

January to June Semester, 2021 Final Examination
 Department of Agricultural Economics and Social Sciences
MS in Agricultural Economics
 Chittagong Veterinary and animal Sciences University
 Course Title: Econometrics (Theory)
 Course Title: ECM-601
 Full Marks: 40 Time: 2 hours

Answer any 4 from the following questions. Values are shown in the right margin in each question

1. a) What is meant by the Correlation? Explain with an example. 5
 b) A study was made to determine the relation between weekly advertising expenditure and sales of a poultry feed and the data recorded are: 5

Expenditure (in thousand tk)	40	20	25	20	30	50	40	20	50
Sales (in thousand tk)	363	405	395	345	484	397	490	436	601

Draw a Scatter Diagram and fit the regression line to predict weekly sales from advertising expenditures.

2. The following data refer to the weight of chickens(in kg) of the current batch in a poultry farm:
 1.2, 1.1, 0.9, 1.25, 1.11, 1.05, 1.2, 1.25, 0.95, 0.9, 1.2, 0.9, 0.85, 1.04, 1.1, 1.5, 0.89, 1.1, 1.01, 1.12.

- a) Test whether the mean weight is less than 1 kg? 5
 b) Suppose the weight of chickens increased 0.2 kgs per chicken after applying feed A for six months. Test whether there is any significant difference between the given data for feed A and another data of the sample of 15 chickens with mean weight of 1.0 kg and sd 0.02 kg? 5

3. a) Derive the formula to test a population mean with a specific value in case of known population variance 5
 b) The authority of Aarong claims that the selling price of their certain dairy product is very standard and it is 150 tk per unit with standard deviation of 45tk. Consumer's Association of Bangladesh wants to clarify this price using statistical procedure. A random sample of the selling prices of 100 products were collected from Aarong. The average price per unit was 151tk. Can CAB conclude at 5% level of significance that the average price is standard? 5

4. a) Explain errors in hypothesis 4
 b) Two groups of 20 cows were fed 2 different feeds (C & D). At the end of the experiment, the following sample means and variances were calculated. Is there any significant difference between the given 2 feeds? 6

Particulars	Feed C	Feed D
Mean	5.2	6.1
Variance	.18	.24

5. a) Explain Level of significance. 4
 b) A certain drug is effective in curing cold. In an experiment on 500 farm owners suffering from cold, half of them were given sugar pills and half of them were given drug. Can you say that the drug is helpful in curing cold? The reaction to the treatment on patients are recorded as below: 6

	Helped	Harmed	No effect
Sugar pills	130	40	80
Drug	150	30	70

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Questions are of equal value. Answer any **04 (four)** questions of the following:

1. Consider the Production Function:

$$y=8x^2 -2x^3$$

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| 1. | a) | Derive the exact Marginal Physical Product (MPP) and Average Physical Product (APP) (when $x=2$). | 5.0 |
| | b) | Explain classical 3-stage production function for single factor variation. | 5.0 |
| 2. | a) | What do you mean by Rate of Technical Substitution (RTS)? | 5.0 |
| | b) | Show the relationship between MPP and APP. | 5.0 |
| 3. | a) | Illustrate MVP, Salvage value and Acquisition cost. | 5.0 |
| | b) | Briefly discuss the theory of Asset Fixity. | 5.0 |
| 4. | a) | Define return to scale. | 5.0 |
| | b) | Explain different returns to scale for a 3- stage production function using function coefficient (ϵ). | 5.0 |
| 5. | a) | Discuss Cobb-Douglas Production function with advantages and disadvantages. | 5.0 |
| | b) | Proof that this function assumes constant elasticity of production. | 5.0 |
| 6. | a) | Illustrate isocline and ridgeline with suitable diagram. | 5.0 |
| | b) | Briefly discuss the role of agricultural production economist in context of Bangladesh. | 5.0 |

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