

B.A. (Honours) Examination, 2017

Semester-IV

Economics

Course: H-8

(Mathematical Economics-I)

Time: 3 Hours

Full Marks: 40

Questions are of value as indicated in the margin.

Answer question no. 1 and **any three** from the rest of the following questions.

1. a) Find the optimum commodity purchases for a consumer whose utility function and budget constraint are $U = q_1^{1.5}q_2$ and $3q_1 + 4q_2 = 100$ respectively.
b) Let a consumer's utility function be $U = q_1^6q_2^4 + 1.5 \log q_1 + \log q_2$ and his budget constraint $3q_1 + 4q_2 = 100$. Show that his optimum commodity bundle is the same as in previous case. What is the reason behind getting same answer in both the case?
3+(3+4)
2. Construct an indirect utility function that corresponds to the direct function $U = \alpha \log q_1 + q_2$. Use Roy's identity to construct demand functions for the two goods. Are these the same as the demand functions derived from direct utility function?
5+5
3. Derive and interpret the Slutsky equations for a consumer with utility function $U = f(x, y)$.
10
4. a) Proof that for CES production function the sum of output elasticities is one.
b) Show that for Cobb-Douglas production function the expansion path is a straight line through the origin.
c) A consumer's demand curve for a good is given by $P = 100 - \sqrt{x}$. Calculate the price elasticity of demand when the price of the good is 40.
3+3+4
5. a) Give an example of equilibrium which is stable according to Marshallian condition but not with Walrasian condition.
b) In the general IS-LM model, what are the comparative-statics effects of a change in proportional income tax rate?
4+6
6. a) Use bordered determinants to check the following function for quasiconcavity and quasiconvexity
 $f(x, y) = yx^{-2}$; where, $x, y > 0$.
b) Find the equilibrium of the following two-person-zero-sum game
6+4

Player B

Player A		B ₁	B ₂	B ₃
	A ₁	16	-8	4
	A ₂	-24	-16	3
	A ₃	1	1	2

7. a) Check whether the following function is concave or convex

$$f(y) = y^3 - 2y.$$

- b) Determine the maximum profit and the corresponding price and quantity for a monopolist whose demand and cost functions are $P = 20 - 0.5q$ and $c = 0.04q^3 - 1.94q^2 + 32.96q$; respectively.
2+8