OEST211

Reg. No. | | | | | | | | |

II Semester B.Sc. (NEP) Degree Examination, October - 2022

STATISTICS

Applied Statistics (Open Elective)

Paper : O.E.1

Time : 2½ Hours **Maximum Marks : 60**

***Instructions to Candidates*:**

1) Graph sheets to be provided.
2) Scientific calculators are allowed.

SECTION - A

I. Answer any **Eight** sub divisions from the following. **(8×3=24)**

1. What is business cycle? Explain.
2. What are standardized death rates (STDR)? Mention its utility.
3. In a community, in a specific year 4000 live births occured, 40 of the mothers died due to child birth. compute maternal mortality rate (MMR).
4. Define crude birth rate (CBR) and General fertility rate (GFR).
5. Explain the lottery method and random number method of drawing a random sample.
6. Explain sampling and non-sampling error.
7. Describe stratified sampling.
8. What is statistical quality control? Discuss its need and utility.
9. Explain the terms
   i) Quality
   ii) Chance and assignable causes of variation.
10. What is a control chart? Discuss the criteria for detecting lack of control in control charts.

|P.T.O.

SECTION - B

Answer any **Three** sub divisions from the following. **(3×12=36)**

11. a) Construct price index numbers from the following data using

i) Laspeyre's

ii) Paasche's.

iii) Marshall Edge worth

iv) Fisher index numbers.

Commodities	2010		2015	
	Price	Quantity	Price	Quantity
A	4	4	6	8
B	7	12	8	7
C	6	14	7	12
D	4	20	3	15

b) Compute cost of living index number.

Item	Base year Price	Current year Price	Weight
Food	135	175	65
Clothing	55	65	20
Fuel	95	115	20
Miscellaneous	55	95	15

(8+4)

12. a) For the following time series calculate the trend by the method of 3 yearly moving averages.

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021
Value	117	111	147	135	150	121	148	137	131

b) For the given time series, fit a straight line trend of the type $y = a + bx$ by the method of least squares. Estimate for the year 2022

Year	2017	2018	2019	2020	2021
Production(In tons)	45	65	89	90	60

(6+6)

13. Compute the crude death rate (CDR) and standardized death rates (STDR) of two populations A and B regarding A as a standard population from the following data.

	Town A		Town B	
Age group	Population	Deaths	Population	Deaths
0-10	2,000	500	10,000	360
10-20	12,000	240	30,000	660
20-40	50,000	1,250	62,000	1,612
40-60	30,000	1,050	15,000	325
60 and above	10,000	50	3,000	180

(12)

14. a) Describe the advantages of sample survey over census.

b) Explain the principle steps in conducting a survey.

c) What are the requisites for a good questionnaire? **(4+4+4)**

15. a) Sample subgroups of size 4 of polyster yarns are drawn at regular intervals of one hour each from a production process. The tensile strength in grams of these yarns are measured. The sample means and sample ranges are given below:

Subgroup No.	1	2	3	4	5	6	7	8	9	10
Sample mean	1,842	1,853	1,876	1,867	1,840	1,874	1,810	1,843	1,870	1,830
Sample range	14	21	18	18	32	53	47	42	41	52

Analyse the data on $\overline{X}$ and R charts.

b) Explain single sampling plan. **(8+4)**