UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA
PEPERIKSAAN AKHIR
SEMESTER II
SESI 2013/2014

NAMA KURSUS	: STATISTIK ASAS
KOD KURSUS	: BBR 33803
PROGRAM	: 3BBR
TARIKH PEPERIKSAAN	: JUN 2014
MASA	: 3 JAM
ARAHAN	: JAWAB SEMUA SOALAN

KERTAS SOALAN INI MENGANDUNGI **SEBELAS (11)** MUKA SURAT

S1 (a) Jadual S2 (a) adalah data-data yang diperolehi oleh sekumpulan pelajar semasa menjalankan eksperimen sains di sekolah mereka. Bina jadual kekerapan dengan had kelas 0.5 – 9.5, 9.5 – 19.5, 19.5 – 29.5

Jadual S2 (a): Data eksperimen sains

23.3	12.4	58.1	32.2	14.0	58.2	75.4	23.9
23.9	18.3	22.0	37.1	31.4	8.5	1.0	15.5
6.9	5.2	28.7	26.3	13.9	25.9	26.8	26.9
16.8	37.7	10.6	21.9	31.6	30.1	42.4	16.5
21.2	32.9	8.8	10.6	28.6	40.7	12.9	13.8

(8 markah)

(b) Daripada Jadual kekerapan yang telah dihasilkan, dapatkan
(i) min
(ii) sisihan piawai
(iii)median

(12 markah)

S2   (a) Cari nilai a,b dan c, di mana $X \sim P_0 (2.5)$:

          (i) $P(X \leq a) = 0.8912$

          (ii) $P(X \leq x) = 0.9997$

          (iii) $P(X < b) = 0.5438$

(9 markah)

    (b) Satu unit radar digunakan untuk mengukur kelajuan kereta di lebuh raya. Kelajuan adalah bertaburan normal dengan min 90 km/jam dan sisihan piawai 10 km/jam. Apakah kebarangkalian bahawa sebuah kereta dipilih secara rawak pada perjalanan lebih daripada 100 km/jam?

(5markah)

    (c) Min dan sisihan piawai bagi keputusan ujian pedagogi bagi pelajar seksyen dua adalah 72 dan 10. Sekiranya pelajar dipilih secara rawak daripada kelas tersebut, apakah kebarangkalian terdapat pelajar yang memperolei markah kurang daripada 82?

(6 markah)

S3   (a) X adalah taburan normal dengan nilai $\mu = 30$ dan $\sigma = 4$. Cari

          (i) $P(X < 40)$

          (ii) $P(X > 21)$

          (iii) $P(30 < X < 35)$

(12 markah)

    (b) Ahmad yang bersekolah di Sekolah Tinggi memperolehi keputusan ujian sebanyak 78% di mana purata min dan sisihan piawai adalah bertabur sebanyak 50 dan 10. Manakala Kassim yang bersekolah di Sekolah Tengku Mahmud pula memerolehi 75% di mana min dan sisihan piawai adalah sebanyak 40 dan 8. Siapakah yang memperolehi keputusan paling cemerlang antara Ahmad dan Kassim?

(8 Markah)

S4 (a) Satu kajian terhadap 1500 orang telah dijalankan untuk menentukan umur. Purata bagi umur yang telah diperolehi adalah sebanyak 48 dan sisihan piawai pula adalah sebanyak 17. Tentukan aras keyakinan pada aras .05.

(8 markah)

(b) Kursus motivasi telah diberikan kepada dua kumpulan jurujual dengan tujuan meningkatkan jualan syarikat. Selepas kursus, kumpulan A yang terdiri daripada 50 orang jurujual telah Berjaya meningkatkan min jualan bulanan sebanyak RM250 dengan sisihan piawai RM60. Min jualan bulanan kumpulan B yang terdiri daripada 40 orang jurujual pula telah meningkat sebanyak RM150 dengan sisihan piawai RM30. Antara kedua-dua kumpulan jurujual tersebut, dapatkan selang keyakinan 95% untuk perbezaan dalam pertambahan jualan bulanan.

