

BACHELOR OF ARTS EXAMINATION, 2023

(2nd Year, 1st Semester)

ECONOMICS

[MICROECONOMICS BI]

Time : Two Hours

Full Marks : 30

Answer any *five* questions taking at least *two* from each group.

GROUP - A

1. (a) How do we define economic zones of production using ridge lines?
(b) How is a firm's short run supply curve determined in a perfectly competitive market? 3+3=6

2. (a) Define compensating variation and equivalent variation.
(b) Show that compensating variation, equivalent variation and consumers' surplus are same under quasi-linear utility function. (1+1)+4=6

3. Using revealed preference theory show that substitution effect is always negative. Hence, using revealed preference theory decompose the price effect or Slutsky equation in substitution effect and income effect. 3+3=6

[Turn over

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4. Show that a profit-maximizing bundle will typically not exist for a technology that exhibits increasing returns to scale under perfect competition. Let $f(x_1, \dots, x_n)$ be the production function for a firm under perfect competition. Suppose each factor x_i is paid its value marginal product $w_i = p f_{x_i}(x_1, \dots, x_n)$. Show that the total product is exhausted. 3+3=6

GROUP - B

5. Suppose that a consumer has an income stream $(Y_1, Y_2) = (100, 50)$ and can borrow and lend at the interest rate $i = 0.11$. His preferences are represented by the additively separable utility function

$$U(c_1, c_2) = \frac{c_1^{1-\eta}}{1-\eta} + 0.9 \frac{c_2^{1-\eta}}{1-\eta}$$

Find the optimal consumption bundles. Comment whether the consumer is borrower or a lender in first period. Find the amount of savings of the consumer. 5+1=10

6. Consider a portfolio choice in a two-period economy with one risky and one riskless assets. The safe asset gives back the initial investment (it yields one unit of the good at date 1 for each unit invested at date 0). The risky asset returns $R_H = 1.15$ with probability $\pi = 3/5$ and $R_L = 0.8$ with probability $(1-\pi)$ per unit

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- ii) Now suppose there is free entry and exit in this market. New entrants will have the same cost function. What is the equilibrium price, quantity and number of sellers in the long run ?
- iii) The government imposes a sales tax of 2 per unit on producers. Find the effect on market price, quantity and number of firms in the long run. What is the deadweight loss due to the tax? 2+1+1+2=6

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(c) Find her new labour supply level when she is receiving the benefit and compare her income when she is not getting any dole. 2+2+2=6

8. Consider the following indirect utility function :

$$V(p, w) = \begin{cases} \frac{y}{p_x} + \frac{1}{2} \left(2 - \frac{p_y}{p_x} \right)^2 & \text{if } 2p_x > p_y \\ \frac{y}{p_x} & \text{if } 2p_x \leq p_y \end{cases}$$

- (a) Find Marshallian demand for commodities,
 (b) Determine the expenditure function.
 (c) Find out Hicksian demand for commodities. Check the Slutsky equation. 2+1+2+1=6

9. (a) Suppose the long run cost of production milkshakes is $C=0.333Q^3-3Q^2+15Q$. Find out the ranges of output when firm shows economies of scale and diseconomies of scale.
 (b) The market for potato is perfectly competitive. Each seller has a cost function given by $c(q)=8+0.5q^2$ where q is the output produced by the seller. Any seller who stops production has no cost. The inverse demand function is given by $Q=20-p$.
 i) Suppose the number of sellers in the market is fixed at 4. Find the equilibrium price and quantity.

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invested. Consider a consumer who owns initial wealth $W=100$ with preferences represented by $\ln(C)$. Denote the fraction of wealth invested in the risky asset by θ . Let (C_H, C_L) are state contingent consumption bundle.

- (a) Determine (C_H, C_L) in terms of θ .
 (b) Find the expression for expected utility.
 (c) Determine the optimal value for θ that maximises the utility. 2+1+3=6

7. A female worker is limited to working a maximum of 40 hours per week, for a total labour supply endowment of 160 hours per month. The worker has no other source of labour income. If she works she would receive a wage of Rs. 60 per hour. Assume that the utility function is defined over monthly consumption (C) and monthly leisure (l_e) and takes the following form : $U = 3 \log C + 5 \log l_e$.
 (a) Find optimal values for C , l_e and labour supply L . Now suppose government pays a dole of Rs 1200 per month to female workers when she is not working. However, if she still works and also accepts government benefit, then the benefit is reduced by 20% of her labour income.
 (b) Draw the feasible set of the worker and find out the level of labour supply for which his income is same for whether she takes benefit or not.

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