



MACHAKOS UNIVERSITY

University Examinations 2020/2021 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS AND STATISTICS

SECOND YEAR SECOND TERM EXAMINATION FOR

DIPLOMA IN SUPPLY CHAIN MANAGEMENT

DIPLOMA IN INFORMATION SCIENCE.

QUANTITATIVE TECHNIQUES.

DATE: 11/6/2021

TIME: 8.30-11.30 AM

INSTRUCTIONS:

Answer question one and any other two questions

1. a) explain advantages of using interview as a method of data collection. (10 marks)
- b) a company advertised for a position of a managing director. The number of applicants for the position was 50, out of which 10 were shortlisted for interview. Determine the probability that an applicant selected at random will be;
 - i. Shortlisted for interview
 - ii. Shortlisted for interview and employed as the managing director
 - iii. employed as the managing director, given that he has been shortlisted for interview
 - iv. Shortlisted for interview and not employed as the managing director
 - v. Not shortlisted for interview (20 marks)
- 2 a) Differentiate between each of the following terms as used in financial mathematics:
 - i) Perpetuity and annuity
 - ii) Ordinary annuity and annuity due (5 marks)
- b) The following are the ranks awarded to ten employees in a company by three judges X,Y and Z according to their performance

| employee | Judge x | Judge y | Judge z |
|----------|---------|---------|---------|
| A | 4 | 8 | 8 |
| B | 7 | 5 | 5 |
| C | 10 | 9 | 7 |
| D | 1 | 2 | 1 |
| E | 5 | 4 | 3 |
| F | 2 | 3 | 4 |
| G | 6 | 7 | 6 |
| H | 9 | 10 | 10 |
| I | 8 | 6 | 9 |
| J | 3 | 1 | 2 |

- i) Calculate spearman's rank correlation coefficient for each pair of judges
- ii) Based on the results in (i) above determine the pair of judges that were most consistent in their ranking. (15 marks)

- 3 a) Explain 5 reasons for classification of data (5 marks)
- b) The following information shows the distribution of salaries of employees in a company

| <u>Salary (ksh 000's)</u> | <u>number of employees</u> |
|---------------------------|----------------------------|
| 10-20 | 4 |
| 20-30 | 24 |
| 30-40 | 16 |
| 40-50 | 12 |
| 50-60 | 16 |
| 60-70 | 6 |
| 70-80 | 10 |
| 80-90 | 8 |
| 90-100 | 4 |

Determine the:

- i) Mean salary
- ii) Median salary
- iii) Standard deviation (15 marks)
- 4 a) explain five reasons that make sampling to be preferred to census in the collection of data (10 marks)
- b) The following information shows the contribution to the national income in millions of shillings by three sectors of an economy

| <u>year</u> | <u>mining</u> | <u>agriculture</u> | <u>fishing</u> |
|-------------|---------------|--------------------|----------------|
| 2015 | 150 | 550 | 300 |
| 2016 | 200 | 950 | 100 |
| 2017 | 280 | 700 | 420 |

Present the information in a percentage component bar chart (10 marks)

- c) The following are the sales of a company for the first ten months of the year 2017:

| Month | sales (ksh.million) |
|-----------|---------------------|
| January | 20 |
| February | 18 |
| March | 22 |
| April | 35 |
| May | 27 |
| June | 28 |
| July | 38 |
| August | 33 |
| September | 31 |
| October | 41 |

- i. Using three period moving averages, determine the trend values of the sales
- ii. Based on the results (i), comment on the trend of the sales (10 marks)