KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI

BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI
KEMENTERIAN PENDIDIKAN TINGGI

JABATAN KEJURUTERAAN MEKANIKAL

PEPERIKSAAN AKHIR

SESI II : 2023/2024

DJJ42022: INDUSTRIAL MANAGEMENT

TARIKH   : 28 MEI 2024
MASA   : 8.30 PAGI – 10.30 PAGI (2 JAM)

Kertas ini mengandungi **LAPAN (8)** halaman bercetak.

Struktur (4 soalan)

Dokumen sokongan yang disertakan : Formula

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

INSTRUCTION:
This section consists of **FOUR (4)** questions. Answer **ALL** questions.

ARAHAN:
*Bahagian ini mengandungi **EMPAT (4)** soalan. Jawab **SEMUA** soalan.*

QUESTION 1
SOALAN 1

CLO1   (a)   List **FIVE (5)** objectives of industrial management for effective organization.
               Senaraikan LIMA (5) objektif pengurusan industri bagi memastikan
               organisasi yang efektif.

[5 marks]
[*5 markah*]

CLO1   (b)   Explain **TWO (2)** problems faced in industrial management.
               Terangkan DUA (2) masalah yang dihadapi dalam pengurusan industri.

[5 marks]
[*5 markah*]

CLO2 (c)   ABC Sdn. Bhd. conducted an operation using four elements. Each element was observed three times and the following **Table 1(c)**'s the recorded data. The allowance factor of 10% is taken as a fraction of the entire work day, calculate:

ABC Sdn. Bhd. menjalankan operasi dengan menggunakan empat elemen. Setiap elemen mempunya tiga pemerhatian seperti dalam Jadual 1(c). Dengan menggunakan faktor kelegaan 10% diambilkira menerusi hari bekerja berkenaan, kirakan:

Table 1(c): Observation data (in minutes)

Jadual 1(c): Data Pemerhatian (dalam minit)

Element	Observation cycles (in minutes)			Performance Rating
	1	2	3	
A	8	10	9	120%
B	2	3	2	105%
C	2	2	2	110%
D	4	7	6	110%

i.   The normal time for the operation

Masa normal bagi operasi ini

[12 marks]

[*12 markah*]

ii.   The standard time for the operation

Masa standard bagi operasi ini

[3 marks]

[*3 markah*]

QUESTION 2

SOALAN 2

CLO2

(a) The benefits of inventory are to create a smooth and uninterrupted production. Explain **TWO (2)** types of inventory.

Di antara kelebihan inventori adalah untuk menghasilkan kelancaran pengeluaran produk tanpa gangguan. Terangkan DUA (2) jenis inventori.

[5 marks]

[5 *markah*]

CLO2

(b) Sketch a graph of annual cost againts the order quantity in which consisting of total cost curve, holding cost and setup cost lines.

Lakarkan graf kos tahunan melawan kuantiti pesanan yang terdapat garisan lengkungan jumlah kos, kos pegangan dan kos persediaan.

[5 marks]

[5 *markah*]

CLO2

(c) The XY manufacturing company offers as in **Table 2(c)** to its customers. The ordering cost is RM49 per order, the annual demand is 5000 units and the annual holding cost charge is 20%. Analyze the quantity and the price that gives the lowest total inventory cost.

Sebuah syarikat pembuatan XY menawarkan tawaran pada pelanggannya seperti di Jadual 2(c). Kos pesanan adalah sebanyak RM49 setiap pesanan, permintaan tahunan adalah 5000-unit dan caj kos pegangan adalah 20%. Analisa kuantiti dan harga yang memberikan jumlah kos inventori yang paling rendah.

Table 2(c)

Jadual 2(c)

Quantity	Unit price (P)
0 to 999	RM5.00
1000 to 1999	RM4.80
2000 to over	RM4.75

[15 marks]

[*15 markah*]

QUESTION 3

SOALAN 3

CLO2

(a) Scheduling deals with the timing of operations. The objective of scheduling is to allocate and prioritize demand to available facilities. Explain **ONE (1)** factor that affects scheduling and **THREE (3)** benefits of scheduling.

