

**SULIT**



**BAHAGIAN PEPERIKSAAN DAN PENILAIAN  
JABATAN PENDIDIKAN POLITEKNIK  
KEMENTERIAN PENDIDIKAN TINGGI**

**JABATAN KEJURUTERAAN AWAM**

**PEPERIKSAAN AKHIR**

**SESI JUN 2015**

**DCW3162 : INDUSTRIAL STATISTICS**

**TARIKH : 21 OKTOBER 2015**

**MASA : 8.30 AM – 10.30 AM (2 JAM)**

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Kertas ini mengandungi **DUA BELAS (12)** halaman bercetak.  
Bahagian A: Struktur (2 soalan)  
Bahagian B: Struktur (4 soalan)  
Dokumen sokongan yang disertakan : Kertas Graf dan Formula

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**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN**

**(CLO yang tertera hanya sebagai rujukan)**

**SULIT**

## 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

CLO1  
C1

a) Define each of the following terms:

*Berikan definisi bagi perkara-perkara berikut:*

i. Descriptive statistics / *Statistik diskriptif*ii. Inferential statistics / *Statistik Inferen*iii. Variable / *Pembolehubah*iv. Population / *Populasi*v. Sample / *Sampel*

[10 marks]

[10 markah]

CLO1  
C2

b) Identify five techniques of non-probability sampling.

*Kenal pasti lima teknik bukan kebarangkalian persampelan.*

[5 marks]

[5 markah]

- CLO1  
C3 c) The data below are the marks obtained by 30 students in Industrial Statistics Test in 2014.

95	70	83	80	93	65	44	38	64	50
80	86	71	78	81	53	68	18	54	69
73	79	62	61	79	67	33	27	52	48

Draw a stem and leaf plot for the above data.

*Lukiskan plot batang dan daun bagi data diatas.*

[10 marks]

[10 markah]

### QUESTION 2

#### SOALAN 2

- CLO1  
C2 a) The data below shows the marks scored by ten students in an according test.  
*Data di bawah menunjukkan markah yang diperolehi oleh sepuluh orang pelajar dalam satu ujian.*

65, 85, 80, 80 75, 90 60, 55, 76, 80

Calculate / Kirakan

- Mean / Purata
- Mode / Mod

[5 marks]

[5markah]

- CLO1  
C3 b) Calculate the variance and standard deviation of the following sample.  
*Kirakan varians dan sisihan piawai sampel berikut.*

x	10-14	14-18	18-22	22-26	26-30	30-34
f	8	10	15	12	6	2

[15 marks]

[15 markah]

- CLO1  
C1 c) When a dice is tossed, a sample is obtained. State the elements of the sample space that meets the following requirements.

*Apabila sebiji dadu di lambungkan, ruang sampel yang diperolehi adalah seperti di bawah. Nyatakan unsur-unsur ruang sampel yang memenuhi syarat-syarat berikut.*

{1, 2, 3, 4, 5, 6}

- Even numbers obtained  
*Nombor genap yang diperolehi*
- Prime numbers available  
*Nombor perdana yang diperolehi.*

[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.

## ARAHAN:

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

## QUESTION 1

## SOALAN 1

CLO1  
C2

a) Identify the following statement either categorical data or numerical data:

*Nyatakan kenyataan berikut sama ada data kategori atau berangka :*

- i. Types of mobile phone used by students in a polytechnic  
*Jenis telefon bimbit yang digunakan oleh pelajar dalam Politeknik.*
- ii. Tallying the number of cars in a parking site  
*Mengira bilangan kereta di tempat letak kereta.*
- iii. Measuring in litres the water consumption of a housing area.  
*Mengukur penggunaan air dalam liter bagi kawasan perumahan.*
- iv. T-shirts classified into large, medium and small.  
*Pengelasan t-shirt sama ada besar, sederhana dan kecil.*
- v. Tallying the number of black cars and white cars which pass through a toll booth.  
*Mengira bilangan kereta hitam dan kereta putih yang melalui plaza tol.*

[5 marks]

[5 markah]

CLO1  
C2

b) Based on the following statements, determine whether the data obtained is discrete or continuous data.

*Berdasarkan pernyataan berikut, tentukan sama ada data yang diperolehi adalah diskrit atau data selanjar.*

- i. The number of supermarkets in town.  
*Bilangan pasaraya di bandar.*
- ii. The number of calls within 30 minutes.  
*Bilangan panggilan dalam tempoh 30 minit.*
- iii. The time taken to cook rice.  
*Masa yang diambil untuk memasak nasi.*
- iv. The speed of cars on a particular road.  
*Kelajuan kereta di jalan raya tertentu.*
- v. The number of car accidents in a particular month over a few years.  
*Bilangan kemalangan kereta pada bulan tertentu sejak beberapa tahun.*

[5 marks]

[5 markah]

CLO1  
C1

c) Define the following terms:

*Berikan definisi bagi perkara-perkara berikut:*

- i. Sampling / *Persampelan*
- ii. Telephone interview / *Temuduga telefon*
- iii. Probability sampling techniques / *Teknik persampelan kebarangkalian*

[5 marks]

[5 markah]

CLO1  
C3

- d) A researcher intends to determine the monthly expenses of the students in Polytechnic Shah Alam. The breakdown of the students according to their ethnicity is shown in below **TABLE Q1**. The researcher plans to randomly select 20% of the students from each ethnic group.

