SULIT

POLITEKNIK MALAYSIA

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

JABATAN KEJURUTERAAN AWAM

PEPERIKSAAN AKHIR

SESI JUN 2018

DCC3132 : STATISTICS

TARIKH : 27 OKTOBER 2018
MASA : 2.30PETANG – 4.30PETANG (2 JAM)

Kertas ini mengandungi **EMPAT BELAS (14)** halaman bercetak.
Bahagian A: Struktur (2 soalan)
Bahagian B: Struktur (4 soalan)

Dokumen sokongan yang disertakan : Kertas Graf dan 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)** structured questions. Answer **ALL** questions.

ARAHAN :

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

QUESTION 1

SOALAN 1

CLO1
C1

(a) Define the following terms:

Takrifkan terma-terma yang berikut:

i) Descriptive statistics.

Statistik deskriptif.

ii) Inferential statistics.

Statistik inferens.

[5 marks]

[*5 markah*]

CLO1
C2

(b) Classify each of the following as qualitative variable or quantitative variable.

Kelaskan setiap pernyataan dibawah sama ada pembolehubah kualitatif atau pembolehubah kuantitatif.

i) The colour of automobiles involved in several major accidents.

Warna kenderaan yang terlibat dalam beberapa kemalangan yang ngeri.

ii) The length of time required for a rat to move through a hole.

Tempoh masa yang diperlukan untuk seekor tikus bergerak menerusi lubang.

iii) The rating given to a pizza in taste as poor, good or excellent.

Penilaian yang diberikan pada sekeping pizza sama ada rasanya tidak sedap, sedap atau sangat sedap.

iv) The number of faculty in Universiti Teknologi Malaysia.

Bilangan fakulti di Universiti Teknologi Malaysia.

v) The number of individual with type A blood.

Bilangan individu yang mempunyai darah jenis A.

[10 marks]

[*10 markah*]

CLO1 C3

(c) Choose the scale of measurement for each of the following variables **(NOMINAL/ ORDINAL/ INTERVAL/ RATIO)**

Pilih skala pengukuran untuk setiap pembolehubah ***(NOMINAL/ ORDINAL/ INTERVAL/ NISBAH)***

i) Religion classification.

Klasifikasi bagi agama.

ii) Movie ratings of 1,2,3 or 4 stars.

Penilaian filem sama ada 1,2,3 atau 4 bintang.

iii) Body temperature.

Suhu badan.

iv) Weights of runners.

Berat pelari-pelari.

v) Consumer product ratings given as poor, average or excellent.

Penilaian produk yang diberikan oleh pengguna sama ada lemah, sederhana atau amat baik.

[10 marks]

[*10 markah*]

QUESTION 2

SOALAN 2

CLO2
C1

(a) Identify **FIVE (5)** types of data presentation.

*Tentukan **LIMA (5)** jenis persembahan data.*

[5 marks]

[*5 markah*]

CLO2
C2

(b) A survey has been conducted on 200 respondents that has been chosen randomly. Each respondent are required to name their favourite sport. The pie chart in **Figure A2(b)** summarizes result of this survey. Calculate the number of individual for each Sport.

*Satu soal selidik telah dijalankan ke atas 200 orang correspondent yang terpilih secara rawak. Setiap correspondent dikehendaki menamakan sukan kegemaran mereka. Carta pai pada **Rajah A2(b)** menunjukkan keputusan akhir kajian ini.Kirakan bilangan individu bagi setiap acara sukan.*

