SULIT

POLITEKNIK MALAYSIA

BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK
KEMENTERIAN PENDIDIKAN TINGGI

JABATAN KEJURUTERAAN AWAM

PEPERIKSAAN AKHIR

SESI DISEMBER 2017

DCW3162: INDUSTRIAL STATISTICS

TARIKH : 02 APRIL 2018
MASA : 2.30 PETANG – 4.30 PETANG (2 JAM)

Kertas ini mengandungi **SEMBILAN (9)** halaman bercetak.

Bahagian A: Struktur (2 soalan)
Bahagian B: Struktur (4 soalan)

Dokumen sokongan yang disertakan : Kertas Graf, Formula

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)** structure questions. Answer **ALL** questions.

ARAHAN:

*Bahagian ini mengandungi **DUA (2)** soalan struktur. Jawab **SEMUA** soalan.*

QUESTION 1

SOALAN 1

CLO 1
C1

a) Define each of the following terms:

Berikan definisi bagi istilah-istilah berikut:

i. sample survey / *tinjauan sampel*

ii. discrete variable / *pembolehubah diskrit*

iii. sample /*sampel*

iv. population / *populasi*

v. data / *data*

[5 marks]

[5 *markah*]

CLO 1
C2

b) Describe why a pilot test should be carried out before the actual research conducted.

Huraikan mengapa kajian rintis perlu dilaksanakan dahulu sebelum kajian sebenar dijalankan.

[10 marks]

[10 markah]

CLO 1
C3

c) The data below shows the marks scored by ten students in Pollution Management test.

Data di bawah menunjukkan skor markah bagi sepuluh orang pelajar dalam ujian Pengurusan Pencemaran.

45 50 55 65 66 70 70 70 75 80

Calculate the mean, median and mode.

Kirakan purata, median dan mod.

[10 marks]

[10 *markah*]

QUESTION 2

SOALAN 2

CLO 1
C2

a) Identify the first quartile and third quartile score of 40 students who sat for a Quantitative Method Test, based on the following frequency distribution table.

Kenal pasti skor kuartil pertama dan kuartil ketiga bagi 40 orang pelajar yang menduduki Ujian Kaedah Kuantitatif, berdasarkan jadual taburan kekerapan berikut.

Table Q2a

Score (x)	10	15	20	25	30
Number of students (f)	8	10	12	5	5

[5 marks]

[5 *markah*]

CLO 1
C3

b) The following data shows the distribution of monthly income obtained from a survey on 120 workers in Kulim Industrial Area.

Data berikut menunjukkan agihan pendapatan bulanan yang diperolehi daripada kajian terhadap 120 orang pekerja di Kawasan Perindustrian Kulim.

Table Q2b

Income (RM)	Number of workers, f
200 and less than 300	4
300 and less than 400	18
400 and less than 500	25
500 and less than 600	43
600 and less than 700	20
700 and less than 800	7
800 and less than 900	3

Calculate the mean, median and mode for the monthly income of the workers.

Kirakan min, median dan mod bagi pendapatan bulanan pekerja.

[15 marks]

[15 *markah*]

CLO 1
C1

c) State the rules of probability.

Nyatakan peraturan-peraturan kebarangkalian.

[5 marks]

[5 *markah*]

SECTION B : 50 MARKS

BAHAGIAN B: 50 MARKAH

INSTRUCTION:

This section consists of **FOUR (4)** structure questions. Answer **TWO (2)** questions.