*Seorang penyelidik bercadang untuk menentukan belanjawan bulanan pelajar di Politeknik Shah Alam. Analisis seisi rumah ini mengikut kaum seperti **JADUAL Q1**. Penyelidik memilih secara rawak 20% daripada pelajar bagi setiap kaum.*

Ethnic Group	Number of students
Malay	220
Chinese	200
Indian	160
Others	20

**TABLE Q1**  
**JADUAL Q1**

- i. The researcher uses stratified sampling techniques. Interpret sampling techniques. (in four key point)

*Penyelidik menggunakan teknik persampelan berstrata. Terjemahkan teknik persampelan tersebut. (dalam empat isi)*

[4 marks]

[4 markah]

- ii. Calculate the number of students needed for each group in the study.

*Kira bilangan pelajar yang diperlukan bagi setiap kumpulan dalam kajian ini.*

[6 marks]

[6 markah]

**QUESTION 2****SOALAN 2**CLO 1  
C2

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

*Data di bawah menunjukkan markah skor bagi 10 pelajar dalam Ujian 'Pollution Management'.*

55 75 70 70 65 80 50 45 66 70

Calculate the mean, median and mode.

*Kira min, median dan mod.*

[10 marks]

[10 markah]

CLO1  
C3

- b) The table below shows the frequency distribution for weight of 50 female students in DKA. Measurement has been recorded to the nearest kilogram (kg).

*Jadual dibawah menunjukkan taburan kekerapan untuk berat 50 orang pelajar perempuan DKA. Pengukuran direkodkan kepada kilogram (kg) yang hampir.*

Weight (kg)	Number of female students
40 – 44	3
45 – 49	2
50 – 54	7
55 – 59	14
60 – 64	18
65 – 69	5
70 - 74	1

- i. Draw a "less than" ogive on a graph paper.

*Lukis ogif "kurang daripada" pada kertas graf.*

[11 marks]

[11 markah]

- ii. From the ogive graph, calculate the median.  
*Daripada graf ogif, tentukan median.*

[ 4 marks]

[4 markah]

## QUESTION 3

## SOALAN 3

- a) A Set of data is given as follows. Calculate the mean, mode and median of the data.

*Satu set data adalah seperti berikut. Kirakan min, mod dan median data*

0.34 0.13 1.27 1.54 1.29 2.81 1.73 2.45 0.34

[10 marks]

[10 markah]

- b) The following **TABLE Q3** shows the scores obtained by 60 candidates in a mathematics test. Determine the mean score, variance and standard deviation.

*Berikutan JADUAL Q3 menunjukkan skor yang diperolehi 60 calon dalam ujian matematik. Menentukan skor min, varians dan sisihan piawai.*

Score	Frequency
100 – 106	8
107 – 113	13
114 – 120	24
121 – 107	11
128 – 134	4

TABLE Q3

JADUAL Q3

[15 marks]

[15 markah]

## QUESTION 4

## SOALAN 4

CLO 1  
C1

- a) A bag has 20 cards. The cards are numbered 1 to 20 respectively. If a card is chosen at random, identify the probability of obtaining an odd number.

*Beg A mempunyai 20 kad. Kad tersebut masing-masing bernombor dari 1 hingga 20. Jika kad dipilih secara rawak, kenalpasti kebarangkalian mendapat nombor ganjil.*

[5 marks]

[5 markah]

CLO 1  
C2

- b) A mathematics exam paper consists of 9 questions. Determine the number of combinations to answer 5 questions if a student is required to answer 3 questions from Section A which consists of 5 questions and 2 questions from Section B which consists of 4 questions.

*Kertas peperiksaan matematik ini mengandungi 9 soalan. Tentukan jumlah kombinasi untuk menjawab 5 soalan jika seseorang pelajar dikehendaki menjawab 3 soalan dari Bahagian A yang terdiri daripada 5 soalan dan 2 soalan daripada Bahagian B yang mengandungi 4 soalan.*

[5 marks]

[5 markah]

CLO 1  
C3

- c) A hostel comprises of 30% of first semester students, 20% of second semester students and 50% of third semester, 2%, 4% and 5% of 1st, 2nd and 3rd semester have their own transportation. A student has been chosen randomly.

*Pelajar-pelajar asrama terdiri daripada 30% pelajar semester 1, 20% pelajar semester 2 dan 50% pelajar semester 3, 2%, 4% dan 5% pelajar semester 1, 2 dan 3 mempunyai kenderaan sendiri. Seorang pelajar telah dipilih secara rawak.*

- Draw a tree diagram  
*Lukiskan gambarajah pokok.*
- Calculate the probability of first semester students that do not have their own transportation  
*Kirakan kebarangkalian pelajar semester 1 tidak mempunyai kenderaan sendiri.*
- Calculate the probability that students do not have their own transportation.  
*Kirakan kebarangkalian pelajar tidak mempunyai kenderaan sendiri.*

[15 marks]

[15 markah]

SOALAN TAMAT

## FORMULA

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

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

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

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

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

$$vi. x = L_1 + \left[ \frac{\frac{n}{2} - \sum f_{b_{q-1}}}{f_2} \right] \times c$$

$$vii. D_k = L_m + \left[ \frac{\frac{k}{20} - \sum f_{BD_1}}{f_{D_1}} \right] \times c$$

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

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

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

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

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