Code : 302304

BBA 3rd Semester Exam., 2020

BUSINESS MATHEMATICS AND STATISTICS—2

Time : 3 hours *Full Marks* : 60

Instructions :

(i) The marks are indicated in the right-hand margin.

(ii) There are ***SEVEN*** *questions in this paper.*

(iii) Attempt ***FIVE*** *questions in all.*

(iv) Question Nos. ***1*** *and* ***2*** *are compulsory.*

1. Choose the correct answer (any *six*) : 2×6=12

(a) A numerical value used as a summary measure for a sample, such as a sample mean, is known as

(i) population parameter

(ii) sample parameter

(iii) sample statistic

(iv) population mean

(b) Statistics branches include

(i) applied statistics

(ii) mathematical statistics

(iii) industry statistics

(iv) Both *(i)* and *(ii)*

(c) To enhance a procedure the control charts and procedures of descriptive statistics are classified into

(i) behavioural tools

(ii) serial tools

(iii) industry statistics

(iv) statistical tools

(d) Individual respondents, focus groups and panels of respondents are categorized as

(i) primary data sources

(ii) secondary data sources

(iii) itemized data sources

(iv) pointed data sources

(e) The variables whose calculation is done according to the weight, height and length are known as

(i) flowchart variables

(ii) discrete variables

(iii) continuous variables

(iv) measuring variables

(f) A method used to examine inflation rate anticipation, unemployment rate and capacity utilization to produce products is classified as

(i) data exporting technique

(ii) data importing technique

(iii) forecasting technique

(iv) data supplying technique

(g) Graphical and numerical methods are specialized processes utilized in

(i) education statistics

(ii) descriptive statistics

(iii) business statistics

(iv) social statistics

(h) The scale applied in statistics which imparts a difference of magnitude and proportions is considered as

(i) exponential scale

(ii) goodness scale

(iii) ratio scale

(iv) satisfactory scale

(i) Review of performance appraisal, labour turnover rates, planning of incentives and training programs are examples of

(i) statistics in production

(ii) statistics in marketing

(iii) statistics in finance

(iv) statistics in personnel management

(j) The range of a correlation coefficient lies in between

(i) $-\infty$ to $+\infty$

(ii) 0 to +1

(iii) −1 to +1

(iv) 0 to $+\infty$

2. Answer any *three* of the following short answer-type questions : 4×3=12

(a) Distinguish primary and secondary methods of data collection with examples.

(b) Show that the simple and weighted arithmetic means of the first n natural numbers taking the weights being the corresponding numbers are $\frac{(n+1)}{2}$ and $\frac{(2n+1)}{3}$ respectively.

(c) Define why standard deviation is considered as the best 'measure of dispersion'.

(d) Define conditional concept of probability with a real-life application.

(e) If $u+5x=6$ and $3y-7v=20$ and correlation coefficient between x and y is 0·58, then what would be the correlation between u and v?

Answer any *three* of the following long answer-type questions : 12×3=36

3. *(a)* Construct a frequency distribution table with tally mark and frequency

distribution (inclusive type) with 5 class intervals for the following marks scored by a class of 40 students : 6

[20, 11, 11, 37, 15, 40, 31, 29, 38, 27, 13, 07, 29, 25, 37, 42, 30, 10, 09, 27, 25, 18, 02, 09, 47, 17, 11, 32, 41, 06, 29, 15, 13, 39, 21, 40, 10, 15, 03, 04]

(b) Mean of the following frequency table is 50. Total frequency is 120. For two classes, namely 20–40 and 60–80, frequencies are missing. Find the missing frequencies of those two classes : 6

Class interval	0–20	20–40	40–60	60–80	80–100	*Total*
Frequency	17	?	32	?	19	120

4. *(a)* Calculate standard deviation of the weights of the 100 students of a certain university with the following data : 6

Weight (kg)	60–62	63–65	66–68	69–71	72–74
No. of students	5	18	42	27	8

(b) *(i)* Define classical definition of probability.

(ii) A candidate is selected for interview of Executives for 3 firms *A*, *B* and *C*. The numbers of candidates for the firms *A*, *B* and *C* are 12, 15 and 10 candidates respectively. What are the chances of his/her getting job at least at one firm? 2+4=6

5. *(a)* Discuss business forecasting in terms of strategic aspects of management decisions. 6

(b) Determine the equation of a straight line which 'best fits' the following data : 6

Year	2000	2001	2002	2003	2004
Sale (₹ '000)	35	56	79	80	40

6. *(a)* Define the concept of regression. Why are there always two lines of regression? 4

(b) Equations of two lines of regression are

$$4x+3y+7=0 \text{ and } 3x+4y+8=0$$

Find—

(i) mean value of x and y;

(ii) regression coefficient of b_{xy} and b_{yx};

(iii) correlation coefficient between x and y. 8

7. Discuss the following with management applications (any *three*) : 4×3=12

(a) Scattered diagram—pictorial presentation

(b) Standard deviation

(c) Poisson distribution—properties and business application

(d) Properties of correlation coefficient

(e) Properties of normal distribution

* * *