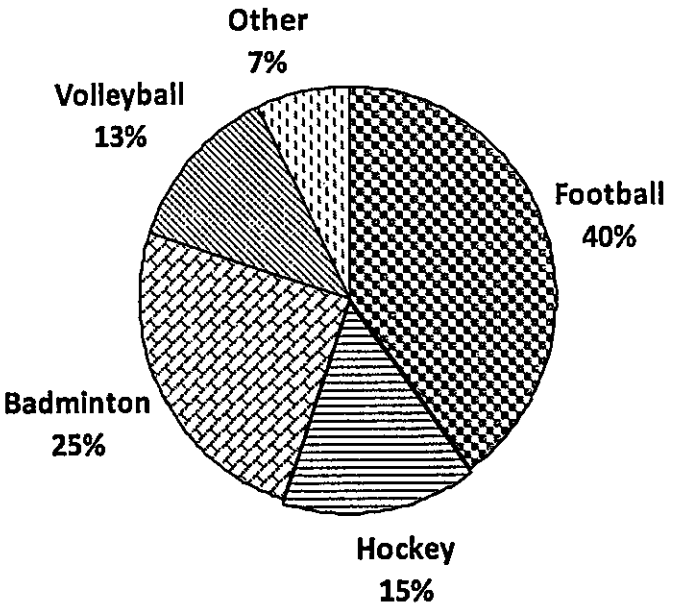

Figure A2(b) / *Rajah A2(b)*

[10 marks]

[*10 markah*]

CLO2
C3

(c) **Table A2(c)** shows the enrolment in a college of engineering. Draw a bar chart based on **Table A2(c)**.

Jadual A2(c) *menunjukkan enrolmen bagi sebuah kolej kejuruteraan. Lukis carta bar berdasarkan* ***Jadual A2(c).***

Table A2(c) / ***Jadual A2(c)***

Year/*Tahun*	2015	2016	2017	2018
Enrolment/*Enrolmen*	200	180	215	250

[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.

ARAHAN :
*Bahagian ini mengandungi **EMPAT (4)** soalan berstruktur. Jawab **DUA (2)** soalan sahaja.*

QUESTION 1
SOALAN 1

CLO1 C1

(a) i) Define sampling.
Definisikan maksud pensampelan.

[2 marks]
[*2 markah*]

ii) Identify **THREE (3)** types of probability sampling technique.
*Tentukan **TIGA (3)** jenis teknik pensampelan kebarangkalian.*

[3 marks]
[*3 markah*]

CLO1 C2

(b) i) One of the methods of collecting primary data is by direct interview. Explain briefly the advantage and disadvantage of this data collection method.
Salah satu kaedah untuk mendapatkan data primer adalah dengan kaedah temubual secara langsung. Terangkan secara ringkas kebaikan dan keburukan mengumpul data menggunakan kaedah ini.

[4 marks]
[*4 markah*]

CLO1 C2

(b) ii) Identify **SIX (6)** basic steps in Statistical Problem Solving.

*Tentukan **ENAM (6)** langkah asas dalam Penyelesaian Masalah Statistik.*

[6 marks]
[*6 markah*]

CLO1 C3

(c) In designing a questionnaire, there are a few things which should be taken into consideration to achieve the target of the survey. Interprate **FIVE (5)** things should be taken into consideration to design a good questionnaire.
*Dalam merekabentuk borang soal-selidik, beberapa prosedur perlu diambil kira dalam mencapai sasaran kajian. Tafsirkan **LIMA (5)** perkara diambilkira untuk merekabentuk borang soal-selidik yang baik.*

[10 marks]
[*10 markah*]

QUESTION 2
SOALAN 2

CLO2 C3

a) i) A sample of 10 students in polytechnic showed the following credit hours taken during the first year of their programme. Calculate the mean, median and mode.

18 20 21 24 17 18 21 18 22 19

Berikut adalah sampel bagi 10 orang pelajar politeknik yang menunjukkan jam kredit semasa tahun pertama dalam programnya. Hitungkan min, median dan mod sampel tersebut.

