**SECTION A**

**FUNDAMENTALS OF BUSINESS STATISTICS – MAY 2013**

Q1. a Q11. d

Q2. b Q12. a

Q3. d Q13. d

Q4. a Q14. c

Q5. a Q15. d

Q6. b Q16. e

Q7. a Q17. d

Q8. b Q18. d

Q9. c Q19. b

Q10. a Q20.

**SECTION B**

**Q1**. (a) (i) Qualitative data is a categorical measurement expressed not in terms of numbers, but rather by means of a natural language description while quantitative data is data that is expressed in numerical form. **A2**

Examples:

Qualitative: (i) Company sector

(ii) Educational qualifications **A2**

Quantitative: (i) Bank balances

(ii) The number of overdrawn accounts **A2**

(b) (i) Average number of queries =**M1**

= , **M1**, **A1**

(ii)

|  |  |  |
| --- | --- | --- |
| Class | Tally marks | No. of queries |
| 0 but less than 20  20 but less than 40  40 but less than 60  60 but less than 80  80 but less than 100 | |||| |||| |  ||||  ||||  |||  | | 11  5  4  3  1 |

**M1 M1 A2**

(iii) I. Mean

|  |  |  |  |
| --- | --- | --- | --- |
| Class | Middle value, x | No. of queries, f | fx |
| 0 but less than 20  20 but less than 40  40 but less than 60  60 but less than 80  80 but less than 100 | 10  30  50  70  90 | 11  5  4  3  1 | 110  150  200  210  90 |
| Total |  | 24 | 760 |

**M1** **M2**

Hence mean = , **M1, A1**

(II) This mean is different because it is an approximation as middle values of the classes were used instead of actual values. **A2**

**(TOTAL : 20 MARKS)**

**Q2**. (a) (i) Use of scatter diagrams: By drawing a scatter graph of the two variables, the pattern of points would suggest the existence or otherwise of a relationship. **A2**

(ii) Using measures of association such as correlation coefficient. A large value of the correlation coefficient would suggest a strong degree of association between the two variables. **A2**

[Also use of Regression analysis, Analysis of Variance when one variable is nominal or ordinal and the other is interval or ratio]

(b) (i) Positive correlation since when the higher the demand for laptops the higher the price and vice-versa. **A2**

(ii) Negative correlation since when average temperatures are low the demand for warm clothing increases hence high sales. **A2**

(iii) Positive correlation since the higher the population the more the consumption and generation of waste and vice versa. **A2**

(iv) Positive correlation since the higher income the more the tax that is paid. **A2**

(c) Let  and  be the event Mangani makes a sale in the morning and afternoon respectively.

Let  and  be the event Pindani makes a sale in the morning and afternoon respectively.

1. P(Mangani makes two sales)

= P( and ), **M1**

= , since making a sale in the morning and afternoon are independent. **M1**

= , **M1, A1**

1. P(Pindani makes at least one sale)

= 1 – P(Pindani makes no sale in the morning and afternoon), **M1**

= , **M1**

=  = , **M1, A1**

**(TOTAL : 20 MARKS)**

**Q3** (a) (i) Measures of central tendency – These give some idea of the *centre* or middle of a set of data. They suggest a ‘middle’ or ‘typical’ level. **A2**

Example: Mean (or median, mode), **A1**

(ii) Measures of spread – They tell us how broadly a set of observations is scattered or spread out or dispersed. **A2**

Example: Standard deviation (or range), **A1**

(b) (i) 1 6 7 8 9

2 6 7 8 9

3 5 5 6 7 8 9

4 5 6 8 9

5 1 5

**M2**, **A2**

(ii) (I) Mode = 35, **A1**

1. Median = **, M2, A1**

(iii) Mean = = = =, **M2**

Then standard deviation = 

Now= 

= , **M2**

Hence standard deviation = , **M1, A1**

**(TOTAL : 20 MARKS)**

**Q4**. (a)

**M1** (Labeled axes), **M1** (Scale), **A2** (Plotting points)

(b) (i) Least squares regression line is , where  and 

Now n = 8, , , , , , **M2**

Then , **M2**

, **M2**

Then = , **A1**

(ii) The line can be used to make forecast of sales given a specified number of quotations. **A2**

(c) Product moment correlation coefficient is



= , **M2**

= , **A1**

Comment:  shows a very strong positive relationship between the number of quotations sent out and sales made. **A1**

(d) Coefficient of determination is , **M1, A1**

Interpretation: A coefficient of determination of 91% implies that the independent variable (number of quotations) explains 91% of the variation in the dependent variable (number of sales), **A1**

**(TOTAL : 20 MARKS)**

Q5. (a) (i) Preference for telephone interviews:

(I) It allows quicker contact with geographically dispersed respondents

(ii) Interviewer probing is possible, **A2**

Non-preference for telephone interviews:

(I) Respondent anonymity is lost

1. Non-verbal responses cannot be observed, **A2**

(ii) (I) Internal data sources are sources that provide data from within an organization eg sales vouchers, salary schedules while external data sources are ones that provide data from outside the organization eg internet, public libraries. **A4**

(II) Advantages:

Internal: easily accessible (also less costly)

External: provide a wide range of available data. **A2**

(b) (i) Two charts:

(I) Component bar chart – For this is discrete data, it may be important to compare total number of applicants for an account type at each of the service centres. **A2**

(II) Multiple bar chart – For this is discrete data, multiple bar charts would be useful in making comparisons between different account types at each service centre and between service centres. **A2**

1. Multiple bar chart (other candidates may construct a component bar chart)

**M1** (Labeled axes), **M1** (Key), **A4** (Correct bars for each account type)

**(TOTAL : 20 MARKS)**