

UNIVERSITI SAINS MALAYSIA

First Semester Examination
Academic Session 2004/2005

October 2004

**IUK 106E – Statistics For Technologist
/Statistik Untuk Teknologis/**

Duration : 3 hours
[Masa : 3 jam]

Please check that the examination paper consists of FIVE pages of printed material before you begin the examination.

[Sila pastikan bahawa kertas peperiksaan in mengandungi LIMA muka surat yang bercetak sebelum anda memulakan peperiksaan ini.]

Instructions: Answer **FIVE** questions. Students are allowed to answer all questions in English OR Bahasa Malaysia OR combination of both.

*[**Arahan:** Jawab **LIMA** soalan. Semua soalan boleh dijawab dalam Bahasa Inggeris ATAU Bahasa Malaysia ATAU kedua-duanya.]*

...2/-

1. For the following frequency distribution Table :

Classes	Frequency (f)	$f.x^2$
0-99	11	26952.75
100-199	-	268203
200-299	14	871503.5
300-399	-	122150.25
400-499	2	404100.5

$$\sum f.x^2 = 1692910$$

Find:

- (a) The mean
- (b) The standard deviation

(20 marks)

1. Bagi jadual kekerapan berikut :

Kelas	Kekerapan (f)	$f.x^2$
0-99	11	26952.75
100-199	-	268203
200-299	14	871503.5
300-399	-	122150.25
400-499	2	404100.5

$$\sum f.x^2 = 1692910$$

Cari:

- (a) Min
- (b) Sisihan piawai

(20 markah)

...3/-

2. A sample of items is randomly selected without replacement and the entire batch is accepted if every item in the sample is okay. The Niko Electronics Company has just manufactured 300 CDs, and 0.03 are defective. If 12 of these CDs are randomly selected for testing, what is the probability that the entire batch will be accepted?

(20 marks)

2. *Satu sampel barang dipilih secara rawak tanpa penggantian dan keseluruhan kelompok diterima jika setiap barang berkeadaan baik. Syarikat Elektronik Niko telah menghasilkan 300 cakera padat, dan 0.03 adalah defektif. Jika 12 dari cakera padat ini dipilih secara rawak untuk ujian, apakah kebarangkalian keseluruhan kelompok akan diterima?*

(20 markah)

3. In order to monitor the ecological health of the Florida Everglades, various measurements are recorded at different times. The bottom temperatures are recorded at the Garfield Bight station and the mean of 30.4°C is obtained for 61 temperatures recorded on 61 different days. Assuming that $\sigma = 1.7^{\circ}\text{C}$, find a 95% confidence interval estimate of the population mean of all such temperatures.

(20 marks)

3. *Untuk memonitor keadaan ekologi paya Florida, pelbagai ukuran direkodkan pada waktu-waktu yang berbeza. Suhu bawah direkodkan pada stesyen Bight Garfield dan min 30.4°C telah diperolehi bagi 61 suhu yang direkodkan pada 61 hari berlainan. Dengan menganggap $\sigma = 1.7^{\circ}\text{C}$, cari estimat selang jarak sela keyakinan 95% bagi min semua suhu.*

(20 markah)

4. One survey showed that among 785 randomly selected subjects who completed four years of college, 144 smoke and 641 do not smoke. Use a 0.01 significance level to test the claim that the rate of smoking among those with four years of college is less than the 27% rate for the general population.

(20 marks)

...4/-

4. *Satu tinjauan ke atas 785 subjek rawak yang telah menamatkan empat tahun di kolej, menunjukkan 144 merokok sementara 641 tidak merokok. Gunakan 0.01 paras signifikan untuk menguji dakwaan bahawa kadar merokok bagi subjek yang menghabiskan empat tahun di kolej adalah lebih rendah dari 27% kadar bagi populasi umum.*

(20 markah)

5. For the following data:

X	Y
6	82
2	86
15	43
9	74
12	58
5	90
8	78

- (a) Construct a scatter plot.
(b) Find the equation of the regression.

(20 marks)

5. *Untuk data berikut:*

X	Y
6	82
2	86
15	43
9	74
12	58
5	90
8	78

- (a) *Bina satu plot scatter.*
(b) *Cari persamaan regresi.*

(20 markah)

...5/-

POSITIVE z Scores

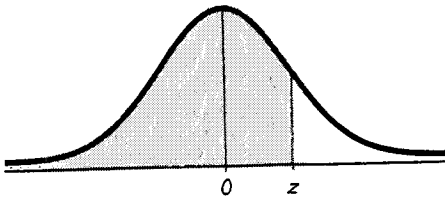


TABLE A-2 (continued) Cumulative Area from the LEFT

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	*.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	*.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998
3.50 and up	.9999									

NOTE: For values of z above 3.49, use 0.9999 for the area.
 *Use these common values that result from interpolation:

z score	Area
1.645	0.9500 ←
2.575	0.9950 ←

Common Critical Values

Confidence Level	Critical Value
0.90	1.645
0.95	1.96
0.99	2.575