



**UNIVERSITY OF RUHUNA – FACULTY OF MEDICINE**

**MEDICAL LABORATORY SCIENCES DEGREE PROGRAMME**

**Continuous Assessment Test – Year 1 Term 1 BASIC STATISTICS**

**6<sup>TH</sup> BATCH OF STUDENTS – 20 October, 2014**

INDEX NO:.....

TIME: One hour (9-10 am)

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Answer all questions (one Hour)

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1.1 A Medical Laboratory Scientist is planning to investigate Blood Cholesterol data of patients who had come to his Medical laboratory to check their Lipid Profile over the last year. He is interested in identifying the relationships of Blood Cholesterol with age, gender, LDL, and HDL of the patients.

1.1.1 What is (are) the variable (s) in the above study? ( 10 marks)

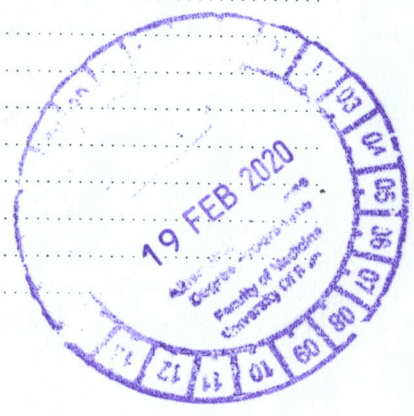
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1.1.2 What is (are) the statistic (s) that can be calculated in the above study? ( 5 marks)

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1.1.3 For each of the variables that you have mentioned above identify the scale of measurement. ( 10 marks)

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**1.2. Give five (5) examples for each of the followings (15 marks)**

1.2.1 Discrete variable

- a. ....
- b. ....
- c. ....
- d. ....
- e. ....

1.2.2 Continuous variable

- a. ....
- b. ....
- c. ....
- d. ....
- e. ....

1.2.3 Nominal variable

- a. ....
- b. ....
- c. ....
- d. ....
- e. ....

**1.3 What are the uses of Statistics in Medical Laboratory Sciences? (10 marks)**

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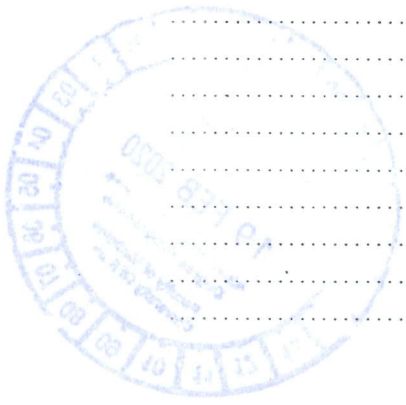
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2.

2.1 Explain briefly the term “descriptive statistics” (12 marks)

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2.2 List 4 measures of dispersion of a data set. (8 marks)

a.....

b.....

c.....

d.....

2.3 List 5 characteristics of the Standard Normal curve. ( 5 marks)

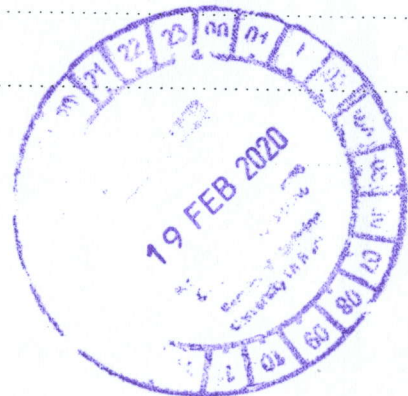
a.....

b.....

c.....

d.....

e.....



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2.4 The sample mean of triglycerides of a sample of 200 patients who had got services from a medical laboratory was 220 mg/dL. ( $SD = 10$  mg/dL).