ARAHAN:

*Bahagian ini mengandungi **EMPAT (4)** soalan struktur. Jawab **DUA (2)** soalan.*

QUESTION 1

SOALAN 1

CLO 1
C1

a) Describe each of the following terms;

Huraikan setiap satu istilah berikut;

i. primary data / *data primer.*

ii. secondary data / *data sekunder.*

iii. population / *populasi.*

iv. pilot study / *kajian rintis.*

[10 marks]

[10 *markah*]

CLO 1
C3

b) A researcher plans to carry out a study on Cumulative Grade Point Average (CGPA) for Politeknik Kota Kinabalu's final semester students. The breakdown is based on three academic departments in PKK as shown in **Table Q1b.**

*Seorang penyelidik merancang untuk menjalankan kajian ke atas Himpunan Purata Nilai Mata (HPNM) bagi pelajar semester akhir Politeknik Kota Kinabalu. Pecahan adalah mengikut tiga jabatan akademik di PKK seperti yang ditunjukkan dalam **Jadual Q1b.***

Table Q1b

Academic Department	Number of final semester students
Civil Engineering Department	200
Electrical Engineering Department	140
Mechanical Engineering Department	160

The researcher select randomly 20% of the final semester students from each department.

Penyelidik bercadang memilih secara rawak 20% pelajar semester akhir bagi setiap satu jabatan.

i. State the population of the study.
Nyatakan populasi bagi kajian ini.

ii. List variables of interest.
Senaraikan pembolehubah kajian.

iii. Choose the sampling techniques used by the researcher.
Pilih teknik persampelan yang digunakan oleh penyelidik.

iv. Calculate the number of final semester students needed for each department in this study.
Kirakan bilangan pelajar semester akhir bagi setiap jabatan yang diperlukan dalam kajian ini.

v. Interpret the suitable data collection method for the researcher. Give two advantages of using this method.
Kenalpasti kaedah pengumpulan data yang sesuai bagi penyelidik. Berikan dua kelebihan menggunakan kaedah tersebut.

[15 marks]
[15 *markah*]

QUESTION 2

SOALAN 2

CLO 1 C2

a) Quantitvative data are summarized in tabular form by using frequency table and cumulative frequency distribution. Data are usually presented using histogram, stem-and-leaf plots, and ogive. Explain histogram.

Data kuantitatif diringkaskan dalam bentuk jadual dengan menggunakan jadual kekerapan dan taburan kekerapan kumulatif. Data biasanya dipersembahkan dalam bentuk histogram, plot batang dan daun, dan ogif. Terangkan histogram.

[10 marks]

[10 *markah*]

CLO 1 C3

b) A study was conducted to obtain the growth rate of acacia seedlings in nurseries. **Table Q2b** shows the height (in millimeter) of 30 seedlings after ten months of planting.

Satu kajian telah dijalankan untuk mendapatkan kadar pertumbuhan anak pokok akasia di tapak semaian. ***Jadual Q2b*** *menunjukkan ketinggian (dalam milimeter) 30 anak pokok selepas sepuluh bulan di tanam.*

Table Q2b

25	55	46	50	38	30	20	30	59	75
45	20	25	20	35	22	40	70	28	61
28	65	66	43	57	25	33	57	23	22

i. Calculate the number of classes, data range and class width for the above data.

Kirakan bilangan kelas, julat data dan lebar kelas bagi data di atas.

ii. Illustrate a frequency distribution table.

Lakarkan jadual taburan kekerapan.

iii. Draw a histogram from the above data.

Lukiskan histogram dari data di atas.

[15 marks]

[15 *markah*]

QUESTION 3

SOALAN 3

CLO 1 C2

a) A sample of 10 students in PKK showed the following credit hours taken during the third semester of their programme.

Satu sampel seramai 10 orang pelajar PKK menunjukkan jam kredit yang di ambil semasa semester tiga dalam program mereka.

17 18 21 18 20 19 22 21 18 24

Calculate the mean, median and mode.

Kirakan min, median dan mod.

[10 marks]

[*10 markah*]

CLO 1 C3

b) A company that run an online retail fashion items needs to know the typical weekly sales in order to plan for inventory. The company selects 10 weeks at random from the past year's sales record and obtain the data (in RM '000) as shown below.

Sebuah syarikat yang menjalankan perniagaan barangan fesyen atas talian ingin tahu jualan mingguan biasa untuk merancang inventori. Syarikat memilih 10 minggu secara rawak dari rekod jualan tahun lalu dan memperoleh data (dalam RM '000) seperti yang ditunjukkan di bawah.

