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No of Questions - 09

SCHOOL OF ACCOUNTING AND BUSINESS
BSc. (APPLIED ACCOUNTING) GENERAL / SPECIAL DEGREE
PROGRAMME

YEAR I SEMESTER II (Intake IV – Group B)
END SEMESTER EXAMINATION – APRIL 2016

QMT 10230 Business Statistics

Date : 9th April 2016
Time : 9.00 a.m. - 12.00 p.m.
Duration : Three (03) hours

Instructions to Candidates:

- This paper consist of Three (03) parts. Part I, II and III
Part I - Answer **ALL** questions in the answer sheet provided.
Part II - Answer Any **Five (05)** questions
Part III - Answer **ALL** questions
- Allocated marks for each question is indicated.
- Total marks for the paper is 100.
- Probability sheet will be provided.
- Use of non-programmable electronic calculator is allowed.
- Answers should be written clearly with the required steps.

PART I

Answer **ALL** Questions

Circle the number of the correct answer in the answer sheet provided.

1. A population is divided into number of small groups where it can be identified high heterogeneity between the groups and homogeneity within groups. In order to select a sample in this population the most suitable sampling method would be
- Simple Random Sampling
 - Stratified sampling
 - Cluster sampling
 - Systematic Sampling

Jaseema Products is a leading name in incense sticks market in Sudaroliya. They prepare incense sticks packets with 15 sticks in each. However, they get regular complains that there are less number of sticks in most of the packets. Thus they count the number of sticks in 50 such packets and following information was collected.

Number of Sticks – X	12	13	14	15	16	17	18
Number of Packets - f	3	6	10	12	9	8	2
f*X	36	78	140	180	144	136	36
Cumulative frequency	3	9	19	31	40	48	50

Answer the questions (2) and (3) using above information.

2. Mean number of incense sticks per packet is
- 12
 - 14
 - 15
 - 16

3. Median number of incense sticks per packet is
- i. 12
 - ii. 15
 - iii. 16
 - iv. 18
4. In a group of students 40% are females and out of the females 30% are living in Colombo Suburbs. If 60% of all the students are living in Colombo Suburbs, find the probability that a randomly selected student is a female given that he/she will be living in Colombo Suburbs.
- i. 0.12
 - ii. 0.20
 - iii. 0.72
 - iv. 0.80
5. Forty candidates appeared for an interview was asked about their reading habits on newspapers in order to update their knowledge on current affairs. Fifty percent of the participants said they preferred to read weekend newspapers while 40% said they prefer to read daily newspapers. Twenty percent of the candidates read both weekend and daily newspapers. If a candidate is selected at random find the probability that he/she is not willing to read any of the above two types of newspapers.
- i. 0.10
 - ii. 0.20
 - iii. 0.30
 - iv. 0.40

6. The simple linear regression model for the relationship between monthly sales revenue and the monthly advertising expenditure is given by

$$Y_i = 12.35 + 1.368 X_i$$

Where both variables are measured in terms of Rupees '000. How much it should be invested in advertising to receive a sales value of Rs. 25,000 during next month.

- i. Rs.4625
 - ii. Rs. 5109
 - iii. Rs. 5925
 - iv. Rs. 9247
7. A photocopying machine is set so that the probability of printing a defective copy is 0.01. Mr. Jinadasa is requested to get eight copies of a single page document from this machine. What will be the probability he will not get any defective copies?
- i. 0.0000
 - ii. 0.0746
 - iii. 0.4305
 - iv. 0.9227
8. Patients attending a clinic at the rate of 6 patients in each hour. If the doctor is taking 10 minutes to test any patient, find the probability that at least one person to be in the queue during the first 10 minutes interval.
- i. 0.2642
 - ii. 0.3679
 - iii. 0.6321
 - iv. 0.7358
9. A Nescafe machine discharges on an average 30 milliliters per cup with a standard deviation of 4 milliliters. What will be the probability of overfilling a 35ml cup ?
- i. 0.0062
 - ii. 0.1056
 - iii. 0.8944
 - iv. 0.9938

10. A risky investment yield following cash inflows.

Cash inflow - f_i	Rs. 25,000	Rs. 20,000	Rs. 15,000	Rs. 10,000
Probability - p_i	0.15	0.20	0.30	0.35

What will be the expected cash inflow of this investment?

