U.G. 6th Semester Examination 2022

ECONOMICS (Honours)

Paper Code : SEC-2 A, B & C

Full Marks : 32 Time : Two Hours

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

SEC-2 A

(Data Analysis and Applied Economics)

Group - A

Answer any *four* of the following questions. 2×4=8

1. What do you mean by 'Sample Design'?

2. Two dices are thrown at a time and the sum of numbers on the faces up is noted. What is the probability of getting exactly 11?

3. When autocorrelation is present, the standard error of OLS estimator becomes _____.

4. What do you mean by 'Consistency' of an estimator?

5. If all the observations in a given data are multiplied by 5, what will be the effect on correlation coefficient (r)?

6. The Keynesian consumption function is given by the equation $C = 1820 + 0.65y$, where C and y are consumption and income respectively. What is the value of MPC here?

Group - B

Answer any *four* of the following questions. 4×4=16

7. Discuss the Generalised Least Square (GLS) method to overcome the problem of heteroskedasticity.

[P.T.O.]

8. In a contest, two judges ranked seven candidates in order of their preference as in the following table :

CANDIDATES :	A	B	C	D	E	F	G
Rank by Judge 1 :	2	1	4	5	3	7	6
Rank by Judge 2 :	3	4	2	5	1	6	7

Calculate the Spearman's rank correlation co-efficient.

9. In a two variable linear model $Y_i = \alpha + \beta X_i + \varepsilon_i$, show that $\hat{\beta}$ is unbiased.

10. Write a note on 'Simple Random Sampling'.

11. Describe Goldfeld-Quandt test for detection of heteroskedasticity.

12. A factory has five sections employing 105, 185, 130, 95 and 125 workers. The mean earnings in a certain week are Rs.2756, Rs.2996, Rs.3040, Rs.3638 and Rs.2838 for five sections respectively. Determine the mean earning of the whole factory.

13. Five persons A, B, C, D and E occupy seats in a row at random. What is the probability that A and B sits next to each other?

14. Consider the following wage-determination equation :

$$\hat{W}_t = \underset{(1.129)}{8.582} + \underset{(0.080)}{0.364}(PF)_t + \underset{(0.072)}{0.004}(PF)_{t-1} - \underset{(0.658)}{2.56}\,U_t$$

$R^2 = 0.873$ $\quad$ $df = 15$

where, W = Wages and salaries per employee

PF = Prices of final output at factor cost

U = Unemployment in the country as a percentage of the total number of employees in the country

t = Time

(the figures in the parentheses are the estimated errors)

Interpret the above equation.

[P.T.O.]

Group - C

Answer any *one* of the following questions. 8×1=8

15. The following data shows the GDP of the countries A and B in the last 10 years (in thousand crore rupees). Find out which economy is more stable.

COUNTRY A :	35	54	52	53	56	58	52	50	51	49
COUNTRY B :	108	107	105	105	106	107	104	103	104	101

16. Explain the steps involved in the chow test for examining the stability of the estimated regression.

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SEC-2-B

(General Equilibrium and Welfare Economics)

Group - A

Answer any *four* of the following questions. 2×4=8

1. Differentiate between Partial Equilibrium and General Equilibrium.
2. Define offer curve.
3. Define rate of product transformation (RPT).
4. Define : (a) Free goods.

   (b) Normal goods.

   (c) Homogeneous goods.

   (d) Giffen goods.
5. What is the "First theorem of Welfare Economics"?
6. Differentiate between Externality and Public Goods.

Group - B

Answer any *four* of the following questions. 4×4=16

7. Explain in brief the concept of property rights.
8. Define social indifference curves and explain its properties.
9. Briefly explain the concept of Coase Theorem.
10. Explain the concept of Social Welfare Function.
11. Differentiate between principle of compensation and pareto optimality.
12. Explain the theory of second best and optimal intervention.
13. Diagrammatically explain the concavity of PPF.

14. Explain the implications of Walras law.

Group - C

Answer any *one* of the following questions. 8×1=8

15. Diagrammatically explain the concept of contract curve and Pareto set.

16. Explain existence, uniqueness and stability of competitive general equilibrium in multi-markets.

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SEC-2-C

(Input-Output Analysis and Linear Programming)

Group - A

Answer any *four* of the following questions. 2×4=8

1. Define the optimization problem.
2. Define the feasible region in an LPP.
3. What does the column total in a SAM show?
4. Define a Linear programming problem.
5. Define slack in the context of an LPP.
6. Considering the demand condition, why the Leontief's I-O model is called an open model?

Group - B

Answer any *four* of the following questions. 4×4=16

7. How many basic solutions are there in the given set of linearly independent equations :

   $2x_1 - 5x_2 + 6x_3 = 9$
   $6x_1 + x_2 + 18x_3 = 12$

   Find all of them.

8. Prove that : the vectors $a_2 = (1, 2)$ and $a_3 = (3, 5)$ are linearly independent.
9. Food *X* contains 6 units of Vitamin A per gram and 7 units of Vitamin B per gram and costs 12 paise per gram. Food *Y* contains 8 units of Vitamin A per gram and 12 units of Vitamin B per gram and costs 20 paise per gram. The daily minimum requirement of Vitamin A and B are 100 units and 120 units respectively. Find the minimum cost of product mix. Formulate the problem as a LPP.
10. State the Hawkins-Simon conditions in relation to the I-O analysis and explain their economic implications.

11. The technology matrix of an economic system of two industries are $\begin{bmatrix} 0.8 & 0.2 \\ 0.9 & 0.7 \end{bmatrix}$. Test whether the system is as per Hawkins-Simon conditions.

12. Explain the economic importance of the duality theory.

13. Define and derive the basic solution of a system of m linearly independent equations with n unknowns ($n > m$).

14. Prove that the set of vectors containing a null are always linearly dependent.

Group - C

Answer any *one* of the following questions. 8×1=8

15. The following inter-industry transaction table was constructed for an economy for the year 2022 :

Industry	1	2	Final consumption	Total output
1	500	1600	400	2500
2	1750	1600	4650	8000
Labours	250	4800	–	–

Construct technology coefficient matrix showing direct requirement. Does a solution exist for this system?

16. Solve the following LPP applying simplex method :

Maximize, $z_x = 5x_1 + 4x_2$

Subject to $3x_1 + 4x_2 \leq 24$

$3x_1 + 2x_2 \leq 18$

$x_2 \leq 5$ $\quad x_1, x_2 \geq 0.$

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