CONFIDENTIAL

Infrastructure University Kuala Lumpur

FINAL EXAMINATION
JUNE SEMESTER 2015

BACHELOR OF ACCOUNTANCY (HONS)
BACHELOR OF BUSINESS ADMINISTRATION (HONS)
BACHELOR OF BUSINESS ADMINISTRATION (HONS) IN E-COMMERCE
BACHELOR OF SCIENCE (HONS) IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT
BACHELOR OF ARTS (HONS) IN TEACHING ENGLISH TO SPEAKERS OF OTHER LANGUAGES
BACHELOR OF COMPUTER SCIENCE (HONS)
BACHELOR OF INFORMATION SYSTEMS (HONS)
BACHELOR OF INFORMATION TECHNOLOGY (HONS) IN NETWORK TECHNOLOGY
BACHELOR INFORMATION TECHNOLOGY (HONS) IN SOFTWARE ENGINEERING

INTRODUCTION TO STATISTICS
(BMS 101)

(TIME : 3 HOURS)

MATRIC NO. : | | | | | | | | | |

IC. / PASSPORT NO. : | | | | | | | | | | | | | | |

LECTURER : **NORA'ASIKIN BINTI ABU BAKAR**

GENERAL INSTRUCTIONS

1. This question booklet consists of 7 printed pages including this page.
2. Answer **ALL** questions for Section A in the **Answer Booklet.**
3. Use **Graph Paper** for **Question 4.**
4. Answer only **ONE (1)** question for Section B in the **Answer Booklet.**

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INSTRUCTIONS: **TIME:** ***3 HOURS***

SECTION A **(75 marks)**

Answer ALL SEVEN (7) questions from this section in the Answer Booklet.

1. Classify the following variables as nominal or ordinal.
   a) Quality of book published by university. (1 mark)
   b) Category of houses. (1 mark)
   c) Level of English competency. (1 mark)
   d) The academic qualification required. (1 mark)

2. Calculate mean, mode, median, standard deviation and coefficient of variation from the following data: 2, 1, 6, 3, 10, 4, 3, 3 (11 marks)

3. Table 1 shows the body mass (kg) of 40 children in a kindergarten.

Table 1

Body Mass	10 – 12	13 – 15	16 – 18	19 – 21
No. of children	5	x	16	y

   a) Find x if the degree of a pie chart for second class is 108^0. (2 marks)
   b) Obtain y and the relative frequency of the fourth class. (2 marks)
   c) Draw a pie chart to represent the data in Table 1. (4 marks)

4. Draw a "less than or equal" ogive and estimate the inter-quartile range for the data given in Table 2. **Use Graph Paper.** (12 marks)

Table 2

Class interval	18 – 30	31 – 43	44 – 56	57 – 69
Frequency	12	19	14	5

5. The probability function of a discrete random variable X is given by:

$$p(x) = kx(x-1), \qquad x = 1, 2, 3, 4$$

   a) Obtain the value of k. (4 marks)
   b) Construct the probability distribution table of x (6 marks)
   c) Hence, calculate $E(X), E(X^2)$ and $V(X)$, (2 marks)

6 Let $X \sim N(25, 16)$. Write down μ and σ . Hence, find (2 marks)

a) $P(X \geq 30)$ (4 marks)

b) $P(18 \leq X \leq 34)$ (6 marks)

c) $P(25 \leq X \leq 34)$ (6 marks)

7. a) It is known from the past experience that in a certain plant there are on the average of 4 industrial accidents per month. Find the probability that in a given year will be less that 3 accidents. (5 marks)

b) A taxi firm has two cars which it hires out day by day. The number of demands for a car on each day is distributed with mean 1.5. Calculate the probability of days on which neither car is used and the probability of days on which some demands is refused. (5 marks)

SECTION B **(25 marks)**

Answer ONLY ONE (1) question from this section in the Answer Booklet. Leave all your answers in Section B to 4 decimal places.

1. a) The table below shows weekly earnings (in RM) of full-time male and female workers for five years.

