POLITEKNIK
MALAYSIA

BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK
KEMENTERIAN PENDIDIKAN TINGGI

JABATAN KEJURUTERAAN AWAM

PEPERIKSAAN AKHIR

SESI DISEMBER 2017

DCC3132: STATISTICS

TARIKH : 08 APRIL 2018
MASA : 8.30 PAGI – 10.30 PAGI (2 JAM)

Kertas ini mengandungi **TIGA BELAS (13)** halaman bercetak.

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

Dokumen sokongan yang disertakan : 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 berstruktur. Jawab SEMUA soalan.

QUESTION 1
SOALAN 1

CLO1
C1

(a) Define **TWO (2)** types of statistics.

Takrifkan DUA (2) jenis statistik.

   i)   Descriptive statistics.
       Statistik diskriptif

   ii)   Inferential statistics.
       Statistik inferensi.

[5 marks]
[*5 markah*]

CLO1
C2

(b) Explain briefly the following statistical terms :
Terangkan secara ringkas terma-terma statistik berikut :

   i)   Population
       Populasi

   ii)   Sample
       Sampel

   iii)   Census
       Banci

iv) Pilot Study

  Kajian Rintis

[10 marks]
[*10 markah*]

CLO1
C3

(c) Employees are required to analyse their satisfaction level of with the welfare services provided by the organization. List the statistical problem solving steps to analyse the statement above.

  Pekerja dikehendaki untuk menganalisa tahap kepuasan terhadap perkhidmatan kebajikan yang disediakan oleh organisasi. Senaraikan langkah-langkah penyelesaian masalah statistik untuk menganalisa kenyataan di atas.

[10 marks]
[*10 markah*]

QUESTION 2

SOALAN 2

CLO2
C1

(a) State **TWO (2)** importances of data presentation.

  *Nyatakan **DUA (2)** kepentingan persembahan data.*

[5 marks]
[*5 markah*]

CLO2
C2

(b) Differentiate between Bar Chart and Histogram.

  Berikan perbezaan antara Carta Bar dan Histogram.

[10 marks]
[*10 markah*]

CLO2
C3

(c) The following data represents the number of cars sold over a period of 17 days in the month of January.

Data berikut mewakili bilangan kereta yang dijual dalam tempoh 17 hari pada bulan Januari.

Table A2(c)/ Jadual A2(c)

Day/ *Hari*	Number of cars/ *Bilangan kereta*
1	80
2	60
3	70
4	71
5	69
6	89
7	66
8	100
9	50
10	88
11	85
12	125
13	107
14	112
15	96
16	72
17	134

i) Draw the stem-and-leaf plots for the above data.

Lukis "stem-and-leaf plots" bagi data di atas.

[5 marks]
[*5 markah*]

ii) Draw the frequency table for the above data.

Lukis jadual kekerapan bagi data di atas.

[5 marks]
[*5 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) The sampling technique is used to collect data in statistics.

Teknik persampelan digunakan untuk mengumpul data dalam statistik.

    i) Define sampling

    Definisikan maksud persampelan

[2 marks]
[*2 markah*]

    ii) List **THREE (3)** types of non probability sampling technique.

    *Senaraikan **TIGA (3)** jenis teknik persampelan tanpa kebarangkalian.*

[3 marks]
[*3 markah*]

CLO1
C3

(b) Probability sampling techniques are used when researcher plans to make inferences about the population. The sample is selected based on known probabilities.

Teknik pensampelan kebarangkalian digunakan apabila penyelidik bercadang untuk membuat kesimpulan tentang populasi. Sampel dipilih berdasarkan kebarangkalian yang diketahui.

    i) Interpret simple random sampling technique

    Tafsirkan teknik persampelan rawak mudah.

[4 marks]
[*4 markah*]

ii) List **TWO (2)** advantages and **ONE (1)** disadvantage of simple random sampling.

Senaraikan DUA (2) kebaikan dan SATU (1) keburukan bagi teknik persampelan rawak mudah.

[6 marks]
[*6 markah*]

CLO1
C4

(c) Identify the suitable data collection method for each of the following situations:

Kenalpasti teknik pengumpulan data yang sesuai digunakan di dalam situasi yang berikut:

i) To determine the level of customer's satisfaction towards the services provided in private hospitals.

Untuk menentukan tahap kepuasan hati pelanggan terhadap perkhidmatan yang disediakan di hospital swasta.

ii) To obtain the opinions of the public on the opening of a new shopping complex.

Untuk mendapatkan pendapat orang ramai mengenai pembukaan kompleks membeli belah yang baru.

iii) To collect current information on former PSA students.

Untuk mengumpulkan maklumat mengenai bekas pelajar PSA.

iv) To determine the acceptance level of newly introduced JASMIN's spice.

Untuk menentukan tahap penerimaan produk rempah JASMIN yang baharu.

[10 marks]
[*10 markah*]

QUESTION 2

SOALAN 2

CLO2
C3

(a) **Table B2(a)** shows the tabulated score of 40 students in a statistics class consisting of 60 items.

Jadual B2(a) menunjukkan taburan markah bagi 40 orang pelajar untuk kelas statistik yang mengandungi 60 item.

