GENERAL ECONOMICS

Paper – I

Time Allowed: Three Hours

अधिकतम अंक : 200
Maximum Marks: 200

General Instructions

This Question-Cum-Answer (QCA) Booklet contains 72+5 pages. Immediately on receipt of the Booklet, please check that this QCA Booklet does not have any misprint or torn or missing pages or items, etc. If so, get it replaced by a fresh QCA Booklet.

Candidates must read the instructions on this page and the following pages carefully before attempting the paper.

Candidates should attempt all questions strictly in accordance with the specified instructions and in the space prescribed under each question in the Booklet. Any answer written outside the space allotted may not be given credit.

Question Paper in detachable form is available at the end of the QCA Booklet and can be removed and taken by the candidates after conclusion of the exam.
प्रश्न-पत्र के भीतर कहीं भी अपना नाम अथवा अनुक्रमांक अथवा प्रश्न-सह-उत्तर-पत्रित्ता की क्रम सं. न लिखें। किसी भी प्रश्न-पत्र में दिये गए “पत्र-लेखन” प्रश्न के नीचे किसी भी नाम से हस्ताक्षर न करें और न ही इसके नीचे अपना अनुक्रमांक दें।
2. अपनी प्रश्न-सह-उत्तर-पत्रित्ता के भीतर कहीं भी प्रश्नों के वास्तविक उत्तरों के अतिरिक्त कुछ न लिखें।
3. अपनी प्रश्न-सह-उत्तर-पत्रित्ता में से पत्र न फाड़ें। यदि आपको लगता है कि कोई पृष्ठ नहीं है, तो इसके बारे में पर्यवेक्षक/निरीक्षक को सूचित करें।
4. विषयीय रूप में उपलब्ध प्रश्न-पत्र अथवा प्रश्न-पत्र पर कुछ न लिखें। उत्तर केवल निर्दिष्ट स्थान में लिखें।
5. अपनी प्रश्न-सह-उत्तर-पत्रित्ता टेबल पर अकेला न छोड़ें। परीक्षा समाप्त होने के बाद इसे निरीक्षक को सौंपें।

Important Instructions
Candidates should read the undermentioned instructions carefully. Violation of any of these instructions may lead to penalty.

DON'TS:
1. Do not write your Name or Roll number or Serial No. of Question-Cum-Answer-Booklet anywhere inside this Booklet. Do not sign the “Letter Writing” questions, if set in any paper by name, nor append your roll number to it.
2. Do not write anything other than the actual answers to the questions anywhere inside your Question-Cum-Answer-Booklet.
3. Do not tear off any leaves from your Question-Cum-Answer-Booklet. If you find any page missing, do not fail to notify the Supervisor/Invigilator.
4. Do not write anything on the Question Paper available in detachable form or admission certificate. Write answers at the specified space only.
5. Do not leave behind your Question-Cum-Answer-Booklet on your table unattended. It should be handed over to the Invigilator after conclusion of the exam.
Question Paper Specific Instructions

Please read each of the following instructions carefully before attempting questions:

There are THIRTEEN questions divided under THREE sections.

The only question in Section A is compulsory.

In Section B, FIVE out of SEVEN questions are to be attempted.

In Section C, THREE out of FIVE questions are to be attempted.

Candidates should attempt questions/parts as per the instructions given in the section. The number of marks carried by a question/part is indicated against it.

Attempts of questions shall be counted in sequential order. Unless struck off, attempt of a question shall be counted even if attempted partly.

Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

Candidates are required to write clear, legible and concise answers and to adhere to word limits wherever indicated. Failure to adhere to word limits may be penalized.