- i. Rs. 12,500
- ii. Rs. 15,750
- iii. Rs. 17,500
- iv. Rs. 18,750

(Total 30 Marks)

PART II

Answer **any five (05)** questions only

Question No. 01

- i. Telephone interviewer method and face to face interviewer method are very popular methods used in the data collection process. Mention two disadvantages in the face to face interviewer method compared to telephone interviewer method.

(02 Marks)
- ii. List out four (04) important points to be considered in preparing a questionnaire for the data collection.

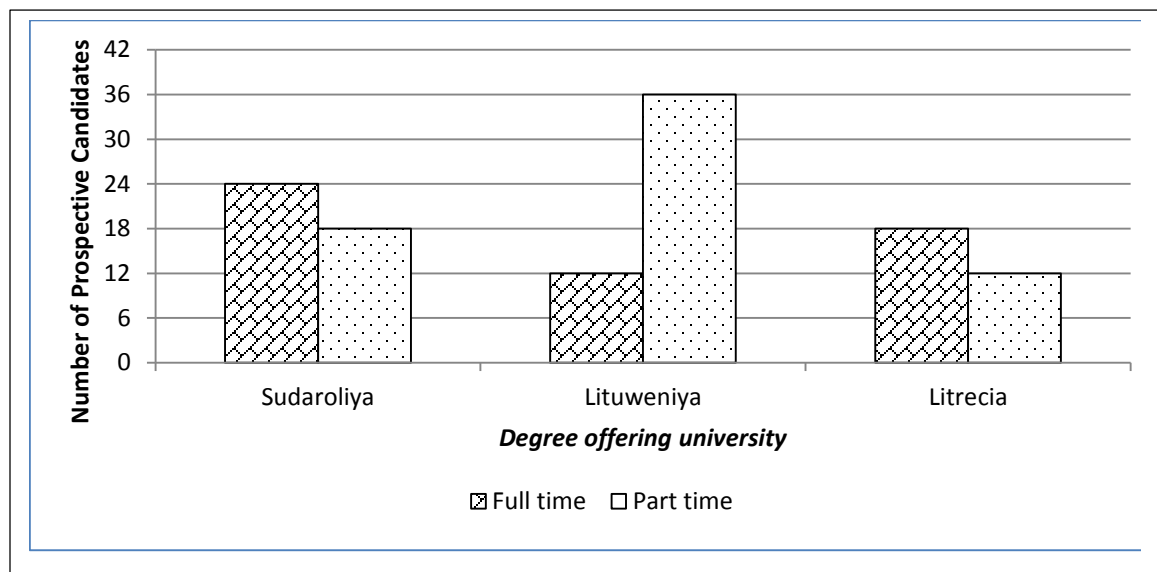
(04 Marks)
- iii. In the data collection process sampling survey is more advantageous compared to census survey. But sampling survey itself has certain disadvantages. List out two disadvantages in sampling survey compared to census survey in the data collection.

(02 Marks)

(Total 08 Marks)

Question No. 02

Institute of Business Studies is going to facilitate three Business degree programs in 2017 offered by three major universities in the world; University of Sudaroliya, University of Kituweniya and University of Litretia, both on full time and part time basis. In order to educate prospective candidates about these programs they had a stall at the Higher Educational Exhibition held on last December, during which they asked the visitors to fill a form indicating the most preferred university and whether they were preferred for a part time or a full time degree. The bar chart given below is drawn using the collected information at the exhibition.



i. In getting a degree, for which university was there a

- Maximum demand
- Minimum demand

(02 Marks)

ii. Mention two other important comments that you can make from the above chart.

(04 Marks)

iii. Find the probability that a selected candidate is willing to follow a degree at University of Lituweniya given that he/she wants to follow a full time degree.

(02 Marks)

(Total 08 Marks)

Question No. 03

One of the problems faced by the *CHICKERBORN INDUSTRIES* is that the regular absenteeism of its employees. Therefore, they collected data on the number of days absent by each employee during 2015 and presented in the following table.

Number of Days Absent by each Employee	Number of Employees
0 – 5	42
5 – 10	61
10 – 15	37
15 – 20	23
20 - 25	16

Calculate

- i. Mean number of days absent by an employee

(04 Marks)

- ii. Standard deviation of the number of days absent by an employee

(04 Marks)

(Total 08 Marks)

Question No. 04

Ruvilal is a poor boy studying in grade ten at Rockhill Junior School. He decided to sell three most popular weekend newspapers; *Weekend Digest*, *News Magazine* and *Fresh News* by visiting each door step in Sunday mornings to collect his pocket money for the forthcoming week. However, to decide how many of each newspaper to sell, he asked those people in the area, what are they willing to buy. He collected information from 60 such villagers and presented below.

