DU MPhil Phd in Economics

Topic:- DU_J19_MPHIL_ECO

1)

Two people meet at a party and are from the same neighborhood of 1000 people. They each have 50 friends. Assume that knowing one person's friends does not give us any information about who the other person's friends are. The expected number of their mutual friends they have is

[Question ID = 2094]

1. 50 [Option ID = 8375]
2. 2.5 [Option ID = 8374]
3. 5 [Option ID = 8373]
4. 25 [Option ID = 8376]

Correct Answer :-

- 5 [Option ID = 8373]

2)

Consider **Scenario 2 (this scenario appears in multiple questions):**

Trader 1 is endowed with 100 identical Left shoes. Trader 2 is endowed with 99 identical Right shoes. Each trader's utility from her allocation of shoes is equal to the number of complete pairs of shoes in the allocation. Traders 1 and 2 trade shoes in competitive markets and arrive at a competitive equilibrium. Assume that shoes are infinitely divisible.

Question: An equilibrium allocation of shoes gives trader 2

[Question ID = 2112]

1. at least 99 Left shoes [Option ID = 8446]
2. at most 50 Right shoes [Option ID = 8448]
3. at most 99 Left shoes [Option ID = 8447]
4. at most 50 Left shoes [Option ID = 8445]

Correct Answer :-

at most 50 Left shoes

- [Option ID = 8445]

---

3) Consider **Scenario 1 (this scenario appears in multiple questions):**

Consider utility functions

$$u_1(x,y) = \begin{cases} 2x, & \text{if } y/x > 2 \\ \max\{x,y\}, & \text{if } y/x \in [1/2, 2] \\ 2y, & \text{if } y/x < 1/2 \end{cases}$$

and

$$u_2(x,y) = \begin{cases} 2x, & \text{if } y/x > 2 \\ x+y, & \text{if } y/x \in [1/2, 2] \\ 2y, & \text{if } y/x < 1/2 \end{cases}$$

Let $p_x > 0$ and $p_y > 0$ be the prices of goods x and y respectively. Let $w > 0$ denote wealth (or income).

Question: For $i = 1, 2$, let $h_i(p_x, p_y, U)$ denote the set of solutions of the problem: choose $x > 0$ and $y > 0$ to minimise $p_x x + p_y y$ subject to $u_i(x,y) \geq U$. Let $e_i(p_x, p_y, U) = p_x X + p_y Y$, where $(X, Y) \in h_i(p_x, p_y, U)$.

[Question ID = 2110]

1. None of the above [Option ID = 8440]
2. $h_1(p_x, p_y, U) \supset h_2(p_x, p_y, U)$ [Option ID = 8438]
3. $h_1(p_x, p_y, U) \subset h_2(p_x, p_y, U)$ [Option ID = 8437]
4. $h_1(p_x, p_y, U) = h_2(p_x, p_y, U)$ [Option ID = 8439]

Correct Answer :-

- $h_1(p_x, p_y, U) \subset h_2(p_x, p_y, U)$ [Option ID = 8437]

---

4)

In a roll of two fair dice, X is the number on the first die and Y is the number on the second die. Which of the following statements is true

[Question ID = 2093]

1. $X - Y$ and $X + Y$ are dependent random variables [Option ID = 8370]
2. All of the above [Option ID = 8372]
3. X^2 and Y^2 are independent random variables [Option ID = 8371]

4. X^2 and Y are independent random variables. [Option ID = 8369]

Correct Answer :-

- X^2 and Y are independent random variables. [Option ID = 8369]

5) What is the probability that at least one 6 appears when 6 fair dice are rolled?

[Question ID = 2091]

1. $1-(\frac{5}{6})^6$ [Option ID = 8363]
2. $(\frac{5}{6})^6$ [Option ID = 8361]
3. $\frac{1}{6}$ [Option ID = 8362]
4. $\frac{5}{6}$ [Option ID = 8364]

Correct Answer :-

- $(\frac{5}{6})^6$ [Option ID = 8361]

6)

The price-setting relation determines the real wage paid by firms depending on the level of technology (A) and mark-up m, and is represented by $\frac{W}{P}=\frac{A}{1+m}$. Under the wage-setting relation, the real wage is determined by the level of productivity (A) and the unemployment u. This is represented by $\frac{W}{P}=A(1-u)$. The effect of an increase in the level of technology on the unemployment is:

[Question ID = 2133]

1. Zero [Option ID = 8531]
2. Ambiguous [Option ID = 8532]
3. Negative [Option ID = 8530]
4. Positive [Option ID = 8529]

Correct Answer :-

- Positive [Option ID = 8529]

7)

Consider a two-equation system of simultaneous equations:

The demand function: $q_t = \alpha_1 P_t + \alpha_2 X_t + \varepsilon_{dt}$

The supply function: $q_t = \beta_1 P_t + \varepsilon_{st}$

Which of the following statements are true?

