BACHELOR OF ARTS EXAMINATION, 2024

(2nd Year, 3rd Semester)

ECONOMICS (HONOURS)

PAPER : ECO/B/C3.3

(Mathematical Methods in Economics BII)

Time : Two Hours   Full Marks : 30

Answer *any three* questions :   10×3

1. For a open static input-output model, the input coefficients and the final demands are given as :

    $a_{11} = 0.1, a_{12} = 0.3, a_{13} = 0.3, a_{21} = 0.3, a_{22} = 0.5, a_{23} = 0.3, a_{31} = 0.5, a_{32} = 0.1, a_{33} = 0.2, d_1 = 4, d_2 = 14$ and $d_3 = 7$

    Find out the equilibrium output levels. Find out the change in the level of the output of the industries for change in the final demand for the second and the third outputs.   7+3

2. For a market model given as

    $D_t = a - bP_t$ $a, b > 0$

    $S_t = -c + nP_{t-1}$ $c, n > 0$

    $P_{t+1} = P_t + g(S_t - D_t)$ $g > 0$

    where D, S and P are quantity demanded, quantity supplied and the price. Infer about the nature and stability of the time path of price.   10

(2)

3. (A) Solve the following differential equations :

    (a) $(2y^3 + 3t^2)dy + (6yt + 5t^3)dt = 0$

    (b) $by' + gty = ht$

    (B) Infer about the stability of the following model using phase diagram :

    $2y' - 5y = 3$ 3.5+3.5+3

4. For a model giving the interaction between inflation and unemployment, the required equations are :

    $F_t = \alpha - \beta G_t - T + \gamma \pi_t (\alpha, \beta > 0$ and $0 < \gamma \le 1)$ ---------- (1)

    $\pi_t - \pi_{t-1} = h(F_t - \pi_t) (0 < h \le 1)$ ---------- (2)

    $G_t - G_{t-1} = k(m - F) (k > 0)$ ---------- (3)

    where F, π and G are the inflation rate, expected rate of inflation and unemployment rate.

    Infer about the nature and stability of the time path for π_t and G_t using simultaneous equation model.

    Analyse how the stability conclusion will change if h will take a value greater than 1.   8+2

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