setahun.

Hitung:-

(i) *Economic production quantity (EPQ).*

(2 markah)

(ii) Jumlah hari penghasilan pemotong kertas.

(1 markah)

Q2 (a) *Explain **FOUR** (4) types of inventory.*

(4 marks)

(b) *Differentiate independent and dependent demand in a scope of inventory management.*

(2 marks)

(c) *The office manager for the Life Insurance Company orders letterhead from stationary supplier in boxes of 500 sheets. The company uses 6,500 boxes per year. The carrying costs are 15% from price of one box, and ordering costs are RM28. **Table Q2(c)** shows discount price schedule provided by the supplier.*

***Table Q2(c):** Discount Price Provided by the Supplier.*

Order Quantity (boxes)	***Price per Box (RM)***
200 – 999	*16*
1,000 – 2,999	*14*
3,000 – 5,900	*13*
6,000+	*12*

Calculate the economic order quantity (EOQ) considering the quantity discount offered by the supplier.

(16 marks)

(d) *Aida Company produces paper slicers used in offices and art stores. Annual demand is 6,750 units. On average, Aida produces 125 paper slicers per day. The setup cost for the equipment to produce the slicers is RM150. Carrying costs RM1 per paper slicer. Aida Company is operating 225 days per year.*

Calculate:-

(i) *Economic production quantity.*

(2 marks)

(ii) *Production run length*

(1 mark)

S3 (a) Ali adalah pengurus di sebuah kedai yang memasang alat komunikasi. Dia telah menerima tempahan sebanyak 50 modem. Setiap unit modem memerlukan 2 unit A, 1 unit B dan 4 unit C. Setiap unit A pula memerlukan 3 unit E dan 1 unit D. Manakala, setiap unit B memerlukan 2 unit D dan 3 unit F. Akhir sekali, setiap unit C memerlukan 2 unit E dan 2 unit D. Jadual S3(a) menunjukkan sela masa yang diperlukan untuk setiap komponen dan Jadual S3(b) menunjukkan jumlah inventori yang berada di syarikat.

(i) Bina *bill of material (BOM)* untuk menghasilkan 50 modem.

(7 markah)

(ii) Binakan perancangan *gross material requirement* dengan menggunakan maklumat yang diberi di **Jadual S3(a).**

Jadual S3(a): Sela Masa

Item	Sela Masa (minggu)
Modem	2
A	1
B	2
C	2
D	1
E	1
F	2

(4 markah)

(iii) Binakan perancangan net material requirement untuk setiap item dengan menggunakan maklumat daripada **Jadual S3(b).**
(Anda diminta menggunakan borang Material Requirement Planning (MRP) di Lampiran 1).

Jadual S3(b): Inventori di Kilang

Item	Inventori di Kilang
Modem	15
A	10
B	5
C	65
D	20
E	10
F	30

(14 markah)

Q3 *(a)* *Ali is a manager of a communication tools shop. He received an order for 50 modems. Each unit of the modem requires 2 units of A, 1 unit of B and 4 units of C. Each unit of A requires 3 units of E and 1 unit of D. Each unit of B requires 2 units of D and 3 units of F. Finally, each unit of C requires 2 units of E and 2 units of D. Table Q3 (a) shows the lead times and* ***Table Q3 (b)*** *shows the current on hand inventory.*

(i) *Construct the Bill of Material (BOM) for a production of 50 modems.*

(7 marks)

(ii) *Construct a gross material requirement plan using information from* ***Table Q3(a)***

Table Q3(a): *Lead Times*

Item	***Lead Time (weeks)***
Modem	*2*
A	*1*
B	*2*
C	*2*
D	*1*
E	*1*
F	*2*

(4 marks)

(iii) *Construct a net material requirement plan for each item using information from* ***Table Q3(b).***
(You are required to use Material Requirement Planning (MRP) form in Appendix I)

Table Q3(b): *On Hand Inventory*

Item	***On Hand Inventory***
Modem	*15*
A	*10*
B	*5*
C	*65*
D	*20*
E	*10*
F	*30*

(14 marks)

S4 (a) M. Cotteleer Company mempunyai lima kerja yang menunggu untuk diproses. Mereka mempunyai tiga pilihan dalam menyusun kerja-kerja tersebut sama ada menggunakan kaedah *First Come First Serve (FCFS), Shortest Processing Time (SPT), Earliest Due Date (EDD)* atau *Longest Processing Time (LPT).* **Jadual S4(a)** menunjukkan maklumat terperinci untuk setiap kerja tersebut.

Jadual S4(a): Anggaran Masa Memproses, Masa Permulaan (*Setup Cost*) dan Tarikh Akhir untuk Lima Kerja.

Kerja	Masa Permulaan (Jam)	Masa Memproses per Unit (Jam)	Jumlah Unit	Tarikh Akhir (Jam)
A	0.7	0.14	45	4
B	0.5	0.25	14	10
C	0.2	0.10	18	12
D	1.0	0.25	40	20
E	0.5	0.10	75	15

Cadangkan pilihan yang terbaik untuk menyusun kelima-lima kerja tersebut.

(20 markah)

(b) Terdapat lima kerja di sebuah syarikat pengeluaran yang perlu diproses melalui dua stesen kerja. Masa yang diperlukan untuk memproses setiap kerja ditunjukkan dalam **Jadual S4(b)**. Pengurus syarikat tersebut ingin menyusun kelima-lima kerja tersebut dengan meminimumkan jumlah masa memproses dengan menggunakan kaedah peraturan Johnson.