Male workers (x)	670	679	695	713	722
Female workers (y)	512	529	552	573	585

i. Show that correlation coefficient for weekly earnings is 0.9970. Interpret your answer. (8 marks)

ii. Calculate coefficient of determination. Interpret your answer. (3 marks)

iii. Find the equation of the regression line for weekly earnings. (3 marks)

iv. Predict weekly earnings of female workers when weekly earnings of male workers is RM685 and RM310. If the x-value is not meaningful to predict the value of y, explain your reason. (3 marks)

b) A company has appointed 200 dealers to sell its products. The company claimed that the true mean sales per dealer is more than RM60000. To test this claim, a survey based on a random sample of 50 dealers was conducted. From this survey, the sample mean sales per dealer was found to be RM61000 with a standard deviation of RM3500.

i. Based on the data obtained in the survey, is there evidence to refute the company's claim at 0.05 significance level? (6 marks)

ii. If a test is conducted at 0.01 significance level, is your decision different from i)? Show the procedure you used to arrive at your decision. (2 marks)

2. a) The probability that an evening college student will graduate is 0.5. Determine the probability that out of 7 students none will be graduate. (3 marks)

b) During war 2 ships out of 10 was sunk on an average in making certain voyage. What is the probability that at least 4 out of 5 ships would arrive safely. (5 marks)

c) It has been estimated that 10% of frozen beef contain enough Salmonella bacteria to cause illness if improperly cooked. A consumer purchases 10 boxes of frozen beef. What is the probability that the consumer will have more than 6 boxes of contaminated beef? (6 marks)

d) A manufacturer of television set known that on an average 5% of their product is defective. They sells television sets in consignment of 20 and guarantees that not more than 2 set will be defective. What is the probability that the TV set will fail to meet the guaranteed quality? (6 marks)

e) A factory has seven machines: four of model A, which are in use 80% of the time and three of model B which are in use 60% of the time. If the supervisor walks into the factory at a randomly selected time, what is the probability that two machines of model A and one of model B will be in use? (5 marks)

***** END OF QUESTIONS *****

FORMULAE

$$s = \sqrt{\frac{1}{n-1}\left[\sum x^2 - \frac{(\sum x)^2}{n}\right]} \qquad \bar{x} = \frac{\sum x}{n}$$

$$CV = \frac{s}{\bar{x}} \times 100 \qquad PCS = \frac{3(\bar{x} - \tilde{x})}{s}$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B) \qquad P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$\sigma^2 = E(X^2) - \mu^2 \qquad \mu = \sum x \times p(x)$$

$$P(X) = {}^{n}C_x p^x q^{n-x} \qquad P(X) = e^{-\mu}\left(\frac{\mu^x}{x!}\right)$$

$$Z = \frac{x - \mu}{\sigma}$$

$$\bar{x} \pm z\alpha_{/2}\frac{\sigma}{\sqrt{n}} \qquad \bar{x} \pm t\alpha_{/2}\frac{s}{\sqrt{n}}$$

$$v = n - 1$$

$$Z = \frac{\bar{x} - \mu_{\bar{x}}}{\sigma_{\bar{x}}} \qquad t = \frac{\bar{x} - \mu_{\bar{x}}}{\sigma_{\bar{x}}}$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} \qquad \sigma_{\bar{x}} = \frac{s}{\sqrt{n}}$$

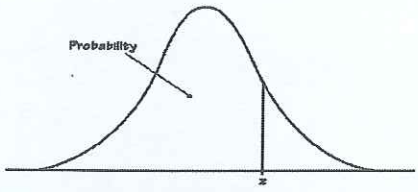
$$S_{xx} = \sum x^2 - \frac{(\sum x)^2}{n} \qquad S_{yy} = \sum y^2 - \frac{(\sum y)^2}{n}$$

$$S_{xy} = \sum xy - \frac{\sum x \sum y}{n} \qquad \hat{\beta}_1 = \frac{S_{xy}}{S_{xx}}$$

$$\hat{\beta}_0 = \bar{y} - \hat{\beta}_1 \bar{x} \qquad \hat{y} = \hat{\beta}_0 + \hat{\beta}_1$$

$$r = \frac{S_{xy}}{\sqrt{S_{xx}S_{yy}}} \qquad r^2 = \frac{{S_{xy}}^2}{S_{xx}S_{yy}}$$

Standard Normal Distribution Table



z	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0	0.5	0.504	0.508	0.512	0.516	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.591	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.648	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.67	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.695	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.719	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.758	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.791	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.834	0.8365	0.8389
1	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.877	0.879	0.881	0.883
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.898	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.937	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.975	0.9756	0.9761	0.9767
2	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.983	0.9834	0.9838	0.9842	0.9846	0.985	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.989
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.992	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.994	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.996	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.997	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.998	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.999	0.999
3.1	0.999	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998