

SECOND SEMESTER EXAMINATION MAY, 2018

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COURSE NAME: PROBABILITY AND STATISTICS 1

COURSE NUMBER: MA 176

CLASS: MA I

TIME: 3 HOURS

INSTRUCTION: ANSWER ANY THREE QUESTIONS

Q1 The following are weights (in kg) of 80 pigs measured to the nearest 0.01 kilograms.

37.67 36.42 43.57 55.60 57.76 74.60 63.40 73.70
109.46 40.27 97.23 30.63 47.93 63.72 28.30 70.23
42.63 22.27 65.60 57.40 80.93 45.67 42.78 65.23
27.20 52.36 50.72 53.36 28.60 72.20 87.20 48.33
52.30 64.90 19.67 27.32 38.60 77.40 50.72 33.20
50.63 58.73 103.62 63.76 50.36 37.40 35.20 89.40
47.60 83.23 24.23 74.60 84.72 55.50 60.37 67.20
42.74 95.43 105.36 43.60 54.87 57.60 48.98 70.58
52.89 91.30 51.30 33.40 58.60 63.83 93.60 59.89
58.36 64.83 58.60 25.15 100.55 75.22 38.85 90.66

- (i) Construct a frequency distribution for the above data.
- (ii) Calculate skewness for the data set.
- (iii) Find the semi - interquartile range for the distribution
- (iv) What is the probability of a pig weighing at least 70.58kg

Q2. The table below gives the distribution of the ages of patients attending clinic in a day.

Marks	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49
No. of candidates	3	5	4	6	12	15	8	4	2	1

- (a) (i) Draw a cumulative frequency polygon and use it to estimate

- (ii) The inter-quartile range and the 75th percentile.
- (iii) Calculate, using an assumed mean method, the mean and the standard deviation of the distribution.
- (b) A student was asked to compute the mean and standard deviation of a random sample of ten numbers and found the results to be 20 and 15 respectively. He however, realized that two of the numbers, 21 and 13, were wrongly recorded as 12 and 31. Use the correct numbers to obtain the correct values of the mean and standard deviation.

Q3 (a) From the data below calculate :

- (i) The coefficient of skewness
- (ii) The 40th percentile
- (iii) What is the probability that a candidate chosen at random scored at least 40.5%

Marks	1-10	11-20	21-30	31-40	41-50	51-60	61-70
No. of candidates	2	6	30	58	81	65	28

Q4. (a) Define the conditional probability $P(A/B)$ of an event A relative to an event B of positive probability.

- (i) State what it means to say that two events A and B are independent.
- (ii) Prove that if A and B are independent, then their complements are also independent.

(b) (i) Differentiate between Permutation and Combination

(ii) In how many different ways can 5 of 12 Teaching Assistants be chosen to assist with the marking of mid-semester examination questions.

(c). (i) State three Axioms of probability.

(ii) Prove that $P(\bar{A}) = 1 - P(A)$

DR CC NYARKO/ DR LEWIS BREW