SULIT

KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI

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

JABATAN KEJURUTERAAN AWAM

PEPERIKSAAN AKHIR

SESI I : 2024/2025

DCW30112 : INDUSTRIAL STATISTICS

TARIKH : 3 DISEMBER 2024
MASA : 8.30 PAGI – 10.30 PAGI (2 JAM)

Kertas ini mengandungi **SEMBILAN (9)** halaman bercetak.
Bahagian A: Struktur (2 soalan)
Bahagian B: Struktur (4 soalan)

Dokumen sokongan yang disertakan : Formula, Kertas Graf

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SECTION A : 50 MARKS

BAHAGIAN A : 50 MARKAH

INSTRUCTION:
This section consists of **TWO (2)** structured questions. Answer **ALL** questions.
ARAHAN:
*Bahagian ini mengandungi **DUA(2)** soalan struktur. Jawab **SEMUA** soalan.*

QUESTION 1
SOALAN 1

(a) Explain statistics techniques for data analysis.
Terangkan teknik statistik bagi menganalisis data

[5 marks]
[5*markah*]

CLO1

(b) Discuss **FIVE (5)** techniques of non-probability sampling.
*Bincangkan **LIMA (5)** teknik bukan kebarangkalian persampelan*

[10 marks]
[10 *markah*]

CLO1

(c) In designing a questionnaire, there are a few things which should be taken into consideration to achieve the target of the survey. Interpret **FIVE (5)** things that should be taken into consideration in designing a good questionnaire.
*Dalam merekabentuk borang soalselidik, terdapat perkara yang perlu diambilkira untuk mencapai tujuan kajian. Perincikan **LIMA (5)** perkara yang perlu diambil kira di dalam merekabentuk soalselidik yang baik.*

[10 marks]
[10 *markah*]

QUESTION 2
SOALAN 2

CLO1

(a) For the frequency distribution below, Determine the first quartile and third quartile score of 45 students who sat for a Quantitative Method Test.
Untuk taburan kekerapan dibawah, Tentukan skor kuartil pertama dan ketiga bagi 45 orang pelajar yang menduduki Ujian Kaedah Kuantitatif.

Score (x)	40	50	55	60	70
Number of students (f)	10	12	15	5	3

Table A2 / *Jadual A2*

[5 marks]
[5*markah*]

CLO1

(b) The age distribution for a computer sample in a college is as follows:
Taburan unur bagi sampel komputer dalam kolej seperti berikut:

Age, x (months)	21–25	26–30	31–35	36–40	41–45	46–50	51–55	56–60	61-65
Number of computers, f	*10*	*15*	*16*	*5*	*8*	*10*	*3*	*12*	*4*

Table A2b/ Jadual A2b

Calculate the variance and standard deviation for age of computer
Kira varian dan sisihan piawai bagi umur kompute.

[10 marks]
[10 *markah*]

CLO1

(c) Explain the rules of probability.
Terangkan peraturan-peraturan kebarangkalian

[10 marks]
[10 *markah*]

SECTION B : 50 MARKS

BAHAGIAN B : 50 MARKAH

INSTRUCTION:
This section consists of **FOUR (4)** structured questions. Answer **TWO (2)** questions only.

QUESTION 1
SOALAN 1

CLO1

(a) There are several methods of collecting data and each has its own advantages and disadvantages. Identify **FIVE (5)** common methods of data collection.
*Terdapat beberapa kaedah mengumpulkan data dan masing-masing mempunyai kelebihan tersendiri dan kekurangan. Kenalpasti **LIMA (5)** kaedah umum pengumpulan data.*

[10 marks]
[10 *markah*]

CLO1

(b) A school has 650 students who need to take foreign language courses. Table B1(b) shows the number of students who take Chinese, Japanese, German and French. An examiner wants to look at the work of a stratified sample of 70 of these students.
Sebuah sekolah mempunyai 650 pelajar yang perlu mengambil kursus bahasa asing. Jadual B1(a) menunjukkan bilangan pelajar yang mengambil bahasa Cina, Jepun, Jerman dan Perancis. Pemeriksa mahu melihat kerja sampel berstrata untuk 70 pelajar ini.

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Language	Number of students
Chinese	145
Japan	121
German	198
French	186

Table B1(a)/ *Jadual B1(a)*

CLO1

i. Explain the meaning of stratified sampling.
Terangkan maksud persampelan berstrata

[7 marks]
[7 *markah*]

i. Calculate the number of students from each of the foreign language course that needs to be taken as a sample.

Kirakan jumlah pelajar dari setiap kursus bahasa asing yang perlu diambil sebagai sampel .

[8 marks]
[8 *markah*]

QUESTION 2
SOALAN 2

CLO1

(a) Data presentation is an essential step before further statistical analysis is carried out. Illustrate **FOUR (4**) appropriate data presentations commonly used in statistics.
*Persembahan data adalah langkah asas sebelum analisis statistik dijalankan lebih jauh. Lakarkan **EMPAT (4)** jenis persembahan data yang biasa digunakan dalam statistik.*

[10 marks]
[*10 markah*]

CLO1

(b) Table B2(b) below shows the number of students in a class who all fell asleep after the lecture started.
Jadual B2(b) di bawah menunjukkan bilangan pelajar dalam kelas yang tertidur setelah kuliah bermula.