Answers must be written in ENGLISH only.
ध्यान देने योग्य बातें:
1. मुख्य पृष्ठ पर दिए गए अनुदेशों तथा इस पुस्तिका के अंगले पृष्ठ पर इस प्रश्न-पत्र के लिए दिए गए विशेष अनुदेशों को ध्यानपूर्वक पढ़ें और इसका कड़ाई से अनुपालन करें।
2. प्रश्न-सह-उत्तर-पुस्तिका के मुख्य पृष्ठ पर दिए गए स्वागत में अपना अनुक्रमांक तथा अन्य विवरण लिखें।
3. स्वागत में लिखें और लिखावट को सुस्पष्ट रखें। आवश्यक, चिन्ता, इत्यादि को बनाने के लिए पेंसिल का प्रयोग कर सकते हैं।
4. रफ़ कार्य (कच्ची टिप्पणियाँ) के लिए, इस पुस्तिका के अंत में दिए गए कार्यांक का प्रयोग किया जाना चाहिए। रफ़ कार्य को बाद में पूरी तरह से काटें।
5. यदि आप अपने किसी उत्तर को रद्द करना चाहें तो उसे पेन से काटें और उस पर "रद" लिखें, अन्यथा उसका मूल्यांकन किया जा सकता है।
6. परीक्षा भवन छोड़ने से पहले अपनी प्रश्न-सह-उत्तर-पुस्तिका व्यक्तिगत रूप से निरीक्षक को सौंपें।

DO'S:
1. Read the instructions on the cover page and the specific instructions to this Question Paper mentioned on the next page of this Booklet carefully and strictly follow them.
2. Write your Roll number and other particulars, in the space provided on the cover page of the Question-Cum-Answer-Booklet.
3. Write legibly and neatly in ink. Pencil may be used for drawing diagrams, sketches, etc.
4. For rough work, blank pages provided at the end of this booklet should be used. The rough work should be crossed through afterwards.
5. If you wish to cancel any work, draw your pen through it or write “Cancelled” across it, otherwise it may be valued.
6. Hand over your Question-Cum-Answer-Booklet personally to the invigilator before leaving the examination hall.

(केवल परीक्षकों द्वारा भरा जाए / To be filled by Examiners only)

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सकल योग /Grand Total

X-U-ECO 3
SECTION A

Answer all the following seven parts in about 100 words each: 5x7=35

Q1.(a) Why do we need the constancy assumption of marginal utility of money in Cardinal Utility Analysis? Justify your answer.
Q1(b) Define the method of Compensating Variation of Income and the method of Cost Difference. Why is the latter method superior to the former one?
Q1(c) Distinguish between laws of variable proportions and laws of returns to scale. Find out the elasticity of substitution in the case of fixed coefficient type production function.
Q1(d) Find out the cost elasticity of output at the minimum point of the average cost curve in the short-run.
Q1(e) Define peak-load pricing. How does it differ from third degree price discrimination? Analyse graphically.
Consider the equilibrium of a firm under perfect competition. Find out the condition for normal profit, or supernormal profit or loss (whichever is applicable for the firm) without using the average cost curve. Explain only diagrammatically.
Q1(g) Explain the concept of divergence in the context of social and private welfare.
SECTION B

Answer any five out of the following seven questions in about 200 words each. 18×5=90

Q2. (a) How can you measure the price elasticity of demand at any point on a straight line demand curve?
Q2(b) Compare between price elasticity at a given price and also at a given quantity for a set of parallel demand functions.
Q3. (a) Write down the form of CES production function and interpret its parameters. Show that the Cobb-Douglas production function is a special case of CES function.
Q3(b) Find out the elasticity of substitution of the CES production function.
What do you mean by price discrimination? Under what circumstances is price discrimination profitable? Trace out the equilibrium situation under price discrimination.
State and explain the Kaldor-Hicks compensation principle. How does Scitovsky provide an improvement of Kaldor-Hicks compensation principle?
SPECIMEN
State, prove and give an economic interpretation of Euler’s theorem. Show that at the minimum point of the long-run average cost, the total product is exhausted.
Q7.(a) Consider two regression equations of $y$ on $x$ and $x$ on $y$. Show that the arithmetic mean of two regression coefficients is greater than the correlation coefficient, provided the correlation coefficient is positive. Under which condition do the two regression lines coincide?
Q7(b) In a bivariate distribution, a researcher gets two lines of regression as
\[ 2x - y + 1 = 0 \]
\[ 3x - 2y + 7 = 0 \]
Identify the true regression lines and find the mean of x and y.
Q8.
If a single buyer focuses on a single seller, what are the outcomes likely to appear? Do you think that the exploitation of labour will emerge? Justify in favour of your arguments. Find out the equilibrium condition of a firm in the presence of perfect competition in both the product and input market.
Q9. (a) Let the demand function for a good be

