DU MA Economics

Topic:- DU_J19_MA_ECO

1) 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 = 2922]

1. $[\frac{1}{3}, \frac{8}{3}]$ [Option ID = 11688]
2. [Option ID = 11685]
3. $[1, \frac{7}{3}]$ [Option ID = 11687]
4. $[1, \frac{4}{3}]$ [Option ID = 11686]

2)

Scenario 3 (this scenario appears in multiple questions):

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

$\hat{P} =$	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)

$R^2 = 0.72$; $SER = 41.5$, 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 = 2951]

1. [Option ID = 11801]

2. Rs. 39,450 [Option ID = 11802]

3. Rs. 39,000 [Option ID = 11804]

4. Rs. 37,200 [Option ID = 11803]

3)

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 = 2929]

1. $x = 2$ [Option ID = 11715]

2. $x = 5/2$ [Option ID = 11716]

3. [Option ID = 11713]

4. $x = 1/3$ [Option ID = 11714]

4) 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 = 2946]

1. 0.05 [Option ID = 11784]

2. [Option ID = 11781]

3. 0.25 [Option ID = 11783]

4. 0.025 [Option ID = 11782]

5)

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 = 2907]

1. None of the above hold necessarily. [Option ID = 11628]
2. $h_1(p_x, p_y, U) = h_2(p_x, p_y, U)$ [Option ID = 11627]
3. [Option ID = 11625]
4. $h_1(p_x, p_y, U) \supset h_2(p_x, p_y, U)$ [Option ID = 11626]

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

[Question ID = 2924]

1. $(1,3)$ [Option ID = 11696]
2. $(2,-3)$ [Option ID = 11693]
3. $(1,2)$ [Option ID = 11695]
4. $(2,3)$ [Option ID = 11694]

7) The efficiency wage theory argues that

[Question ID = 2937]

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 = 11747]

2.
[Option ID = 11745]

3. 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 = 11746]

4. 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 = 11748]

•

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

[Question ID = 2913]

1. All firms can take advantage of cheap labor. [Option ID = 11650]

2. [Option ID = 11649]

3. Output per worker in each firm increases. [Option ID = 11651]

4. World output can rise when each country specializes in what its does relatively best.
[Option ID = 11652]

9)

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

[Question ID = 2915]

1. tastes [Option ID = 11660]
2. relative availabilities of factors of production [Option ID = 11659]
3. labour productivities [Option ID = 11658]
4. [Option ID = 11657]

10)

The line $y = 2x + 5$ is tangent to a circle with equation $x^2 + y^2 + 16x + 12y + c = 0$, at point P. So, P equals

[Question ID = 2923]

1. $(-6, -7)$ [Option ID = 11691]
2. [Option ID = 11689]
3. $(-11, -15)$ [Option ID = 11692]
4. $(-10, -12)$ [Option ID = 11690]

11)

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 = 2949]

1. approximates a Normal distribution with mean p [Option ID = 11795]
2. [Option ID = 11793]
3. None of the above [Option ID = 11796]
4. has a Normal distribution with mean p [Option ID = 11794]

12)

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 = 2910]

1. must give trader 1 at least 99 Left shoes [Option ID = 11639]
2. must give trader 1 at least 50 Right shoes [Option ID = 11638]
3. none of the above [Option ID = 11640]
4. [Option ID = 11637]

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?

[Question ID = 2943]

1. [Option ID = 11769]
2. $\frac{2}{3}$ [Option ID = 11772]
3. $\frac{1}{3}$ [Option ID = 11770]
4. $\frac{3}{4}$ [Option ID = 11771]

14)

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 = 2918]

1. $f(x) = \sin x$ [Option ID = 11672]
2. $f(x) = (\sin x)/2 + (\cos x)/2$ [Option ID = 11670]
3. [Option ID = 11669]
4. $f(x) = \cos x$ [Option ID = 11671]

15)

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 = 2909]

1. at most 50 Right shoes [Option ID = 11636]
2. at least 99 Left shoes [Option ID = 11634]
3. [Option ID = 11633]
4. at most 99 Left shoes [Option ID = 11635]

16)

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 setting for the Solow Model with constant population). Then, the savings rate s that maximizes the steady state rate of consumption equals

[Question ID = 2932]

1. $1/2$ [Option ID = 11726]

2. [Option ID = 11725]

None of the above.