Time (minutes)	Number of students
$1 \leq x < 6$	0
$6 \leq x < 11$	3
$11 \leq x < 16$	4
$16 \leq x < 21$	7
$21 \leq x < 26$	4
$26 \leq x < 31$	8
$31 \leq x < 36$	6

Table B2(b) / *Jadual B2(b)*

CLO1

i. Construct a frequency distribution table with class boundaries, cumulative frequency and relative frequency.
Bina jadual taburan kekerapan dengan sempadan kelas, kekerapan kumulatif dan kekerapan relatif

[7 marks]
[7 *markah*]

ii. By using data gathered from 2b(i), construct a "less than' ogive on a graph paper.
Dengan menggunakan data dalam yang diperolehi dari 2b(i), bina ogif "kurang daripada' pada kertas graf.

[8 marks]
[8 *markah*]

QUESTION 3
SOALAN 3

CLO1 (a) Identify variance and standard deviation of the highest temperatures (in Fahrenheit) recorded in eight specific states:
Kenalpasti varians dan sisihan piawai bagi suhu tertinggi (dalam Fahrenheit) direkodkan dalam lapan keadaan tertentu:

110, 100, 127, 120, 134, 118, 105, 112.

[10 marks]
[*10 markah*]

CLO1 (b) Table B3(b) shows time to travel to work (in minutes) for staff in a company
Jadual B3(b) *menunjukkan masa perjalanan ke tempat kerja (dalam minit) untuk kakitangan di sebuah syarikat.*

Time (minutes)	Number of staff
1 - 10	8
11 - 20	14
21 - 30	12
31 - 40	9
41 -50	7

Table B3 (b)/*Jadual B3 (b)*

Calculate,
Kira.

i. Median / *Median*

[7 marks]
[*7 markah*]

ii. Mean and Mode / *Purata dan Mod*

[8 marks]
[*8 markah*]

QUESTION 4
SOALAN 4

(a) Identify how many different permutations can be formed from the following words. CLO1

Nyatakan jumlah pilih atur yang dapat dibentuk dari perkataan berikut.

i. SARAWAK / *SARAWAK*

ii. DRAMA / *DRAMA*

iii. DIGITAL / *DIGITAL*

iv. XIAOMI / *XIAOMI*

[10 marks]

[*10 markah*]

(b) Mr Hamdi uses his car 30% of the time, walks 30% of the time and rides the bus 40% of the time as he goes to work. He is late 10% of the time when he walks: he is late 3% of the time when he drives; and he is late 7% of the time he takes the bus.

Mr Hamdi menggunakan keretanya 30% sepanjang masa, berjalan 30% sepanjang masa dan menaiki bas 40% sepanjang masa semasa dia pergi ke tempat kerja. Dia lewat 10% masa dia berjalan; dia lewat 3% daripada masa dia memandu; dan dia lewat 7% daripada masa dia menaiki bas.

i. Construct a tree diagram for the above information.

Bina gambarajah pokok untuk maklumat di atas.

[7 marks]

[7 *markah*]

ii. Calculate the probability that Mr. Hamdi will be late for work if he takes the bus. Then, if Mr. Hamdi arrives on time, calculate the probability that he walks to work.

Kira kebarangkalian Encik Hamdi sampai lewat ke tempat kerja jika dia menaiki bas. Kemudian, jika En Hamdi tiba pada masa yang tepat, kira kebarangkalian dia berjalan kaki ke tempat kerja.

[8 marks]

[8 *markah*]

SOALAN TAMAT

DCW 30112 Industrial Statistics Formula

1. $K = \frac{\log n}{\log 2}$
2. $mean\ (x) = \frac{\sum x}{N}$ ungrouped data
3. $mean\ (x) = \frac{(\sum fx)}{\sum f}$ grouped data
4. $mode = L_b + \left(\frac{d_1}{d_1+d_2}\right)$ grouped data
5. $median = L_b + \left[\frac{\frac{n}{2}-Cfb}{fm}\right] \times c.i$
6. $Q_1 = L_B + \left[\frac{\frac{n}{4}-Cfb}{f_{Q1}}\right] \times c.i$
7. $Q_3 = L_B + \left[\frac{\frac{3n}{4}-Cfb}{f_{Q1}}\right] \times c.i$
8. $Quartile\ range = Q_3 - Q_1$
9. $Quartile\ deviation = \frac{1}{2}(Q_3 - Q_1)$
10. $D_k = L_b + \left[\frac{\frac{kn}{10}-Cfb}{f_{D_k}}\right] \times c.i$
11. $P_k = L_b + \left[\frac{\frac{kn}{100}-Cfb}{f_{P_k}}\right] \times c.i$
12. Sample ungrouped data

$$s^2 = \frac{1}{n-1}\sum(x^2 - \frac{(\sum x)^2}{n})$$

$$S = \sqrt{\frac{1}{n-1}\sum(x^2 - \frac{(\sum x)^2}{n})}$$

13. Sample grouped data

$$s^2 = \frac{1}{n-1}\sum\left[f{x_m}^2 - \frac{(\sum fx_m)^2}{n}\right]$$

$$s = \sqrt{\frac{1}{n-1}\sum(f{x_m}^2 - \frac{(\sum fx_m)^2}{n})}$$

14. Mean deviation = $\frac{\sum[x-mean]}{n}$ ungrouped data