[Question ID = 2108]

1. α_1 and α_2 are not identified but β_1 is identified [Option ID = 8429]
2. Without further restrictions α_1, α_2 and β_1 cannot be identified [Option ID = 8432]
3. α_2 is not identified but α_1 and β_1 are identified [Option ID = 8431]
4. α_1 and β_1 are not identified but α_2 is identified [Option ID = 8430]

Correct Answer :-

- α_1 and α_2 are not identified but β_1 is identified [Option ID = 8429]

8) The efficiency wage theory argues that

[Question ID = 2136]

1. Firms choose to pay a lower wage than the classical equilibrium wage, thus the real wage is lower than the wage at which the labor market clears. [Option ID = 8543]
2. Firms choose to pay a lower wage than the classical equilibrium wage, thus the real wage is higher than the wage at which the labor market clears. [Option ID = 8544]
3. Firms choose to pay a higher wage than the classical equilibrium wage, thus the real wage is higher than the wage at which the labor market clears. [Option ID = 8541]
4. Firms choose to pay a higher wage than the classical equilibrium wage, thus the real wage is lower than the wage at which the labor market clears. [Option ID = 8542]

Correct Answer :-

- Firms choose to pay a higher wage than the classical equilibrium wage, thus the real wage is higher than the wage at which the labor market clears. [Option ID = 8541]

9)

The range of the function $f : \Re \to \Re$ defined by

$$f(x) = \frac{x^2 + x + 2}{x^2 + x + 1} \text{ is}$$

[Question ID = 2123]

1. $[1, \frac{4}{3}]$ [Option ID = 8490]
2. $[\frac{1}{3}, \frac{8}{3}]$ [Option ID = 8492]
3. $(1, \infty)$ [Option ID = 8489]
4. $[1, \frac{7}{3}]$ [Option ID = 8491]

Correct Answer :-

- $(1, \infty)$ [Option ID = 8489]

10)

Consider a linear model with a single explanatory variable $y = \beta_0 + \beta_1 X + \varepsilon$. However, X is endogenous, and the model is therefore estimated using an instrumental variable Z. Denote the OLS estimators of the slope by $\hat{\beta}_1$ and the IV estimator by $\tilde{\beta}_1$. Suppose further that the correlation between X and Z is relatively small. Which of the following is/are true?

(i) The IV estimator $\tilde{\beta}_1$ can have large asymptotic bias

(ii) It may be preferable to use the OLS $\hat{\beta}_1$

(iii) $\text{Var}(\tilde{\beta}_1) > \text{Var}\ (\hat{\beta}_1)$

The best answer is:

[Question ID = 2107]

1. (ii) and (iii) [Option ID = 8427]
2. (i), (ii) and (iii) [Option ID = 8428]
3. (i) only [Option ID = 8425]
4. (iii) only [Option ID = 8426]

Correct Answer :-

- (i) only [Option ID = 8425]

11)

Your budget is such that if you spend your entire income, you can afford either 4 units of good x and 6 units of good y or 12 units of good x and 2 units of y. What is the ratio of the price of x to the price of y?

[Question ID = 2114]

1. $1/2$ [Option ID = 8453]
2. 2 [Option ID = 8454]
3. $1/3$ [Option ID = 8455]
4. $2/3$ [Option ID = 8456]

Correct Answer :-

- $1/2$ [Option ID = 8453]

12)

Suppose that the mark-up over cost is 20% for a representative firm in an economy with labour being a single factor and the wage-setting equation is: $W = P(1-u)$ (where, u = the unemployment rate, P = Price and W = wage rate). Then the natural rate of unemployment is:

[Question ID = 2130]

1. 20% [Option ID = 8517]
2. 13% [Option ID = 8519]
3. 17% [Option ID = 8518]
4. 10% [Option ID = 8520]

Correct Answer :-

- 20% [Option ID = 8517]

13)

A family has two children and it is known that at least one is a girl. What is the probability that both are girls given that at least one is a girl is

[Question ID = 2092]

1. $\frac{3}{4}$ [Option ID = 8367]
2. $\frac{1}{3}$ [Option ID = 8366]
3. $\frac{2}{3}$ [Option ID = 8368]

4. $\frac{1}{2}$ [Option ID = 8365]

Correct Answer :-

- $\frac{1}{2}$ [Option ID = 8365]

---

14)

In a simple open economy framework, an increase in government spending leads to

[Question ID = 2138]

1. A fall in both budget and current account deficits [Option ID = 8552]
2. A rise in both budget and current account deficits [Option ID = 8551]
3. A rise in budget deficit and a fall in current account deficit [Option ID = 8549]
4. A fall in budget deficit and a rise in current account deficit [Option ID = 8550]

