

31/5/24



**DOON UNIVERSITY, DEHRADUN**  
**End Semester Examination, 4<sup>th</sup> Semester, 2024**  
**Academic Year 2023-24(Even Semester)**  
**School of Social Sciences, Department of Economics**  
**Programme Name: B.Sc. Economics**  
**Course Code with Title: ECC252-Statistics-II (814112)**

*Time Allowed 2.00 Hours*

*Maximum Marks: 50*

**INSTRUCTIONS:**

1. *There are three sections.*
2. *Section A consists of five questions. All questions are compulsory in this section.*
3. *Section B consists of three questions. Attempt any two questions in this section.*
4. *Section C comprises three questions. Attempt any two.*
5. *Any candidate found using a scientific calculator during the examination will face immediate disqualification and potential disciplinary actions.*

**SECTION: A -All questions are compulsory (5\*2=10 marks)**

Ques 1. Describe briefly the components of the time series.

Ques 2. What do you understand by **TYPE I** and **TYPE II** errors?

Ques 3. What is Poisson's distribution? Mention two applications of Poisson distribution.

Ques 4. State the properties of a good estimator.

Ques 5. From the following data obtain the trend values by using the method of semi-averages, where the average is taken as the median:

Year	values	year	values
2000	50	2005	33
2001	36	2006	39
2002	43	2007	42
2003	44	2008	41
2004	37	2009	35

**SECTION: B - Attempt any two (2\*10=20marks)**

Ques 6. 10 candidates appeared at two-semester examinations. They scored the following marks in the same order in Sem I and Sem II. Has there been a significant improvement in their scores?

Sno.	1	2	3	4	5	6	7	8	9	10
Sem I	67	24	57	55	63	54	56	68	33	43
Sem II	70	38	58	58	56	67	68	75	42	38

[ $t(2.262)$  at 5% level of significance for 9 degree of freedom]

Ques 7. Fit a straight-line trend by the method of least square and estimate the production for 2005 and 2010 to the following data:

Year	2000	2002	2004	2006	2008
Production '000 Tons	18	21	23	27	16

Ques 8. From the data given below about the treatment of 250 patients suffering from a disease, state whether the new treatment is superior to the conventional treatment.

Treatment	favorable	Non-favorable	Total
New	140	30	170
Conventional	60	20	80
Total	200	50	250

$$X^2_{0.05} = 3.84$$

**SECTION: C – Attempt any two (2\*10=20marks)**

Ques 9. Explain all the Probability and Non-probability sampling methods.

Ques 10. A factory manager wishing to buy machines for a certain operation in a production process obtains one machine from each of the four companies making such machines and puts three men each of whom works one day on each of four machines in random order. The resulting units are given in the table below:

Workmen \ Machines	W1	W2	W3
M1	92	93	94
M2	94	96	98
M3	97	97	100
M4	98	99	99

Discuss the significance of variance of production among the different types of machines and also among workers. (1% value of F for 2,6 and 3,6 degrees of freedom are 10.92 and 9.78 respectively)

Ques 11. Two laboratories A and B carry out independent estimates of fat content in ice cream made by a firm. A sample is taken from each batch, halved, and the separate halves are sent to the two laboratories using the same testing technique. The fat contents obtained (in grams) by the laboratories are recorded below:

Batch no.	1	2	3	4	5	6	7	8	9	10
Lab A	7	8	7	3	8	6	9	4	7	8
Lab B	9	8	8	4	7	7	9	6	6	6

Is there a significant difference between the mean fat content obtained by the Two laboratories A and B? The table value of t for 18 d.f. at 5% level of significance is 2.10.