Thirty of them willing to buy *Weekend Digest*, 35 willing to buy *News Magazine*, and 29 willing to buy *Fresh News*. Five of them willing to buy all three newspapers, twelve willing to buy both *News Magazine* and *Weekend Digest* but not *Fresh News*. Thirteen willing to buy both *News Magazine* and *Fresh News* and six willing to buy only the *Weekend Digest*.

- i. Represent the above information in a Venn diagram.

(04 Marks)

- ii. Using the Venn diagram, you presented in part (i) above, find the probability that a randomly selected villager is
- not willing to buy any of the three newspapers
 - willing to buy only *News Magazine*
 - willing to buy both *Weekend Digest* and *Fresh News* but not the *News Magazine*
 - willing to buy only two newspapers

(04 Marks)

(Total 08 Marks)

Question No. 05

Given below are the cash flows for the first two years of a risky investment project.

First Year	Cash inflow	Rs. 10,000	Rs. 15,000	Rs. 25,000	Rs. 30,000	Rs. 30,000
	Probability	0.10	0.15	0.25	0.30	0.20

Second Year	Cash inflow	Rs. 25,000	Rs. 35,000	Rs. 40,000	Rs. 50,000	Rs. 60,000
	Probability	0.20	0.25	0.30	0.15	0.10

Calculate the following for each year separately

- i. Expected value

(02 Marks)

- ii. Standard deviation

(04 Marks)

- iii. Coefficient of variation

(02 Marks)

(Total 08 Marks)

Question No. 06

A soft-drink machine discharges an average of 40ml per cup with a variance of 16ml. If 45ml cups were used to serve soft drink, assuming the fillings are normally distributed

- i. Find the probability of overfilling a 45ml cup.

(04 Marks)

- ii. How large a cup is required so that the probability of overfilling the cup will be only 5 percent?

(04 Marks)

(Total 08 Marks)

PART III

Answer **ALL** Questions

Question No. 01

THE CREZEENA SUPPER SPORTS is a popular sales center of different sports goods imported to Sudaroliya from many other countries around the world. They initiated many activities to improve their market share in sports goods market, but with mixed fortunes. Their main advertising comes through the Sudaroliyan main television network (STN), which cost them millions of rupees each year. Therefore, in order to identify the viability of this investment, *THE CREZZENA SUPER SPORTS* collected data on their sales revenue in each month (in rupees millions) and the expenditure on advertising over STN in each previous month for 2015 (in rupees millions) and presented below.

Advertising Expenditure	Sales Revenue
1.82	365
1.61	327
1.74	352
1.71	346
1.76	361
1.46	345

Advertising Expenditure	Sales Revenue
1.47	314
1.62	333
1.65	339
1.84	367
1.44	312
1.56	319

- Assuming advertising expenditure as the independent variable and the sales revenue as the dependent variable, construct a table to obtain the values for $\sum(X - \bar{X})^2$, $\sum(Y - \bar{Y})^2$ and $\sum(X - \bar{X})(Y - \bar{Y})$.
(08 Marks)
- Calculate the Pearson's Correlation Coefficient and comment on the result.
(03 Marks)
- Using the table you construct in part (i), fit a simple linear regression model for the above data.
(02 Marks)

- iv. *CREZEENA SUPER SPORTS* is planning to spend Rs. 1.35 million rupees as the advertising expenditure in this month. What will be the expected sales revenue in the next month?

(02 Marks)

(Total 15 Marks)

Question No. 02

Motor Traffic Department in Sudaroliya has taking various initiatives in reducing the number of deaths occur through vehicle accidents. They were able to convert the prevailed increasing trend in the number of deaths to a declining trend with much effort, even though it occurred at a very slow pace. But what they were highly worried about is the fluctuation in the number of deaths occurred in different quarters. Thus they have collected data on the number of deaths occurred in each quarter over the last three years and presented below.

	Q ₁	Q ₂	Q ₃	Q ₄
2012	72	68	81	75
2013	70	64	73	67
2014	64	58	69	63

- i. Use quarterly death figures to obtain the moving average trend for each quarter.
- ii. Using the trend values you obtained in part (i) above and assuming the additive model calculate the seasonal indices for each quarter.
- iii. Using the trend values and seasonal indices you calculated in parts (i) and (ii) above, forecast the expected number of deaths to be occurred due to road accidents in the third quarter of 2016.

(03 Marks)

(Total 15 Marks)