Correct Answer :-

- A rise in budget deficit and a fall in current account deficit [Option ID = 8549]

---

15)

A consumer lives for two periods 1 and 2. The lifetime utility function is $U = u(c_1)+\frac{u(c_2)}{(1+\rho)}$. The consumer earns w_1 and w_2 in the two periods, and her consumption c_1 and c_2 satisfies a lifetime budget constraint $c_1 + \frac{c_2}{1+r} = w_1 + \frac{w_2}{1+r}$. Assume that $u(c_t) = \frac{c_t^{1-\sigma}}{1-\sigma}$, $t = 1, 2$. Then, if $r \geq \rho$, it follows that

[Question ID = 2132]

1. None of the above is necessarily true. [Option ID = 8528]
2. $c_1 \leq c_2$ [Option ID = 8526]
3. $c_1 = c_2$ [Option ID = 8527]
4. $c_1 \geq c_2$ [Option ID = 8525]

Correct Answer :-

- $c_1 \geq c_2$ [Option ID = 8525]

---

16)

Consider **Scenario 2 (this scenario appears in multiple questions):**

Trader 1 is endowed with 100 identical Left shoes. Trader 2 is endowed with 99 identical Right shoes. Each trader's utility from her allocation of shoes is equal to the number of complete pairs of shoes in the allocation. Traders 1 and 2 trade shoes in competitive markets and arrive at a competitive equilibrium. Assume that shoes are infinitely divisible.

Question: The equilibrium price of Left shoes divided by the equilibrium price of Right shoes is

[Question ID = 2111]

1. slightly less than 1 [Option ID = 8442]
2. 1 [Option ID = 8441]
3. slightly more than 1 [Option ID = 8443]
4. 0 [Option ID = 8444]

Correct Answer :-

- 1 [Option ID = 8441]

---

17)

Consider **Scenario 1 (this scenario appears in multiple questions):**

Consider utility functions

$$u_1(x,y) = \begin{cases} 2x, & \text{if } y/x > 2 \\ \max\{x,y\}, & \text{if } y/x \in [1/2, 2] \\ 2y, & \text{if } y/x < 1/2 \end{cases}$$

and

$$u_2(x,y) = \begin{cases} 2x, & \text{if } y/x > 2 \\ x+y, & \text{if } y/x \in [1/2, 2] \\ 2y, & \text{if } y/x < 1/2 \end{cases}$$

Let $p_x > 0$ and $p_y > 0$ be the prices of goods x and y respectively. Let $w > 0$ denote wealth (or income).

Question: Let $m_i(p_x, p_y, w)$ denote the set of Marshallian demands for utility u_i and let $v_i(p_x, p_y, w) = u_i \circ m_i(p_x, p_y, w)$. Then,

[Question ID = 2109]

1. $m_1(p_x, p_y, w) \supset m_2(p_x, p_y, w)$ and $v_1(p_x, p_y, w) \geq v_2(p_x, p_y, w)$ [Option ID = 8436]

2. $m_1(p_x, p_y, w) \supset m_2(p_x, p_y, w)$ and $v_1(p_x, p_y, w) = v_2(p_x, p_y, w)$ [Option ID = 8434]

3. $m_1(p_x, p_y, w) \subset m_2(p_x, p_y, w)$ and $v_1(p_x, p_y, w) = v_2(p_x, p_y, w)$ [Option ID = 8433]

4. $m_1(p_x, p_y, w) \subset m_2(p_x, p_y, w)$ and $v_1(p_x, p_y, w) \leq v_2(p_x, p_y, w)$ [Option ID = 8435]

Correct Answer :-

- $m_1(p_x, p_y, w) \subset m_2(p_x, p_y, w)$ and $v_1(p_x, p_y, w) = v_2(p_x, p_y, w)$ [Option ID = 8433]

18)

It is known that there is a rational number between any two distinct irrational numbers. Consider a continuous function $f : \Re \to \Re$ such that $f(x) = \sin x$ for every rational number x. If x is an irrational number, then

[Question ID = 2121]

1. $f(x) = \sin x$ [Option ID = 8484]

2. $f(x) = \sin(x/2) + \cos(x/2)$ [Option ID = 8481]

3. $f(x) = (\sin x)/2 + (\cos x)/2$ [Option ID = 8482]

4. $f(x) = \cos x$ [Option ID = 8483]

Correct Answer :-

- $f(x) = \sin(x/2) + \cos(x/2)$ [Option ID = 8481]

19)

According to the theory of comparative advantage, countries gain from trade because

[Question ID = 2116]

