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| **1/Eco/(C)-103** | | |
|  | **2014**  **[**December**]**  **ECONOMICS**  **Mathematics for Economists**  Full Marks: 75; Time: 3 hours  *The figures in the margin indicate full marks for the questions*  Answer **five** questions, selecting at least **one** from each Credit |  |
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|  | **CREDIT – I** |  |
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| 1. | (a) Given the subsets of a universal set, verify the following: | 3+3 |
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|  | Illustrate each case on a Venn diagram. |  |
|  |  |  |
|  | (b) Show that the matrix ‘A’ below is orthogonal: | 9 |
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| 2. | (a) Find the length of the difference between two vectors, using appropriate diagram. | 7 |
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|  | (b) Given the function, find the Hessian matrix and determine the sign of the Hessian matrix evaluating its principal minors. | 3+5 |
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|  | **CREDIT – II** |  |
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| 3. | Given the C.E.S. production function: where.  L and K represent labor and capital respectively. Prove that   1. The given production function is homogeneous of degree one; and 2. Its elasticity of substitution is constant. | 5+10 |
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| 4. | (a) Derive the necessary and sufficiency conditions of utility maximization given the following utility function (U) and budgetary constraint (B) as follows: | 8 |
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|  | (b) Solve the following Linear Programming Problem using Simplex Method: | 7 |
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|  | **CREDIT – III** |  |
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| 5. | (a) Solve and determine the time path whether it is damped/ uniform/explosive fluctuation. | 7 |
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|  | (b) Write an explanatory note on Phase diagram. | 8 |
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| 6. | (a) Write a note on market model with price expectations. | 6 |
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|  | (b) Explain growth model of Solow, How does it vary from Domar growth model? | 7+2 |
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|  | **CREDIT – IV** |  |
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| 7. | (a) Derive the time path of y, given the second order difference equation having constant coefficient and constant term: | 10 |
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|  | (b) Solve: | 5 |
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| 8. | (a) Given the following demand and supply functions, find the inter temporal equilibrium price and determine whether the equilibrium is stable: | 5 |
|  | (b) Explain Samuelson’s multiplier-accelerator interaction model. | 10 |