18 20 21 24 17 18 21 18 22 19

[5 marks]
[*5 markah*]

ii) The **Table B2(a)** shows the years of working experience for 60 employees of Aliff's Company. Calculate the mean and the median for group data of employee's years of working experience.
Jadual B2(a) *menunjukkan pengalaman bekerja bagi 60 kakitangan Syarikat Aliff. Kirakan min dan median data terkumpul bagi pengalaman bekerja tahunan kakitangan itu.*

Table B2(a) / ***Jadual B2(a)***

Years of experience ***(Data interval)***	**Number of employees (*fi*)** ***(Jumlah pekerja)***
1 - 4	8
5 - 8	10
9 - 12	14
13 - 16	12
17 - 20	8
21 - 24	5
25 - 28	3

[10 marks]
[*10 markah*]

CLO2
C4

b) The age distribution of insurance agents in an insurance company is shown in **Table B2(b).**

*Taburan umur bagi agen insurans dalam sebuah syarikat insurans adalah seperti yang ditunjukkan dalam **Jadual B2(b).***

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

Age (year) *(Umur)*	**No. of agents** *(Jumlah agen)*
21 - 25	10
26 - 30	35
31 - 35	16
36 - 40	14
41 - 45	12
46 - 50	10
51 - 55	3

i) Calculate the mean age of the insurance agents.

Kirakan min umur bagi agen insurans.

ii) Draw a histogram for the above data.

Lukis histogram bagi data di atas.

iii) From the histogram, determine the mode value and explain its meaning.

Daripada histogram tersebut, tentukan nilai mod dan jelaskan maksudnya.

[10 marks]
[*10 markah*]

QUESTION 3

SOALAN 3

CLO2
C3

a) Three hundred adults over 50 years of age were classified according to their smoking habits and their history of heart attacks. The results are shown in **Table B3(a).**

*Tiga ratus orang dewasa yang berumur di atas 50 tahun dikelaskan mengikut tabiat merokok dan sejarah serangan jantung mereka. Hasilnya ditunjukkan dalam **Jadual B3(a).***

Table B3(a)/ *Jadual B3(a)*

Smoking habits/ *Tabiat merokok*	Heart attack/ *Serangan jantung*		Total/ *Jumlah*
	Yes/ *Ya*	No/ *Tidak*	
Non-smoker/ *Bukan perokok*	15	100	115
Moderate smoker/ *Perokok sederhana*	43	50	93
Heavy smoker/ *Perokok tegar*	76	16	92
Total/ *Jumlah*	134	166	300

Calculate the probability that a selected person;

Kirakan kebarangkalian seseorang yang dipilih;

i) has a heart attack.
mempunyai serangan jantung.

ii) is a non-smoker or has no heart attacks.
adalah bukan perokok atau tidak ada serangan jantung.

iii) has a heart attack given that the person is a moderate smoker.
mempunyai serangan jantung memandangkan beliau adalah perokok yang sederhana.

[15 marks]
[*15 markah*]

CLO2
C4

(b) In a survey carried out in a school snack shop, 78 students like sweets, 74 like ice cream, and 53 like cakes. If a student is selected at random, identify in details the probability that he likes:

Dalam kaji selidik yang dijalankan di kedai makanan ringan sekolah, 78 pelajar menyukai gula-gula, 74 menyukai ais krim, dan 53 menyukai kek. Sekiranya pelajar dipilih secara rawak, kenalpasti kebarangkalian bahawa dia menyukai:

i) Cakes
Kek

ii) Sweets or ice cream
Gula-gula atau ais krim

iii) Sweets or cakes or ice cream
Gula-gula atau kek atau ais krim

iv) Snack which are not cakes
Makanan ringan yang bukan kek

[10 marks]
[10 *markah*]

QUESTION 4

SOALAN 4

CLO2
C3

(a) A real estate agent believes that the monthly rent of houses depend on the size of the house. A sample of eight houses in a residential area was selected and the information gathered in **Table B4(a).**

Seorang ejen hartanah percaya bahawa sewa bulanan rumah bergantung kepada saiz rumah. Sampel kajian terdiri daripada lapan buah rumah di kawasan perumahan telah dipilih dan maklumat dikumpulkan dalam ***Jadual B4(a).***