1. Trade makes firms behave more competitively, reducing their market power. [Option ID = 8461]

2. All firms can take advantage of cheap labor. [Option ID = 8462]

3. World output can rise when each country specializes in what its does relatively best. [Option ID = 8464]

4. Output per worker in each firm increases. [Option ID = 8463]

Correct Answer :-

- Trade makes firms behave more competitively, reducing their market power. [Option ID = 8461]

20)

A random variable has a Uniform distribution on the interval $[-1, 1]$. The probability density function of X conditional on $X > 0.3$ is given by

[Question ID = 2097]

1. $10/7$ [Option ID = 8386]
2. 1 [Option ID = 8388]
3. $3/10$ [Option ID = 8387]
4. $7/10$ [Option ID = 8385]

Correct Answer :-

- $7/10$ [Option ID = 8385]

21)

If the marginal propensity to save is 0.3 and the marginal propensity to import is 0.1, and the government increases expenditures by Rs. 10 billion, ignoring foreign-income repercussions, by how much will GDP rise?

[Question ID = 2139]

1. Rs. 15 billion. [Option ID = 8556]
2. Rs. 25 billion. [Option ID = 8555]
3. Rs. 20 billion. [Option ID = 8553]
4. Rs. 10 billion. [Option ID = 8554]

Correct Answer :-

- Rs. 20 billion. [Option ID = 8553]

22)

Scenario 3 (this scenario appears in multiple questions):

Data from a random sample of 107 home sales in 2003 yielded the regression

$$\begin{array}{lllllll} \hat{P} = & 119.2+ & 0.485^*BD+ & 23.4^*BA+ & 0.156^*HS+ & 0.002^*PS+ & 0.090^*A- & 35.6^*PC \\ & (23.9) & (2.61) & (10.76) & (0.011) & (0.00048) & (0.311) & (10.5) \end{array}$$

$R^2 = 0.72$; $SER = 41.5$, P is price or value (Rs. 1000), BD is number of bedrooms, BA is number of baths, HS is house size (sq. ft.), PS is plot size (sq. ft.), A is age (years), PC is a dummy variable = 1 if the house is in poor condition and = 0 otherwise; and the parentheses contain standard errors of the corresponding coefficients. SER is the standard error of the regression.

Question: What is the adjusted coefficient of determination?

[Question ID = 2102]

1. 0.7052 [Option ID = 8408]
2. 0.7032 [Option ID = 8405]
3. 0.7042 [Option ID = 8406]
4. 0.7022 [Option ID = 8407]

Correct Answer :-

- 0.7032 [Option ID = 8405]

23)

Scenario 3 (this scenario appears in multiple questions):

Data from a random sample of 107 home sales in 2003 yielded the regression

$$\begin{array}{lccccccc} \hat{P} = & 119.2 + & 0.485^{*}BD + & 23.4^{*}BA + & 0.156^{*}HS + & 0.002^{*}PS + & 0.090^{*}A - & 35.6^{*}PC \\ & (23.9) & (2.61) & (10.76) & (0.011) & (0.00048) & (0.311) & (10.5) \end{array}$$

$R^2 = 0.72$; $SER = 41.5$, P is price or value (Rs. 1000), BD is number of bedrooms, BA is number of baths, HS is house size (sq. ft.), PS is plot size (sq. ft.), A is age (years), PC is a dummy variable = 1 if the house is in poor condition and = 0 otherwise; and the parentheses contain standard errors of the corresponding coefficients. SER is the standard error of the regression.

Question: If a homeowner converts a bedroom into a bathroom, what is the expected increase in the value of the house?

[Question ID = 2099]

1. Rs. 22,915 [Option ID = 8394]
2. Rs. 22,800 [Option ID = 8393]
3. Rs. 21,800 [Option ID = 8395]
4. Rs. 23,915 [Option ID = 8396]

Correct Answer :-

- Rs. 22,800 [Option ID = 8393]

24)

Scenario 3 (this scenario appears in multiple questions):

Data from a random sample of 107 home sales in 2003 yielded the regression

$$\begin{array}{lccccccc} \hat{P} = & 119.2+ & 0.485^*BD+ & 23.4^*BA+ & 0.156^*HS+ & 0.002^*PS+ & 0.090^*A- & 35.6^*PC \\ & (23.9) & (2.61) & (10.76) & (0.011) & (0.00048) & (0.311) & (10.5) \end{array}$$

$R^2 = 0.72$; $SER = 41.5$, P is price or value (Rs. 1000), BD is number of bedrooms, BA is number of baths, HS is house size (sq. ft.), PS is plot size (sq. ft.), A is age (years), PC is a dummy variable = 1 if the house is in poor condition and = 0 otherwise; and the parentheses contain standard errors of the corresponding coefficients. SER is the standard error of the regression.