(5 markah)

(c) Seorang ejen kereta ingin mengkaji kualiti enjin dua jenis kereta berdasarkan kepada kekerapan kerosakkan. Satu sampel rawak 15 orang pemilik kereta telah ditanya berapa kali enjin kereta mereka perlu dibaiki dalam tempoh dua tahun yang lepas. Semua kereta adalah berusia 5 tahun ke atas. Maklumat adalah seperti berikut:

Kereta jenis A, Min= 8 , Sisihan piawai=1.8

Kereta Jenis B, Min= 5, Sisihan piawai= 2.1

Andaikan kedua-dua populasi adalah sama. Dapatkan selang keyakinan 90% untuk perbezaan min bilangan kerosakkan bagi dua jenis kereta tersebut.

(7 Markah)

S5 (a) Nyatakan dua kaedah untuk mengira korelasi.

(4 markah)

(b) Pengurusan sebuah kilang mendapati cuti sakit yang diambil oleh sekumpulan pekerja bertambah apabila mereka bekerja lebih masa. Data cuti sakit sebahagian pekerja yang dipilih secara rawak adalah ditunjukkan dalam JADUAL S6(b).

JADUAL S6(b)

Cuti sakit (hari)	16	22	11	16	7	3	17
Kerja lebih masa (jam)	44	51	49	54	58	62	68

Berdasarkan maklumat dalam jadual **JADUAL S6(b).**

(i) Lakarkan gambarajah serakan

(ii) Kirakan nilai anggaran kecerunan β_1 dan anggaran pintasan β_0

(iii) Dapatkan persamaan garis regresi

(16 Markah)

-SOALAN TAMAT-

S1 (a) Table S2 (a) obtained by a group of students while conducting science experiments in their school. Construct the frequency distribution table with the class width 0.5 – 9.5, 9.5 – 19.5, 19.5 – 29.5 and so on

Table S2 (a): Science experiments data

23.3	12.4	58.1	32.2	14.0	58.2	75.4	23.9
23.9	18.3	22.0	37.1	31.4	8.5	1.0	15.5
6.9	5.2	28.7	26.3	13.9	25.9	26.8	26.9
16.8	37.7	10.6	21.9	31.6	30.1	42.4	16.5
21.1	32.9	8.8	10.6	28.6	40.7	12.9	13.8

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(8 marks)

(b) Based on the frequency table, find
    (i)   mean
    (ii) standard deviation
    (i)   median

(12 marks)

S2 (a) Find the values of a,b,c and given that $X \sim P_0 (2.5)$:

    (i) $P(X \leq a) = 0.8912$

    (ii) $P(X \leq x) = 0.9997$

    (iii) $P(X < b) = 0.5438$

(9 marks)

   (b) A radar unit is used to measure speeds of cars on a motorway. The speeds are normally distributed with a mean 0f 90 km/hr and a standard deviation of 10 km/hr. What is the probabiliry that a car picked at random is travelling at more than 100 km/hr?

(5 marks)

   (c) The mean and standard deviation for the pedagogy test results for section II are 72 and 10 respectively. If a student is randomly chosen from this class, what is the probability of finding a student whose mark is less than 82?

(6 marks)

S3 (a) X is a normally distributed variable with $\mu = 30$ and $\sigma = 4$, find:

    (i) $P(X < 40)$

    (ii) $P(X > 21)$

    (iii) $P(30 << 35)$

(12 marks)

   (b) Ahmad who is in High School scores 78% in statistics where the mean and standard deviation of the score distribution are 50 and 10. Kassim who is in Tengku Mahmud School obtains 75% where the mean and standard deviations are 40 and 8. Whose score is better between Ahmad and Kassim?