3. [Option ID = 11728]

$1/(1+\delta)$

4. [Option ID = 11727]

17)

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 = 2920]

1. [Option ID = 11677]

quasi-convex

2. [Option ID = 11679]

convex

3. [Option ID = 11678]

concave

4. [Option ID = 11680]

18)

Given nonempty subsets of $\Re^2$, say $Y_1, \ldots, Y_n$, let $Y^* = \{\sum_{j=1}^n y_j \mid y_1 \in Y_1, \ldots, y_n \in Y_n\}$. Given $p \in \Re^2$ and a nonempty set $Y \subset \Re^2$, let $V(p, Y) = \sup\{p.y \mid y \in Y\}$. Then, for every p,

[Question ID = 2921]

1. $v(p, Y^*) \geq \sum_{j=1}^n v(p, Y_j)$ [Option ID = 11684]

2. $v(p, Y^*) = \sum_{j=1}^n v(p, Y_j)$ [Option ID = 11682]

3. $v(p, Y^*) \leq \sum_{j=1}^n v(p, Y_j)$ [Option ID = 11683]

4. $v(p, Y^*) < \sum_{j=1}^n v(p, Y_j)$ or $v(p, Y^*) \geq \sum_{j=1}^n v(p, Y_j)$ [Option ID = 11681]

19)

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

[Question ID = 2939]

1. [Option ID = 11753]

2. A fall in both budget and current account deficits [Option ID = 11756]

3. A fall in budget deficit and a rise in current account deficit [Option ID = 11754]

4. A rise in both budget and current account deficits [Option ID = 11755]

20) 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 = 2925]

1. $\begin{pmatrix} 1 & 0 \\ 144 & 1 \end{pmatrix}$ [Option ID = 11699]

2. $\begin{pmatrix} 1 & 144 \\ 0 & 1 \end{pmatrix}$ [Option ID = 11698]

3. $\begin{pmatrix} 2+\sqrt{3} & 1 \\ -1 & 2-\sqrt{3} \end{pmatrix}$ [Option ID = 11700]

4. [Option ID = 11697]

21)

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 = 2912]

1. on all three of the above [Option ID = 11648]
2. only on the price of stamps [Option ID = 11646]
3. [Option ID = 11645]
4. only on his income [Option ID = 11647]

22)

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 = 2933]

1. None of the above is necessarily true. [Option ID = 11732]
2. $c_1 \leq c_2$ [Option ID = 11730]
3. [Option ID = 11729]
4. $c_1 = c_2$ [Option ID = 11731]

23)

Consider the following set of 2 equations:

$(2x)^{\ln 2} = (3y)^{\ln 3}$

$3^{\ln x} = 2^{\ln y}$

Suppose a pair (x, y) of numbers is a solution to this set of equations. Then x equals

[Question ID = 2930]

1. $1/3$ [Option ID = 11719]
2. $1/6$ [Option ID = 11720]
3. $1/2$ [Option ID = 11718]
4. [Option ID = 11717]

24)

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 = 2934]

1. Ambiguous [Option ID = 11736]
2. Zero [Option ID = 11735]
3. [Option ID = 11733]
4. Negative [Option ID = 11734]

25)

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 = 2911]

1. $1/3$ [Option ID = 11643]

2. $2/3$ [Option ID = 11644]

3. [Option ID = 11641]

4. 2 [Option ID = 11642]

26) Let

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

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

[Question ID = 2927]

1. [Option ID = 11705]

2. $I + A$ [Option ID = 11707]

3. A [Option ID = 11708]

4. A^{-1} [Option ID = 11706]

27)

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

[Question ID = 2954]

1. Both coefficients are significant. [Option ID = 11815]
2. [Option ID = 11813]
3. Neither coefficient is significant. [Option ID = 11816]
4. The coefficient of PC is significant, but that of BA is not [Option ID = 11814]

28)

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 = 2938]

1. [Option ID = 11749]
2. Net capital inflow is zero. [Option ID = 11751]
3. The investment demand will fall. [Option ID = 11752]
4. There will be net capital outflow. [Option ID = 11750]

29)

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 = 2917]

1. surjective but not injective. [Option ID = 11666]
2. [Option ID = 11665]
3. bijective. [Option ID = 11668]
4. neither injective nor surjective. [Option ID = 11667]

30)

Let $\|.\|_n$ and $\|.\|_m$ be norms on $\Re^n$ and $\Re^m$ respectively. Let $\mathcal{L}$ be the space of linear transformations from $\Re^n$ to $\Re^m$. Then,

[Question ID = 2919]