Question: If a homeowner adds a new bathroom to her house which increases the house size by 100 sq. ft., what is the expected increase in the value of the house?

[Question ID = 2100]

1. Rs. 39,000 [Option ID = 8400]
2. Rs. 37,000 [Option ID = 8397]
3. Rs. 39,450 [Option ID = 8398]
4. Rs. 37,200 [Option ID = 8399]

Correct Answer :-

- Rs. 37,000 [Option ID = 8397]

25)

You have a single draw from a Bernoulli distribution. The maximum likelihood estimate of the probability of success p is

[Question ID = 2096]

1. strictly between 0 and 1 [Option ID = 8384]
2. either 0 or 1 [Option ID = 8383]
3. 0 [Option ID = 8381]
4. 1 [Option ID = 8382]

Correct Answer :-

0

- [Option ID = 8381]

26) The set $(0, \infty)$ can be expressed as

[Question ID = 2119]

1. $\cup_{n=1}^{\infty}[a_n, b_n]$, where each a_n and b_n is a rational number [Option ID = 8475]
2. $\cup_{n=1}^{\infty}[a_n, b_n]$, where each a_n and b_n is a real number [Option ID = 8474]
3. $\cup_{n=1}^{\infty}(a_n, b_n)$, where each a_n and b_n is a real number [Option ID = 8473]
4. all of the above [Option ID = 8476]

Correct Answer :-

- $\cup_{n=1}^{\infty}(a_n, b_n)$, where each a_n and b_n is a real number [Option ID = 8473]

27)

A random variable X has a standard normal distribution. What is the closest guess to the probability that X lies in the interval $[2, 3]$?

[Question ID = 2095]

1. 0.001 [Option ID = 8377]
2. 0.25 [Option ID = 8379]
3. 0.05 [Option ID = 8380]
4. 0.025 [Option ID = 8378]

Correct Answer :-

- 0.001 [Option ID = 8377]

28)

Scenario 3 (this scenario appears in multiple questions):

Data from a random sample of 107 home sales in 2003 yielded the regression

$$\begin{array}{lllllll} \hat{P} = & 119.2 + & 0.485^{*}BD + & 23.4^{*}BA + & 0.156^{*}HS + & 0.002^{*}PS + & 0.090^{*}A - & 35.6^{*}PC \\ & (23.9) & (2.61) & (10.76) & (0.011) & (0.00048) & (0.311) & (10.5) \end{array}$$

$R^2 = 0.72$; $SER = 41.5$, P is price or value (Rs. 1000), BD is number of bedrooms, BA is number of baths, HS is house size (sq. ft.), PS is plot size (sq. ft.), A is age (years), PC is a dummy variable = 1 if the house is in poor condition and = 0 otherwise; and the parentheses contain standard errors of the corresponding coefficients. SER is the standard error of the regression.

Question: What is the loss in value if a homeowner allows his house to get into 'poor condition'?

[Question ID = 2101]

1. Rs. 34,300 [Option ID = 8401]
2. Rs. 35,100 [Option ID = 8404]
3. Rs. 35,600 [Option ID = 8403]
4. Rs. 36,000 [Option ID = 8402]

Correct Answer :-

- Rs. 34,300 [Option ID = 8401]

29)

Scenario 3 (this scenario appears in multiple questions):

Data from a random sample of 107 home sales in 2003 yielded the regression

$$\begin{array}{lllllll} \hat{P} = & 119.2 + & 0.485^{*}BD + & 23.4^{*}BA + & 0.156^{*}HS + & 0.002^{*}PS + & 0.090^{*}A - & 35.6^{*}PC \\ & (23.9) & (2.61) & (10.76) & (0.011) & (0.00048) & (0.311) & (10.5) \end{array}$$

$R^2 = 0.72$; $SER = 41.5$, P is price or value (Rs. 1000), BD is number of bedrooms, BA is number of baths, HS is house size (sq. ft.), PS is plot size (sq. ft.), A is age (years), PC is a dummy variable = 1 if the house is in poor condition and = 0 otherwise; and the parentheses contain standard errors of the corresponding coefficients. SER is the standard error of the regression.

Question: If variable '*Age*' were measured in decades, what would be its coefficient?

[Question ID = 2104]

1. 9.000 [Option ID = 8415]
2. 0.090 [Option ID = 8413]
3. 0.009 [Option ID = 8416]
4. 0.900 [Option ID = 8414]

Correct Answer :-

- 0.090 [Option ID = 8413]

30)

Consider a simple linear regression model with one explanatory variable: $Y = \beta_0 + \beta_1 X + \varepsilon$. However, Y is measured with error, and so what is estimated, using OLS, is $Y_1 = \beta_0 + \beta_1 X + \varepsilon$ where $Y_1 = Y + u$, with $Cov(Y, u) = Cov(u, \varepsilon) = 0$. Which of the following is/are true?

