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**UNIVERSITY EXAMINATIONS 2016/2017**

**SCHOOL OF PURE AND APPLIED SCIENCES**

**DEPARTMENT OF PHYSICAL AND MATHEMATICAL SCIENCES**

**BBIT/BIT/BBM/BCOM**

**VIRTUAL VARSITY**

**UNIT CODE: BMA3102 UNIT TITLE: BUSINESS STATISTICS II**

**DATE: JULY / AUGUST 2017 MAIN EXAM TIME**: **2 HOURS**

***Instructions:***

* ***Answer Question One (COMPULSORY) and ANY other TWO questions***
* ***All workings Must be clearly shown***

**QUESTION ONE (30MARKS)**

1. What do you understand by term ‘sampling’ (2 Marks)
2. State two merits and two demerits of stratified random sampling (4 Marks)
3. Define type I and type II errors (4 Marks)
4. Given that; Sxy = -1186, Sx = 178.258 and Sy=104.288
5. Compute the coefficient of correlation from this information and briefly comment on the value obtained. (5 Marks)
6. Given further that; ∑X = 538, n=10 and ∑Y = 272, by first obtaining the slope/ gradient, write down the regression equation of Y on X i.e. y=a+bx (5 Marks)
7. Cross Lines Group (CLG) has two factories in different parts of the country. Their Resources, including the labour force skills are regarded as identical and both factories were built at the same time. A random sample of output data during a given period has been taken from each factory and converted to standard hours of output per employee. The data are given below:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Factory 1 | 42 | 50 | 43 | 39 | 41 | 49 | 52 | 41 | 46 | 48 |
| Factory 2 | 39 | 45 | 36 | 42 | 52 | 37 | 43 | 41 | 40 | 39 |

You are given that for factory 1 mean = 45.1 and variance = 20.10 and that for factory 2 mean = 41.4 and variance = 21.16.

**Required:**

1. Test the hypothesis that the mean of standard hours for employees in the two factories is the same. (7 Marks)
2. Comment briefly on the conditions of the test and interpret the outcome. (3 Marks)

**QUESTION TWO (20 MARKS)**

Write short notes on the following:

1. Simple random sampling (4 Marks)
2. Systematic random sampling (4 Marks)
3. Stratified random sampling (4 Marks)
4. Purposive sampling (4 Marks)
5. Quota sampling (4 Marks)

**QUESTION THREE (20MARKS)**

1. What do you understand by the term ‘hypothesis testing’ (2 Marks)
2. Two different types of drugs A and B were tried on certain patients for increasing weights, 5 persons were given drug A and 7 persons were given drug B. the increase in weight (in pounds) is given below

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Drug A | 8 | 12 | 16 | 9 | 3 |  |  |
| Drug B | 10 | 8 | 12 | 15 | 6 | 8 | 11 |

Do the two drugs differ significantly with regard to their effect in increasing weight? (Given that v= 10; t0.05 = 2.23) (18 Marks)

**QUESTION FOUR (20 MARKS)**

1. Briefly discuss any four importance of regression in business today (8 Marks)
2. Your younger brother, a fourth form practical geography student wishes to test whether there could be some relationship between annual visits to a local market by all residents surrounding that market. After a well-designed field study he obtains the following figures:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of visits per year | 21 | 13 | 19 | 18 | 17 | 17 | 14 | 20 | 10 | 11 |
| Residence distance from market (KM) | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 |

**Required:**

1. From the information above, what is the dependent variable and what is the explanatory variable? (4 Marks)
2. Using (i) above, obtain the regression equation of Yi on Xi  (10 Marks)
3. Briefly comment on your results. (2 Marks)

**QUESTION FIVE (20MARKS)**

The Coca Cola Company sells four brands of sodas in East Africa. To help determine if the same marketing approach used in Kenya can be used in Uganda and Tanzania, one of the firm’s marketing analysts wants to ascertain if there is an association between the brand of Soda preferred and the nationality of the consumer. She first classifies the population according to the brand of soda preferred i.e. Fanta, Sprite, Coke and Krest. Her second classification consists of the three nationalities; Kenyan, Tanzanian and Ugandan. The marketing analyst then interviews a random sample of 250 Soda drinkers from the three countries, classifies each according to the two criteria and records the observed frequency of drinkers falling into each of the cells as shown in the table below:

|  |  |  |
| --- | --- | --- |
| **Nationality** | **Soda preference** | **Total** |
| **Coke** | **Krest** | **Sprite** | **Fanta** |
| **Kenyan** | 72 | 8 | 12 | 23 | 115 |
| **Ugandan** | 26 | 10 | 16 | 33 | 85 |
| **Tanzanian** | 7 | 10 | 14 | 19 | 50 |
| **Total** | 105 | 28 | 42 | 75 |  |

Based on the above sample data, can we conclude at the 1% level of significance that there is a relationship between the preference of the soda drinkers and their nationality? (10 Marks)