135 118 122 122 131 122 125 127 128 123

i. Calculate the first quartile, median and the third quartile.
Kirakan kuartil pertama, median dan kuartil ketiga.

ii. Calculate mean and mode.
Kirakan min dan mod.

iii. Illustrate the skewness distribution based on answer **b (ii).**
*Lakarkan taburan lengkung berdasarkan jawapan pada **b (ii).***

[15 marks]

[*15 markah*]

QUESTION 4

SOALAN 4

CLO 1 C2

a) A dice is rolled and a coin is tossed. Determine the probability that the dice shows an odd number and the coin shows a head.
Sebiji dadu dilambung dan sekeping syiling dibuang. Tentukan kebarangkalian dadu menunjukkan nombor genap dan syiling menunjukkan kepala.

[10 marks]
[10 *markah*]

CLO 1 C3

b) It was raining one third of a day in Miri. Given that if it is raining, there will be a heavy traffic with probability of ½. While if it is not raining, the probability of heavy traffic is ¼. If it is raining and there is heavy traffic, Alisa will be arriving late for work with probability of ½. On the other hand, the probability of being late reduce to 1/8 if it is not raining and there is no heavy traffic. In other situation (raining and no traffic, not raining and traffic) the probability of being late is 0.25.
Bandar Miri hujan satu pertiga dalam sehari. Diberi jika berlaku hujan, trafik sesak akan berlaku dengan kebarangkalian ½. Manakala jika tidak hujan, kebarangkalian trafik sesak adalah ¼. Jika berlaku hujan dan trafik sesak, Alisa akan lewat sampai ke tempat kerja dengan kebarangkalian ½. Sebaliknya, kebarangkalian lewat sampai berkurang kepada 1/8 jika tidak hujan dan tidak sesak. Dalam situasi lain (hujan dan tidak sesak, tidak hujan dan sesak) kebarangkalian lewat adalah 0.25.

i. Illustrate tree diagram for the above situation.
Lakarkan gambarajah pokok bagi situasi di atas.

ii. Calculate the probability if it is not raining, there is a heavy traffic and Alisa is not late.
Kirakan kebarangkalian jika tidak hujan, trafik sesak dan Alisa tidak lewat.

iii. Calculate the probability that Alisa is late to work.
Kirakan kebarangkalian Alisa lewat ke tempat kerja.

[15 marks]
[15 *markah*]

SOALAN TAMAT

FORMULA

DCW3162 : INDUSTRIAL STATISTICS

i. $K = 1 + \log_{10}(n)$

ii. $x = \frac{\sum_{i=1}^{n} x_i}{n}$

iii. $x = L_m + \left[\frac{\frac{n}{2} - \sum f_{fm-1}}{f_m}\right] \times c$

iv. $x = L_m \left(\frac{\Delta_1}{\Delta_1 + \Delta_2}\right) \times c$

v. $x = \frac{n+1}{4}$

vi. $x = L_1 + \left[\frac{\frac{n}{4} - \sum f_{bq-1}}{f_1}\right] \times c$

vii. $D_k = L_m + \left[\frac{k\frac{n}{10} - \sum f_{BD_1}}{f_{D_1}}\right] \times c$

viii. $P_k = L_{BK} + \left[\frac{k\frac{n}{100} - \sum f_{Bk_1}}{f_{BK_1}}\right] \times c$

ix. $s^2 = \frac{1}{n-1} \sum [x - \bar{x}]^2$

x. $s^2 = \frac{1}{\sum f - 1} \left[\sum f x^2 - \frac{(\sum f x)^2}{\sum f}\right]$

xi. $s = \sqrt{s^2}$

xii. mean deviation $= \frac{\sum |x - mean|}{n}$, $\frac{1}{\sum f} [\sum f |x - \bar{x}|]$