(i) The estimated $\hat{\beta}_1$ will be biased because of classical measurement error

(ii) The estimated $\hat{\beta}_0$ will be biased because of classical measurement error

(iii) There will be no bias, but the estimated variance of $\hat{\beta}_0$ will be inflated

(iv) There will be no bias, but the estimated variance of $\hat{\beta}_1$ will be inflated

The best answer is:

[Question ID = 2106]

1. (i) and (ii) [Option ID = 8421]
2. (ii) and (iii) [Option ID = 8423]
3. (ii) only [Option ID = 8422]
4. (iii) and (iv) [Option ID = 8424]

Correct Answer :-

- (i) and (ii) [Option ID = 8421]

31)

The maximum value attained by the function $f(x) = x^3 - x^2 - x - 1$ on the set $S = \{x | x^2 - x - 2 \leq 0\}$ occurs at

[Question ID = 2129]

1. $x = 5/2$ [Option ID = 8516]

2. $x = 1$ [Option ID = 8513]
3. $x = 2$ [Option ID = 8515]
4. $x = 1/3$ [Option ID = 8514]

Correct Answer :-

- $x = 1$ [Option ID = 8513]

---

32) $\lim_{x\to\infty}\left(\frac{x^2-x+1}{x+1} - c_1x - c_2\right) = -5$. So, it must be that (c_1, c_2) equals

[Question ID = 2124]

1. $(1, 2)$ [Option ID = 8495]
2. $(1, 3)$ [Option ID = 8496]
3. $(2, 3)$ [Option ID = 8494]
4. $(2, -3)$ [Option ID = 8493]

Correct Answer :-

- $(2, -3)$ [Option ID = 8493]

---

33)

Scenario 3 (this scenario appears in multiple questions):

Data from a random sample of 107 home sales in 2003 yielded the regression

$$\begin{array}{lccccccc} \hat{P} = & 119.2 + & 0.485^*BD + & 23.4^*BA + & 0.156^*HS + & 0.002^*PS + & 0.090^*A - & 35.6^*PC \\ & (23.9) & (2.61) & (10.76) & (0.011) & (0.00048) & (0.311) & (10.5) \end{array}$$

$R^2 = 0.72$; $SER = 41.5$, P is price or value (Rs. 1000), BD is number of bedrooms, BA is number of baths, HS is house size (sq. ft.), PS is plot size (sq. ft.), A is age (years), PC is a dummy variable = 1 if the house is in poor condition and = 0 otherwise; and the parentheses contain standard errors of the corresponding coefficients. SER is the standard error of the regression.

Question: Are the coefficients of BA and PC individually statistically significant at the 5% level?

[Question ID = 2103]

1. Neither coefficient is significant. [Option ID = 8412]

2. The coefficient of BA is significant, but that of PC is not [Option ID = 8409]

3. Both coefficients are significant. [Option ID = 8411]

4. The coefficient of PC is significant, but that of BA is not [Option ID = 8410]

Correct Answer :-

- The coefficient of BA is significant, but that of PC is not [Option ID = 8409]

34)

The formula for the effective tariff rate is given by the following formula:

$$e = \frac{(n - ab)}{1 - a}$$

where e = the effective rate of protection, n = the nominal tariff rate on the final product, a = the ratio of the value of the imported input to the value of the final product, and b = the nominal tariff rate on the imported input.

Suppose that the tariff rate on the final product is 5 percent. If no imported inputs are used in the domestic production of the final product, the effective tariff rate is

[Question ID = 2117]

1. 5 percent [Option ID = 8466]
2. 3 percent [Option ID = 8465]
3. 8 percent [Option ID = 8467]
4. 12 percent [Option ID = 8468]

Correct Answer :-

- 3 percent [Option ID = 8465]

35)

Nitin is a stamp collector and consumes only stamps and cheese sandwiches. His utility function is $u(s, c) = s + \log c$. If Nitin is at a point where he is consuming both goods, then the total amount that he is spending on cheese sandwiches depends

[Question ID = 2115]

1. only on his income [Option ID = 8459]
2. only on the price of sandwiches [Option ID = 8457]
3. on all three of the above [Option ID = 8460]
4. only on the price of stamps [Option ID = 8458]

Correct Answer :-

- only on the price of sandwiches [Option ID = 8457]

36) The matrix $Q = PAP^T$, where P^T is the transpose of the matrix P, and

$$P = \begin{pmatrix} \sqrt{3}/2 & 1/2 \\ -1/2 & \sqrt{3}/2 \end{pmatrix}$$

$$A = \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}$$

Then, $P^T Q^{12} P$ equals

[Question ID = 2125]