2.4.1 What is the scale of measurement of triglycerides? (5 marks)

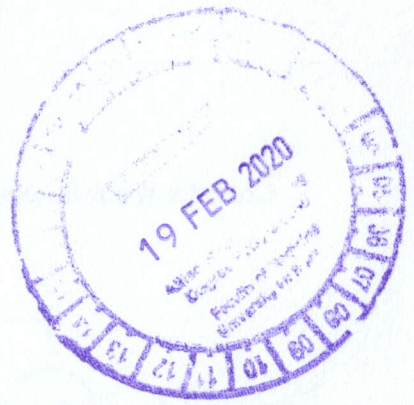
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2.4.2 Calculate the 95% confidence interval of the sample mean of triglycerides (20 marks)

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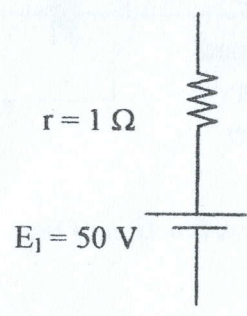


PART B

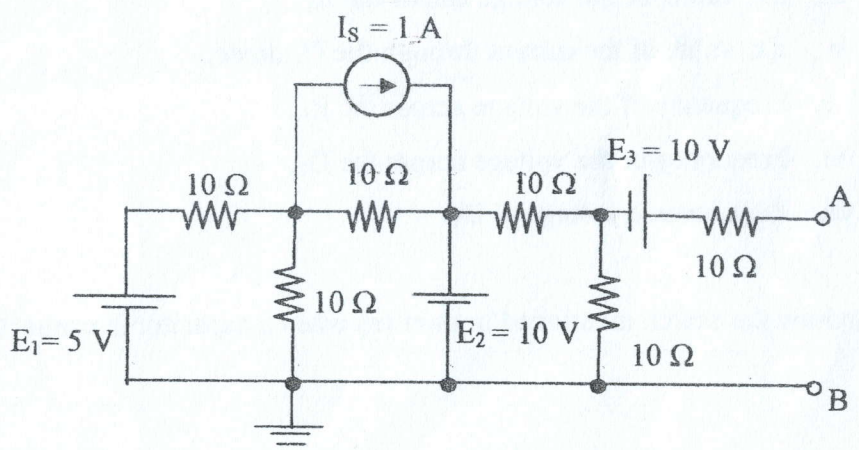
1.

(a) Find the equivalent practical current source for the following practical voltage source.

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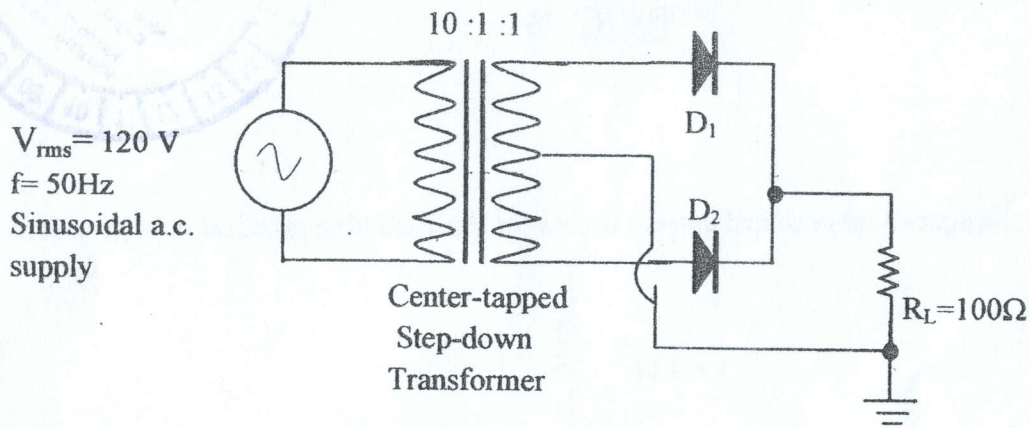
(b) Consider the following circuit



- i Determine the Thevenin's equivalent circuit between the terminals A and B
- ii Determine the Norton's equivalent circuit between the terminals A and B
- iii A student is going to connect a load resistor across the terminals A and B. What would be the value of this load resistor in order to obtain maximum output power?

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2. Consider the following rectifier circuit (assume diodes as ideal).



(a). Sketch the voltage across the  $R_L$  as a function of time.

(b). Calculate

- i. d.c. value, of the voltage across the  $R_L$ ,
- ii. r.m.s value, of the voltage across the  $R_L$ ,
- iii. a.c. value, of the voltage across the  $R_L$ ,
- iv. d.c. value of the current through the  $D_1$  diode,
- v. Frequency of the voltage across the  $R_L$ ,
- vi. Frequency of the voltage across the  $D_1$ ,
- vii. Peak inverse voltage of  $D_1$ .

(c). Redraw the sketch mentioned in part (a) when a capacitor is connected across the  $R_L$ .