REFORMED CHURCH UNIVERSITY

FACULTY OF COMMERCE

MASTER OF BUSINESS ADMINISTRATION

BUSINESS STATISTICS

MBA 103

PART 1 SEMESTER 1 EXAMINATION

TOTAL MARKS   [100]

DATE: APRIL 2024

Time: 3 Hours

INSTRUCTIONS

1. This paper has *six (6)* questions
2. Answer question *one (1)* and *any* other *three (3)*
3. Each question carries *25 marks*
4. Start each question on a new page

1. 'Effective entrepreneurship is hinged on statistics' Discuss. (25)

2. (a). Explain the term 'type I (one) error'. (6)
   (b) A company has two manufacturing plants, one in Masvingo and the other one in Harare. The table below shows the number of items produced by each plant for a period of 10 weeks.

Week	1	2	3	4	5	6	7	8	9	10
Masvingo	146	151	149	155	158	152	153	160	157	159
Harare	151	147	139	157	162	154	155	148	156	151

   For each manufacturing plant, calculate:
   (i)   Mean number of items (4)
   (ii)   Standard deviation of items (6)
   (iii) Coefficient of variation (4)
   (iv)   Which plant performs better, why? (5)

3. (a) The time taken by employees to accomplish a task follows a normal distribution with mean 32 minutes and standard deviation 2. Find the probability that the time spent by a randomly selected employee is:

   (i)   At most 35 minutes (4)
   (ii)   At least 27 minutes (4)
   (iii) Between 30 and 33 minutes (5)
   (b) The training manager of ZP Investments wanted to find out if the training workshop that was held was effective. The table below shows the data that were generated.

Employee	A	B	C	D	E	F	G	H	I	J
Units before	27	34	26	25	31	30	29	28	26	32
Units after	28	34	29	27	32	29	28	30	28	31

   (i)   Write down the null hypothesis. (1)
   (ii)   Calculate the t-value. (9)
   (iii) At 5% level of significance, explain why the researcher should accept or not accept the null hypothesis. (2)

4. The number of tonnes of maize seed sold by ABC shops in the four seasons of each year from 2017 to 2020 are presented below:

Season	2017	2018	2019	2020
I	17	38	44	78
II	36	53	76	120
III	56	89	122	154
IV	10	15	30	42

(i) Plot a graph of the time series of quarterly sales of maize seed. (5)

(ii) Calculate the seasonal index for each quarter. (10)

(iii) Calculate the least squares trend line for quarterly sales of maize seed. (5)

Estimate the sales in the season III of 2021 (5)

5. A researcher wanted to find out the relationship between age and computer literacy. The data generated are presented below:

	Employee							
	A	B	C	D	E	F	G	H
Age in years	20	40	29	28	22	25	35	50
Mark in computers	75	55	68	60	70	74	61	51

(i)   Calculate Pearson product moment correlation coefficient (14)

(ii)   Calculate the coefficient of determination (2)

(iii)   Explain the meaning of the answer in (ii) above. (2)

(iv)   Find the regression equation (5)

(v)   Estimate the mark in computers if the age is 30 years (2)

6. The marks of students from different schools in a section of an examination are presented below.

School 1: 22   27   23

School 2: 24   25   20   23

School 3: 30   28   23

School 4: 20   24   19   21   26

School 5: 27   31   34   28

(i)   Write down the null hypothesis (2)

(ii)   Construct an ANOVA table for the data presented. (20)

(iii)   At 5% level of significance, explain why the researcher would accept or not accept the null hypothesis. (3)

END OF PAPER