1. $\begin{pmatrix} 1 & 144 \\ 0 & 1 \end{pmatrix}$ [Option ID = 8498]

2. $\begin{pmatrix} 1 & 12 \\ 0 & 1 \end{pmatrix}$ [Option ID = 8497]

3. $\begin{pmatrix} 1 & 0 \\ 144 & 1 \end{pmatrix}$ [Option ID = 8499]

4. $\begin{pmatrix} 2+\sqrt{3} & 1 \\ -1 & 2-\sqrt{3} \end{pmatrix}$ [Option ID = 8500]

Correct Answer :-

- $\begin{pmatrix} 1 & 12 \\ 0 & 1 \end{pmatrix}$ [Option ID = 8497]

37)

The random variable X denotes the number of successes in a sequence of independent trials, each with a probability p of success. Let $\overline{X}$ denote the mean number of successes. We know that $\overline{X}$

[Question ID = 2098]

1. approximates a Normal distribution with mean p [Option ID = 8391]
2. has a Normal distribution with mean p [Option ID = 8390]
3. None of the above [Option ID = 8392]
4. has a Binomial distribution with mean p [Option ID = 8389]

Correct Answer :-

- has a Binomial distribution with mean p [Option ID = 8389]

38)

What is the money demand function when the utility of money for the representative household is given by, $U(Y, M/P) = 0.5lnY + 0.5ln(M/P)$ (i represents the opportunity cost of holding money)?

[Question ID = 2135]

1. $M^D/P = Y/(0.5i)$ [Option ID = 8540]
2. $M^D/P = Y/i$ [Option ID = 8537]
3. $M^D/P = 2Y/i$ [Option ID = 8538]
4. $M^D/P = 0.5Y/i$ [Option ID = 8539]

Correct Answer :-

- $M^D/P = Y/i$ [Option ID = 8537]

39)

Suppose that in the Solow Model of an economy with some positive savings rate, population growth rate, and rate of depreciation, k^* is the steady state capital-labour ratio. Suppose k_1 and k_2 are capital-labour ratios such that $k_1 < k_2 < k^*$, and let g_1, g_2 be the growth rates of per capita output at k_1 and k_2 respectively. Then

[Question ID = 2134]

1. $g_1 < g_2$ [Option ID = 8535]
2. $g_1 > g_2$ [Option ID = 8533]
3. $g_1 = g_2$ [Option ID = 8534]
4. None of the above. [Option ID = 8536]

Correct Answer :-

- $g_1 > g_2$ [Option ID = 8533]

40)

Consider a small open economy. If there is a positive productivity shock in the country, how will the domestic capital market be affected?

[Question ID = 2137]

1. There will be net capital inflow. [Option ID = 8545]
2. The investment demand will fall. [Option ID = 8548]
3. There will be net capital outflow. [Option ID = 8546]
4. Net capital inflow is zero. [Option ID = 8547]

Correct Answer :-

- There will be net capital inflow. [Option ID = 8545]

41)

Assume that the aggregate production of an economy is $Y_t = \sqrt{K_t L_t}$, where $K_{t+1} = (1-\delta)K_t + I_t, S_t = sY_t$ and $L_t = L$ (i.e., the notation and meanings correspond to the Solow Model with constant population). Then, the savings rate s that maximizes the steady state rate of consumption equals

[Question ID = 2131]

1. $\delta/(1+\delta)$ [Option ID = 8521]
2. None of the above. [Option ID = 8524]
3. $1/(1+\delta)$ [Option ID = 8523]
4. $1/2$ [Option ID = 8522]

Correct Answer :-

- $\delta/(1+\delta)$ [Option ID = 8521]

42)

Consider a function $f : \Re^2 \to \Re$. Suppose, for every $p \in \Re^2$, there exists $x(p) \in \Re^2$ such that $f(x(p)) \geq 1$ and $p.x(p) \leq p.y$ for every $y \in \Re^2$ such that $f(y) \geq 1$. Define $g : \Re^2 \to \Re$ by $g(p) = p.x(p)$. Then, g is

[Question ID = 2122]

1. linear [Option ID = 8485]

2. concave [Option ID = 8488]

3. quasi-convex [Option ID = 8487]

4. convex [Option ID = 8486]

Correct Answer :-

- linear [Option ID = 8485]

---

43) Let

$$A = \begin{pmatrix} 1 & 1 \\ 1 & 3 \end{pmatrix}$$

Then $A^4 - 4A^3 + 2A^2 + A$ equals

[Question ID = 2127]

1. A [Option ID = 8508]

2. I (the 2×2 identity matrix). [Option ID = 8505]

3. $I + A$ [Option ID = 8507]

4. A^{-1} [Option ID = 8506]

Correct Answer :-

- I (the 2×2 identity matrix). [Option ID = 8505]

---

44)