*Penjadualan berkaitan dengan masa operasi. Objektif penjadualan adalah untuk memperuntukkan dan mengutamakan permintaan kepada kemudahan yang ada. Terangkan **SATU (1)** faktor yang mempengaruhi penjadualan dan **TIGA (3)** faedah penjadualan.*

[5 marks]

[*5 markah*]

CLO2

(b) A group of six jobs will be processed through two-machines as a workstation. The first operation involves grinding and the second involves welding. Construct a sequence that will minimize the total completion time for this group of jobs. Processing time are as in a **Table 3(b).**

Sebanyak enam kerja akan diproses melalui dua mesin sebagai stesen kerja. Operasi pertama melibatkan kerja-kerja mengisar dan yang kedua melibatkan kimpalan. Bina susunan yang dapat meminimumkan jumlah masa siap keseluruhan untuk kumpulan kerja ini. Masa pemprosesan adalah seperti Jadual 3(b).

Table 3(b): Processing Time for two workstations

Jadual 3(b): Masa Pemprosesan bagi 2 stesen kerja

Job	Processing Time (hours)	
	Workstation 1	**Workstation 2**
A	5	5
B	4	3
C	8	9
D	2	7
E	6	8
F	12	15

[8 marks]

[*8 markah*]

CLO2

(c) Five engine blocks are waiting for processing. The processing time has been estimated. The expected completion time has been agreed. Table 3(c) shows the situations on Monday morning. The customer pick up time is measured in business hours from Monday morning. By using the FCFS rules, determine:

Lima blok enjin sedang menunggu untuk diproses. Masa pemprosesan telah dianggarkan. Jangkaan masa siap telah dipersetujui. Jadual 3(c) menunjukkan situasi pada pagi Isnin. Masa pengambilan pelanggan diukur dalam waktu perniagaan dari pagi Isnin. Dengan menggunakan peraturan FCFS, tentukan:

Table 3(c)

Jadual 3(c)

Job (Engine)	Job work (processing time) (days)	Job due date (Days) (customer pick up time)
A	6	8
B	2	6
C	8	18
D	3	15
E	9	23

i.   Average completion time

Purata masa siap

[4 marks]

[4 markah]

ii.   Utilization

Penggunaan

[4 marks]

[4 markah]

iii.   Average number of jobs in the system

Purata bilangan pekerjaan dalam system

[4 marks]

[4 markah]

QUESTION 4

SOALAN 4

CLO1

(a) Define the following terms:

Berikan maksud istilah berikut:

i.   Quality

Kualiti   [1 mark]

[1 markah]

ii.   Quality management

Pengurusan kualiti

[2 mark]

[2 markah]

iii.   Total quality management

Pengurusan kualiti menyeluruh

[2 mark]

[2 markah]

CLO1

(b) ISO 9000 has five international standards on quality management. Explain

FIVE (5) quality standards used in industry.

ISO 9000 mempunyai lima piawaian antarabangsa pada pengurusan kualiti.

*Terangkan **LIMA (5)** piawai kualiti yang digunakan di industri.*

[10 marks]

[10 markah]

CLO1

(c) Provide **FOUR (4)** steps in human resource management.

*Berikan **EMPAT (4)** langkah dalam pengurusan sumber manusia.*

[10 marks]

[10 markah]

SOALAN TAMAT

FORMULA
DJJ42022: INDUSTRIAL MANAGEMENT

1. Work System Design:

Normal time = Observed time × rating factor

Standard time = Normal time / (1-Allowance)

@Standard Time = normal time x allowance factor

2. EOQ Equations:

$Q_{OPT} = \sqrt{\frac{2DS}{H}}$

Reorder Point, $R = d . L$

No. of order, $N = \dfrac{Demand}{Order\ Quantity}$

Total Cost $= \dfrac{D}{Q}S + \dfrac{Q}{2}H$

3. EPQ Equations:

$EPQ = \sqrt{\dfrac{2DS}{H\left(1 - \dfrac{d}{p}\right)}}$

$I_{MAX} = Q\left(1 - \dfrac{d}{p}\right)$

$TC_{EPQ} = \left(\dfrac{D}{Q}S\right) + \left(\dfrac{I_{MAX}}{2}H\right)$

4. Quantity Discount Model:

Total Cost $= \dfrac{D}{Q}S + \dfrac{Q}{2}H + PD$

$Q^* = \sqrt{\dfrac{2DS}{IP}}$ or $Qopt = \sqrt{\dfrac{2DS}{H}}$

Annual product cost: P*D

Annual ordering cost: (D/Q)*S

Annual holding cost: (Q/2)*IP

5. Priority Rule:

Average completion time $= \dfrac{flow\ time}{no.\ of\ job}$

Average number of job at the work center $= \dfrac{flow\ time}{processing\ time}$

Average job lateness $= \dfrac{late\ time}{no.of\ job}$

Critical ratio= due date/processing time

CR = time remaining / works day remaining