1. Neither $\|.\|_*$, nor $\|.\|_{**}$, is a norm on $\mathcal{L}$ [Option ID = 11676]
2. $\|.\|_*$ and $\|.\|_{**}$ are norms on $\mathcal{L}$ [Option ID = 11675]
3. [Option ID = 11673]
4. $\|L\|_{**} = \sup\{\|L(x)\|_m \mid x \in \Re^n \text{ and } \|x\|_n \leq 1\}$ defines a norm on $\mathcal{L}$ [Option ID = 11674]

31)

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 = 2908]

1. slightly less than 1 [Option ID = 11630]
2. slightly more than 1 [Option ID = 11631]
3. [Option ID = 11629]
4. 0 [Option ID = 11632]

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32)

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

[Question ID = 2952]

1. [Option ID = 11805]

2. Rs. 35,600 [Option ID = 11807]

3. Rs. 36,000 [Option ID = 11806]

4. Rs. 35,100 [Option ID = 11808]

33)

Suppose that the mark-up over cost is 20% for a representative firm in an economy with labour being the 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 = 2931]

1. 10% [Option ID = 11724]

2. [Option ID = 11721]

3. 13% [Option ID = 11723]

4. 17% [Option ID = 11722]

34)

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

[Question ID = 2947]

1. [Option ID = 11785]

2. strictly between 0 and 1 [Option ID = 11788]

3. 1 [Option ID = 11786]

4. either 0 or 1 [Option ID = 11787]

35)

Scenario 3 (this scenario appears in multiple questions):

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

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

$R^2 = 0.72$; $SER = 41.5$, 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 = 2950]

1. Rs. 23,915 [Option ID = 11800]
2. Rs. 21,800 [Option ID = 11799]
3. [Option ID = 11797]
4. Rs. 22,915 [Option ID = 11798]

36)

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 = 2936]

1. $M^D/P = Y/(0.5i)$ [Option ID = 11744]
2. $M^D/P = 0.5Y/i$ [Option ID = 11743]
3. $M^D/P = 2Y/i$ [Option ID = 11742]
4. $M^D/P = Y/i$ [Option ID = 11741]

37)

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: What is the adjusted coefficient of determination?

[Question ID = 2953]

1. 0.7052 [Option ID = 11812]
2. 0.7022 [Option ID = 11811]
3. [Option ID = 11809]
4. 0.7042 [Option ID = 11810]

38)

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 = 2926]

1. $\frac{3}{2}$ [Option ID = 11704]
2. $-\frac{3}{2}$ [Option ID = 11703]
3. 3 [Option ID = 11702]
4. [Option ID = 11701]

39)

Scenario 3 (this scenario appears in multiple questions):

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$\hat{P} =$	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)

$R^2 = 0.72$; $SER = 41.5$, 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 = 2955]

1. [Option ID = 11817]
0.900
2. [Option ID = 11818]
0.009
3. [Option ID = 11820]
9.000
4. [Option ID = 11819]

40)

A random number X, uniformly distributed on $[0, 1]$, divides $[0, 1]$ into 2 segments of lengths X and $(1 - X)$. Let R be the ratio of the smaller to the larger segment (i.e., $R = X/(1 - X)$, or $R = (1 - X)/X$, depending on whether $X \leq 1/2$ or $X > 1/2$. The distribution of R, $F(r)$, that is the probability that $R \leq r$ equals

[Question ID = 2945]

1. $1/(r + 1)$ [Option ID = 11779]
2. $2r/(r + 1)$ [Option ID = 11778]
3. $(1 - r)/(1 + r)$ [Option ID = 11780]
4. [Option ID = 11777]

41)

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

[Question ID = 2928]

1. $f''(x) = 3$, for some $x \in (2, 4)$. [Option ID = 11712]
2. $f''(x) = 4$, for some $x \in (2, 3)$. [Option ID = 11711]
3. $f''(x) = 3$, for some $x \in (2, 3)$. [Option ID = 11709]
4. $f''(x) = 2$, for some $x \in (2, 4)$. [Option ID = 11710]

42)

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 = 2940]

1. Rs. 15 billion. [Option ID = 11760]
2. Rs. 10 billion. [Option ID = 11758]
3. [Option ID = 11757]
4. Rs. 25 billion. [Option ID = 11759]

43)

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

[Question ID = 2941]

1. Buy domestic currency in the foreign exchange market. [Option ID = 11762]
2. Sell domestic currency in the foreign exchange market. [Option ID = 11764]
3. Do nothing in the foreign exchange market. [Option ID = 11763]
4. [Option ID = 11761]

44)

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 = 2944]

1. $X - