This question paper contains 5 printed pages.]

Your Roll No. ....

1234 **A**

B.Sc. (Hons.)/III

PHYSICS—Paper– XXII (iii)

(Economics)

Time : 3 Hours *Maximum Marks : 38*

(Write your Roll No. on the top immediately on receipt of this question paper.)

*Attempt **five** questions in all, including Question No. **1** which is compulsory. Attempt any **two** questions from Part A and **two** questions from Part B.*

1. (a) Calculate (i) national income and (ii) personal disposable income from the following information (all figures are in Rs. crores):

GDP	6,000
Receipts of factor income from the rest of the world	150
Payments of factor income to the rest of the world	225

Depreciation	800
Indirect taxes minus subsidies	700
Corporate profits	1,200
Dividends	600
Transfer payments to persons	1,300
Personal taxes	1,500

(4)

(b) Consider a market in which the supply and demand functions are:

Demand $Q_D = 500 - 5p$

Supply $Q_S = 10p - 400.$

(i) Determine the price elasticity of supply when the market is in equilibrium.

(ii) What will be the effect of the imposition by Government of a price ceiling of Rs. 50? Use diagrams to explain your answer. (4)

PART-A

2. (a) A Working person has preferences between leisure and consumption. Consumption depends on income, and income on

the number of hours per week that the person works (thus sacrificing leisure), the wage rate per hour being fixed. Use indifference curves to illustrate the person's choice of the number of hours to work.

(b) Suppose that the person receives an inheritance, which is invested so that it yields a given non-wage income per week. Illustrate graphically how this will affect the person's choices. Using the concepts of the substitution and income effects, analyse the likely impact of the inheritance on the number of hours worked per week. (3½ + 4)

3. Compare, using indifference curves, the effects of a cash transfer and an equivalent transfer-in-kind on the welfare of a consumer. Which one would the consumer prefer and why? (7½)

4. A monopolist firm producing a single good sells it in a market where the (inverse) demand curve is $p = f(x)$ (x is the quantity sold and p is the corresponding price). Its output depends on the use of two inputs K and L and is given by the production function $x = F(K,L)$. Prices of the inputs are fixed and are r and w respectively. The firm aims to maximise profits. Show that necessary conditions for this are

$$MP_k = \frac{r}{p\left(1+\frac{1}{e}\right)}, \text{ and } MP_l = \frac{w}{p\left(1+\frac{1}{e}\right)},$$

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Where MP_K and MP_L are the marginal products of K and L, and e is the elasticity of demand. Interpret the condition $\frac{MP_K}{MP_L} = \frac{r}{w}$. (7½)

5. For an economy with two goods which are produced using two inputs, explain what the Edgeworth production box diagram is, and what is meant by the efficiency locus (or contract curve). What conditions must hold for a point to be on the efficiency locus? How is the production possibility frontier related to the efficiency locus? (7½)

PART-B

6. According to the *IS-LM* model, what happens to the interest rate, consumption and investment under the following circumstances?

   (a) The government increases its purchases.

   (b) The government increases taxes.

   (c) The government increases its purchases and taxes by an equal amount. (2½ + 2½ + 2½)

7. Stating your assumptions clearly, discuss the following statement in the context of the IS-LM model: "If wages and all other prices rise in the same proportion, then the level of unemployment will increase." (7½)

8. Consider a small open economy with a fixed price level and perfect capital mobility. What would happen to aggregate income, the

exchange rate and the trade balance under both flexible and fixed exchange rate regimes in response to each of the following?

(a) A fall in consumer confidence about the future induces consumers to spend less and save more.

(b) The introduction of a stylish line of Toyotas makes many consumers prefer foreign cars to domestic cars.

Specify your model and assumptions clearly. (7½)

9. Show graphically how fiscal policy works with perfect capital mobility and fixed exchange rates. What will be the effects of monetary expansion under the same circumstances? (7½)