Jadual S4(b): Masa Memproses untuk Setiap Kerja

Kerja	Stesen 1	Stesen 2
A	10	4
B	6	12
C	16	8
D	20	14
E	14	24

Hitung:-

(i) Masa memproses untuk kelima-lima kerja melalui kedua-dua stesen kerja.

(4 markah)

(ii) Masa melahu untuk kedua-dua stesen kerja.

(1 markah)

Q4 (a) *M. Cotteleer Company has five jobs waiting to be processed through its liner department. There are three scheduling options; First Come First Serve (FCFS), Shortest Processing Time (SPT), Earliest Due Date (EDD or Longest Processing Time (LPT)) to be used in scheduling their jobs. The detail of the jobs are shown in* ***Table Q4(a):***

Table Q4(a): *Estimated Processing Times, Setup Time and Due Dates for Five Jobs*

Job	***Setup Time (Hour)***	***Processing Time per Unit (Hour)***	***Number of Unit***	***Due Date (Hour)***
A	*0.7*	*0.14*	*45*	*4*
B	*0.5*	*0.25*	*14*	*10*
C	*0.2*	*0.10*	*18*	*12*
D	*1.0*	*0.25*	*40*	*20*
E	*0.5*	*0.10*	*75*	*15*

Recommend the scheduling option that is the most superior.

(20 marks)

(b) *Five jobs at a manufacturing company must be processed through two work centers. The time for processing each job is shown in* ***Table Q4(b)****. The owner wants to set the sequence to minimize his total processing time for the five jobs by using Johnson's rule.*

Table Q4(b): *Time Processing for Each Job*

Job	***Line 1***	***Line 2***
A	*10*	*4*
B	*6*	*12*
C	*16*	*8*
D	*20*	*14*
E	*14*	*24*

Calculate:-

(i) Processing time for the five jobs through the two work centers.

(4 marks)

(ii) Total idle time for both work centers

(1 mark)

S5 (a) Teknik peramalan kualitatif adalah berguna dalam situasi di mana data yang sedia ada tidak mencukupi untuk penghasilan model matematik untuk menerangkan situasi kajian.

Terangkan **TIGA (3)** teknik peramalan kualitatif yang sering digunakan oleh penyelidik di industri.

(7 markah)

(b) Data di **Jadual S5(b)** menunjukkan jumlah jualan yang dicapai oleh M.A. Development Sdn. Bhd. daripada 1982 hingga 1996.

Jadual S5(b): Jumlah Jualan Yang Dicapai Oleh M.A. Development Sdn. Bhd. daripada 1982 Hingga 1996.

Tahun	Jualan (RM'000)
1982	48
1983	54
1984	62
1985	70
1986	80
1987	96
1988	109
1989	116
1990	117
1991	124
1992	137
1993	145
1994	148
1995	150
1996	152

Tentukan model peramalan yang terbaik untuk data-data tersebut daripada **DUA** (2) model yang disenaraikan di bawah

- 3-tempoh *moving average*
- *Single exponential smoothing* ($\alpha = 0.8$)

(18 markah)

Q5 (a) *Qualitative forecasting techniques is useful in situations where available data are insufficient to formulate the necessary mathematical model to represent the environment being investigated.*

Elaborate ***THREE*** *(3) qualitative forecasting techniques commonly used by researchers and industries.*

(7 marks)

(b) ***Table Q5(b)*** *indicates the amount of sales achieved by M.A. Development Sdn. Bhd. for the period from 1982 until 1996.*

Table Q5(b): *Amount of Sales Achieved by M.A. Development Sdn. Bhd. for the period 1982 until 1996.*

Year	*Sales (RM'000)*
1982	*48*
1983	*54*
1984	*62*
1985	*70*
1986	*80*
1987	*96*
1988	*109*
1989	*116*
1990	*117*
1991	*124*
1992	*137*
1993	*145*
1994	*148*
1995	*150*
1996	*152*

Determine the best forecast model for this data set from the TWO (2) models listed below.

- *3-period moving average*
- *Single exponential smoothing ($\alpha = 0.8$)*

(18 marks)

KERTAS SOALAN TAMAT
END OF QUESTION PAPER

PEPERIKSAAN AKHIR

SEMESTER/SESI : I/2011/2012 KURSUS : 4BEE
NAMA KURSUS : PENGURUSAN KEJURUTERAAN KOD KURSUS : BPK 4023

Lead Time	On Hand	Item ID		Period (week)								
				1	2	3	4	5	6	7	8	9
			Gross requirement									
			Scheduled receipt									
			Projected on hand									
			Net requirement									
			Planned order receipt									
			Planned order release									

Lead Time	On Hand	Item ID		Period (week)								
				1	2	3	4	5	6	7	8	9
			Gross requirement									
			Scheduled receipt									
			Projected on hand									
			Net requirement									
			Planned order receipt									
			Planned order release									

Lead Time	On Hand	Item ID		Period (week)								
				1	2	3	4	5	6	7	8	9
			Gross requirement									
			Scheduled receipt									
			Projected on hand									
			Net requirement									
			Planned order receipt									
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			Scheduled receipt									
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			Net requirement									
			Planned order receipt									
			Planned order release									