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**University Examinations 2014/2015**

EXAMINATION FOR CERTIFICATE IN BRIDGING MATHEMATICS

**SMB 0104: STATISTICS AND PROBABILITY**

**DATE: DECEMBER 2014 TIME: 1**$\frac{1}{2} $**HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***three*** *questions*

**QUESTION ONE (30 MARKS)**

1. Find the
2. Mean (2 marks)
3. Mean absolute deviation (2 marks)
4. Seventy fifth percentile (2 marks)

for the data below 16,7,10,19,14,12,20,14

1. Define the following terms as used in statistics
2. Sample space (1 mark)
3. Random variables (2 marks)
4. A discrete random variable x takes the following values with the corresponding probabilities.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| x | -4 | -2 | 0 | 2 | 4 | 6 |
| P(x=x) | k | 0.2 | 0.1 | 0.2 | 0.15 | 0.25 |

Find (i) The value of k (2 marks)

 (ii) $p(x=0)$ (1 mark)

 (iii) $p$(x$\leq 0$) (2 marks)

 (iv) E(x) (3 marks)

1. The probability that l hit the bull eye in a dart game is 0.12. Find the probability in eight trials, if l hit it;
2. Exactly 4 times (4 marks)
3. At least once (3 marks)
4. A sample of size 120 is taken on a random variable x and it is found that$ \sum\_{}^{}x=8460$ and $\sum\_{}^{}x^{2}$=716400. Calculate the mean and the standard deviation of x (3 marks)
5. Compute 5-point moving averages for the time series 56,59,45,25,36,58,79. (3 marks)

**QUESTION TWO (10 MARKS)**

In a certain shop, of the customers order coffee with milk, order coffee with lemon while the rest order coffee with neither milk nor lemon. 60% of those ordering coffee with milk take sugar, 50% of those ordering coffee with lemon take sugar while 30% of those ordering coffee with neither milk nor lemon take sugar.

1. Represent this information in a tree diagram (3 marks)
2. Find the probability that a randomly chosen customer takes sugar (4 marks)
3. Given that a customer takes sugar, find the probability that the customer takes milk

(3 marks)

**QUESTION THREE (10 MARKS)**

Twenty staff members of a construction company were surveyed to find out what their weekly wages was in dollars. The results are as follows:

32.7 48.5 48.5 39.1 42.0 28.5 35.5

40.0 36.6 42.5 34.5 44.0 39.5 34.2

35.7 32.8 40.9 33.2 25.6 39.3

a) Present these date in a frequency distribution table. (Start with value 25 and class interval of 5)

(2 marks)

b) Using 37 as an assumed mean, estimate the mean and standard deviation of the data (8 marks)

**QUESTION FOUR (10 MARKS)**

Two fair die labelled 1 to 6 are rolled. Let A be the event that the product of the two numbers showing up is greater than 21 and let B be the event that the product is divisible by 6. Find

1. P(A) (2 marks)
2. P(B) (2 marks)
3. P(AB (3 marks)
4. P(AB) (3 marks)

**QUESTION FIVE (10 MARKS)**

The masses (x) in kilogram of 30 bridging students who arrived the first day was recorded as they reported for the course and the following results calculated. $\sum\_{}^{}x=1530$ and $\sum\_{}^{}x^{2}=80604.$

1. Calculate the mean and the standard deviation (3 marks)
2. Find the mean and the standard deviation if afterwards the weighing machine was discovered to be under weighing them by 2 kg (2 marks)
3. On the second day two students weighing 48 kg and 56 kg were absent. Find the mean and standard deviation of weight of those who were present (5 marks)

**QUESTION SIX (10 MARKS)**

The table below shows the distribution of marks obtained by BCM students in a statistics CAT.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Class | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 |
| Frequency  | 5 | 10 | 15 | 13 | 9 | 6 |

1. Draw an ogive curve representing the given information (6 marks)
2. Estimate from the graph the median and the position of the student who get 55 marks

(4 marks