Table B4(a) / *Jadual B4(a)*

Monthly rent, y (RM) x 10^2/ ***Sewa bulanan, y (RM) x 10^2***	**Size, x (x 10^2 square feet)/** ***Saiz, x (x 10^2 kaki persegi)***
12	10
16	14
9	8
15	12
9	7
17	14
9	7
16	11

i. Calculate the equation of the regression line.
Kirakan persamaan bagi garis regresi.

ii. Calculate the monthly rent y, when the size $x = 1150$ square feet.
Kirakan sewa bulanan, y apabila saiz x= 1150 kaki persegi.

[15 marks]
[*15 markah*]

CLO2
C4

(b) A professor at a university collected the following data on English test scores and Mathematics test scores for ten students. **Table B4(b)** gives their scores. Compute and interpret Pearson's correlation coefficient.

Seorang profesor di universiti mengumpul data berikut mengenai skor ujian Bahasa Inggeris dan skor ujian Matematik untuk sepuluh pelajar. ***Jadual B4(b)*** *memberikan markah mereka. Kira dan tafsirkan pekali korelasi Pearson.*

Table B4(b) / ***Jadual B4(b)***

English / ***Bahasa Inggeris,*** x	**Mathematics /*Matematik,*** y
30	28
50	25
40	25
55	23
30	30
25	32
60	21
25	35
50	26
55	25

[10 marks]
[*10 markah*]

SOALAN TAMAT

FORMULAS –DCC3132 STATISTICS

NUMERICAL DESCRIPTIVE MEASURES

Mean for individual data, $\bar{x} = \frac{\Sigma x}{n}$

Mean for group data, $\bar{x} = \frac{\Sigma fx}{n}$

Median position = $\left(\frac{n+1}{2}\right)$

Location of median class in group data = $\left(\frac{\Sigma f}{2}\right)$

Median $= L_m + \left[\frac{\frac{n}{2} - \Sigma f_{m-1}}{f_m}\right] \times C$

Mode $= L_m + \left[\frac{f_0 - f_1}{(f_0 - f_1) + (f_0 - f_2)}\right] \times C$

PROBABILITY

Additional rule 1 (mutually exclusive events :

P (A or B) = P (A) + P (B)

Additional rule 2 (events not mutually exclusive) :

P(A or B) = P(A) + P(B) – P (A and B)

Multiplication rule 1 (independent events):

P(A and B) = P(A)•P(B)

Multiplication rule 2 (dependent events):

P(A and B) = P(A)•P(B/A)

Conditional probability:

$$P(B/A) = \frac{P\ (A\ and\ B)}{P\ (A)}$$

Comple mentary events :

$$P(\bar{E}) = 1 - P(E)$$

Permutation rule : Number of permutations of n objects taking r at a time is

$$nP_r = \frac{n!}{(n-r)!}$$

Combination rule : Number of combination of r objects selected from n objects is

$$nC_r = \frac{n!}{(n-r)!\,r\,!}$$

CORRELATION AND REGRESSION

Correlation coefficient, r:

(Pearson's correlation coefficient)

$$r = \frac{n\Sigma xy - \Sigma x \Sigma y}{\sqrt{[n(\Sigma x^2) - (\Sigma x)^2][n(\Sigma y^2) - (\Sigma y)^2]}}$$

Correlation coefficient, r:

(Spearman's rank correlation coefficient)

$$\rho = 1 - \frac{6\Sigma d_i^{\ 2}}{n(n^2 - 1)}$$

The regression line equation : $y = a + bx$

where :

$$a = \frac{(\Sigma y)(\Sigma x^2) - (\Sigma x)(\Sigma xy)}{n(\Sigma x^2) - (\Sigma x)^2}$$

$$b = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{n(\Sigma x^2) - (\Sigma x)^2}$$