The function $f(x)$ is twice differentiable, and $f(2) = 4, f(3) = 9, f(4) = 16$. Then, it must be that

[Question ID = 2128]

1. $f''(x) = 2$, for some $x \in (2, 4)$. [Option ID = 8510]

2. $f''(x) = 4$, for some $x \in (2, 3)$. [Option ID = 8511]

3. $f''(x) = 3$, for some $x \in (2, 3)$. [Option ID = 8509]

4. $f''(x) = 3$, for some $x \in (2, 4)$. [Option ID = 8512]

Correct Answer :-

- $f''(x) = 3$, for some $x \in (2, 3)$. [Option ID = 8509]

45)

Let

$$A = \begin{pmatrix} 1 & 0 & 0 \\ 2 & 1 & 0 \\ 3 & 2 & 1 \end{pmatrix}$$

and B_1, B_2, B_3 be three 3×1 column vectors, such that,

$$AB_1 = \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix}, AB_2 = \begin{pmatrix} 2 \\ 3 \\ 0 \end{pmatrix}, AB_3 = \begin{pmatrix} 2 \\ 3 \\ 1 \end{pmatrix}$$

Let B be the 3×3 matrix whose 3 columns are B_1, B_2 and B_3 respectively. Then the determinant $det(B)$ equals

[Question ID = 2126]

1. $-\frac{3}{2}$ [Option ID = 8503]
2. $\frac{3}{2}$ [Option ID = 8504]
3. -3 [Option ID = 8501]
4. 3 [Option ID = 8502]

Correct Answer :-

- -3 [Option ID = 8501]

46)

Consider **Scenario 2 (this scenario appears in multiple questions):**

Trader 1 is endowed with 100 identical Left shoes. Trader 2 is endowed with 99 identical Right shoes. Each trader's utility from her allocation of shoes is equal to the number of complete pairs of shoes in the allocation. Traders 1 and 2 trade shoes in competitive markets and arrive at a competitive equilibrium. Assume that shoes are infinitely divisible.

Question: Given their endowments, an efficient allocation

[Question ID = 2113]

1. must give trader 1 at least 50 Left shoes [Option ID = 8449]
2. must give trader 1 at least 99 Left shoes [Option ID = 8451]

3. none of the above [Option ID = 8452]
4. must give trader 1 at least 50 Right shoes [Option ID = 8450]

Correct Answer :-

- must give trader 1 at least 50 Left shoes [Option ID = 8449]

47) Functions f, g from $\Re$ to $\Re$ are defined by:

$$f(x) = \begin{cases} 0, & \text{if } x \text{ is rational} \\ x, & \text{if } x \text{ is irrational} \end{cases}$$

$$g(x) = \begin{cases} 0, & \text{if } x \text{ is irrational} \\ x, & \text{if } x \text{ is rational} \end{cases}$$

Then the function $(f - g)(x)$ is

[Question ID = 2120]

1. injective but not surjective. [Option ID = 8477]
2. bijective. [Option ID = 8480]
3. surjective but not injective. [Option ID = 8478]
4. neither injective nor surjective. [Option ID = 8479]

Correct Answer :-

- injective but not surjective. [Option ID = 8477]

48)
Under a floating exchange rate regime, following an expansion in the money supply, monetary authorities will:

[Question ID = 2140]

1. Buy foreign currency in the foreign exchange market. [Option ID = 8557]
2. Do nothing in the foreign exchange market. [Option ID = 8559]
3. Buy domestic currency in the foreign exchange market. [Option ID = 8558]
4. Sell domestic currency in the foreign exchange market. [Option ID = 8560]

Correct Answer :-

- Buy foreign currency in the foreign exchange market. [Option ID = 8557]

49) In the 2-factor, 2-good Heckscher-Ohlin model, the two countries differ in

[Question ID = 2118]

1. tastes [Option ID = 8472]
2. labour productivities [Option ID = 8470]
3. technologies [Option ID = 8469]
4. relative availabilities of factors of production [Option ID = 8471]

Correct Answer :-

- technologies [Option ID = 8469]

50)

Consider a simple hypothesis test, testing: $H_0 : \mu = 170$ versus $H_A : \mu = 175$. Denote the probability of type I error by α and of type II error by β. Which of the following statements about the power of this test (defined as one minus the probability of type II error) are true? It depends on

(i) The sample size

(ii) The magnitude of α

(iii) The "true" value of μ.

The best answer is:

[Question ID = 2105]

1. (i) and (iii) [Option ID = 8418]
2. (i), (ii) and (iii) [Option ID = 8420]
3. (i) and (ii) [Option ID = 8417]
4. (ii) and (iii) [Option ID = 8419]

Correct Answer :-

- (i) and (ii) [Option ID = 8417]