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

Score/ *Markah*	Frequency/ *Kekerapan*
10 – 14	5
15 – 19	2
20 – 24	3
25 – 29	5
30 – 34	2
35 – 39	9
40 – 44	6
45 – 49	3
50 - 54	5

By using the formula, calculate the value of:

Dengan menggunakan formula, kira nilai:

i) Mean

Min

ii) Median

Median

iii) Mode

Mod

[15 marks]

[15 *markah*]

CLO2
C4

(b) **Table B2(b)** shows the weight of 160 students from a private institution in Kuala Lumpur.

Jadual B2(b) menunjukkan berat bagi 160 orang pelajar di pusat pengajian swasta di Kuala Lumpur.

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

Kilogram (kg)	Frequency
35 – 39	5
40 – 44	25
45 – 49	35
50 – 54	44
55 – 59	18
60 – 64	22
65 - 69	11

i) Draw a distribution table that consists of cumulative frequency and class boundary.

Lukiskan jadual taburan agihan yang mengandungi kekerapan kumulatif dan sempadan kelas.

ii) Calculate median for the data.

Kirakan median bagi data berikut.

[10 marks]
[10 *markah*]

QUESTION 3

SOALAN 3

CLO2
C3

(a) At the private school, the teachers were surveyed and classified according to their major skills. The data is shown in Table **B3(a)**.

Di sebuah sekolah swasta, para guru telah dikaji dan dikelaskan mengikut kemahiran utama mereka. Data ditunjukkan di dalam Jadual B3(a).

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

Major Skills/ *Kemahiran Utama*	Males/Lelaki	Females/Perempuan
Mathematics/ *Matematik*	8	5
Science/ *Sains*	6	7
English/ *Bahasa Inggeris*	4	8
History/ *Sejarah*	3	5

If a teacher is selected randomly, calculate these probabilities,

Sekiranya seorang guru dipilih secara rawak, kirakan kebarangkalian ini,

i) Mathematics Teacher Or Female

Guru Matematik atau Perempuan

ii) History Teacher Or Male

Guru Sejarah atau Lelaki

iii) Not an English Teacher

Bukan Guru Bahasa Inggeris

iv) Male Science Teacher

Guru Sains Lelaki

v) Mathematics Or Science Teacher

Guru Matematik atau Guru Sains

[15 marks]
[*15 markah*]

CLO2
C4

(b) At a bakery shop, 12 customers bought a vanilla cupcake, 10 chocolate cupcake, 8 red velvet cupcakes and 7 orange cupcakes. If a customer is selected at random, identify the probability that she is going to purchase:

Di kedai kek, 12 orang membeli kek cawan vanilla, 10 kek cawan cokelat, 8 kek cawan red velvet dan 7 kek cawan oren. Jika pelanggan dipilih secara rawak, kenalpasti kebarangkalian bahawa dia membeli :

i) A red velvet cupcake

   Kek cawan red velvet

ii) Vanilla or chocolate cupcake

   Kek cawan vanila atau coklat

iii) Vanilla or orange or chocolate cupcake

   Kek cawan vanila atau oren atau coklat

iv) A cupcake that is not orange flavour

   Kek cawan yang bukan oren

[10 marks]
[*10 markah*]

QUESTION 4
SOALAN 4

CLO2
C3

(a) **Table B4(a)** below shows the interest rates for car loans and the average number of customers who applied for loans in a month from a finance company.

Jadual B4(a) di bawah menunjukkan kadar faedah bagi pinjaman kereta dan purata bagi bilangan pelanggan yang memohon pinjaman dalam masa sebulan di sebuah syarikat kewangan.

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

Interest Rate In %, X/ *Kadar Faedah %, X*	Number Of Applicants, Y/ *Bilangan Pemohon, Y*
6.0	80
6.2	80
6.5	78
6.8	75
7.0	70
7.2	60
7.5	60
7.8	55
8.0	50
8.2	48
8.4	45
8.7	40

i) Calculate the value of correlation using Pearson's Correlation Coefficient.

Kirakan nilai pekali korelasi mengunakan Pearson's Correlation Coefficient.

[13 marks]
[13 *markah*]

ii) Relate the interest rate with the number of applicants.

Hubungkaitkan di antara kadar faedah dan bilangan pemohon pinjaman.

[2 marks]
[2 *markah*]

CLO2
C4

(b) Five students A, B, C, D and E are ranked based on their results for two subjects; Statistics and Science as shown in **Table B4(b)**. Determine the correlation coefficient by using Spearman's Rank Correlation Coefficient.

*Lima orang pelajar A, B, C, D dan E telah disusun berdasarkan markah bagi 2 subjek iaitu Statistik dan Sains seperti ditunjukkan dalam **Jadual B4(b)**. Tentukan nilai pekali kolerasi menggunakan Spearmans's Rank Correlation Coeffiecient.*

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

Subject	A	B	C	D	E
Statistics	1	2	3	4	5
Science	3	1	4	2	5

[10 marks]
[10 *markah*]

SOALAN TAMAT

FORMULA

NUMERICAL DESCRIPTIVE MEASURES

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

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

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

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

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

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:

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

Complementary 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)

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

Correlation coefficient, r:

(Spearman's rank correlation coefficient)

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

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

where :

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

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