\[ q = A p^\alpha y^\beta \]

where \( q \) = the quantity demanded, \( p \) = the price per unit and \( y \) = the income. What do the parameters \( \alpha \) and \( \beta \) imply and what is the sum of \( \alpha \) and \( \beta \)? Interpret your result.
Q9(b) Consider the utility function \( u = \log x_1 + x_2 \) which is to be maximized subject to the budget constraint \( m = p_1 x_1 + p_2 x_2 \), where \( p_1 \) and \( p_2 \) are the prices per unit of the goods \( x_1 \) and \( x_2 \) respectively, and \( m \) is the income of the consumer. Derive the demand for \( x_1 \) and \( x_2 \) and interpret your results.
Q9(c) Given the demand function and total cost function of a perfectly competitive firm as $p = 32 - X$, $c = X^2 + 8X + 4$, $p$ being price, $c$ being cost and $X =$ output.

Find out the output, price, profit and total revenue corresponding to maximization of total profit.
Q10.(a) Describe the Leontief static open input-output model along with its assumptions.
State the Hawkins-Simon conditions and explain their economic meaning and significance.
Find out the total demand for industries 1, 2 and 3 if the coefficient matrix A and the final demand vector B are as follows:

\[
A = \begin{pmatrix}
0.3 & 0.4 & 0.1 \\
0.5 & 0.2 & 0.6 \\
0.1 & 0.3 & 0.1 \\
\end{pmatrix}
\quad \text{and} \quad
B = \begin{pmatrix}
20 \\
10 \\
30 \\
\end{pmatrix}
\]
Q11.(a) What do you mean by multicollinearity?
How does it affect the precision of estimates?
Consider a simple model

\[ y_i = \beta_2 x_{2i} + \beta_3 x_{3i} + u_i \quad i = 1, 2, ..., n \]

and the variables are in deviation form. The disturbance term \( u_i \) satisfies all the classical assumptions. Suppose \( x_{2i} \) and \( x_{3i} \) are multicollinear. Should you drop either \( x_{2i} \) or \( x_{3i} \) to have precise estimates of the remaining parameters? If so, under what condition are you permitted to do so?
12.(a) Explain the meaning of spurious regression.
Q12(b) How are the values of Durbin-Watson d statistic and R² indicative of spurious regression?
12(c) Show that in the case of spurious regression between $Y_t$ and $X_t$, where both $Y_t$ and $X_t$ are generated by random walks, (i) the errors have a permanent effect; (ii) the variance of the errors is infinitely large. What should you interpret from your result?
13.(a) Explain what do you mean by heteroscedasticity.
Q13(b) Given the model \( Y_i = \beta_1 + \beta_2 X_{2i} + u_i \), where \( E(u_i^2) = \sigma^2 X_i^2 \) and \( i = 1, 2, 3, ..., n \), find out the OLS and GLS variance of the regression slope.
Q13(c) Show that if $X_i$ takes the values 1, 2, 3, 4, 5, $\text{Var}(\hat{\beta}_2) > \text{Var}(b_2)$, where $\hat{\beta}_2$ is the OLS estimator of $\beta_2$ and $b_2$ is the GLS estimator of $\beta_2$. 

SPECIMEN