(8 marks)

S4 (a) A survey of 1500 people was carried out to determine people's age. The mean age is found to be 48 with a SD of 17. Determine a .05 confidence interval

(8 marks)

(b) A motivation course has been given to two group salesman in order to increase company's sales. After that courses, A group that consisting of 50 salesmen had improved mean their monthly sale total up to RM250 with standard deviation RM60. Mean monthly for sale group B that consisting of 40 salesmen has increased total up to RM150 with standard deviation RM30. Get the confidence interval 95% for difference expansion monthly sale between that two group salesmen

(5 marks)

(c) An agent car want to study about the engine quality of two type car based on frequency damage. A random sample 15 car owner has been asked about how many times their car engine need to repair by period of last two years. All of the cars that studied are 5 years old. The Information are as follows:
Car type A : Mean = 8, standard deviation = 1.8
Car type B : Mean = 5, standard deviation = 2.1
Assume that both population variance are same.
Get the confidence interval 90% difference mean number for two type of car

(7 marks)

S5   (a) State two methods to calculate the correlation.

(4 marks)

(b) Management of a factory found medical leave taken by a some of employees had grown when they increased overtime. Data of medical leave randomly selected employees are shown in table S6 (b)

TABLE S6(b)

Medical leave (days)	16	22	11	16	7	3	17
Overtime (hours)	44	51	49	54	58	62	68

Based on the information in the tables table s6 (b).

(i) Draw a scatter diagram.

(ii) Calculate the estimate slope β_1 and intercept β_0.

(iii) Determine the equation of the regression line.

(16 marks)

-END OF QUESTIONS-

FINAL EXAMINATION

SEMESTER/SESSION: SEM II/2013/2014   PROGRAMME: 3 BBR

COURSE: BASIC STATISTICS   COURSE CODE: BBR 33803

Descriptive statistic

Class interval = $\underline{\text{highest value } – \text{lowest value}}$ where $k = 1 + 3.3 \log n$

$$K$$

$$= \frac{\sum_{i=1}^{n} f_i x_i}{\sum_{i=1}^{n} f_i} \; . \qquad M = L_M + C\left(\frac{n/2 - F}{f_m}\right) \qquad M_o = L + C\left(\frac{d_1}{d_1 + d_2}\right) \qquad s^2 = \frac{1}{\Sigma f - 1}\left[\sum_{i=1}^{n} f_i x_i^2 - \frac{(\Sigma f_i x_i)^2}{\Sigma f}\right] .$$

Special Probability Distributions: Binomial Distributions

$$P(X=r) = {}^nC_r \, p^r \, q^{n-r} \,, q = (1-P), \, r = 0,1, \ldots \ldots , \quad X \sim B\,(n,p)$$

Special probability distributions: poisson Distributions

$$P(X=r) = \frac{e^{-\square} \square^r}{r!} \qquad\qquad r = 0,1,\ldots \infty, \quad X \sim PO\,(\,\square\,)$$

Normal Distribution

$$X \sim N(\square, \sigma^2), \; Z \sim N(0,1) \text{ and} \qquad Z = \frac{X - \mu}{\sigma}$$

Sampling distributions

$$\overline{X} \sim N\,(\,\square, \sigma 2/n), \quad Z = \frac{\overline{X} - \mu}{\frac{\sigma}{\sqrt{n}}} \qquad\qquad \sim N(0,1)$$

Estimation

$$\overline{x} \pm Z_{\alpha/2}\frac{SD}{\sqrt{n}} < \square < \overline{x} \pm Z_{\alpha/2}\frac{SD}{\sqrt{n}}$$

$$\overline{x} - t_{\alpha/2}\frac{SD}{\sqrt{n}} < \square < \overline{x} + t_{\alpha/2}\frac{SD}{\sqrt{n}}$$

Regrasi

$$y = ß_0 + ß_1 x, \quad \overline{X} = \frac{\Sigma X}{n}$$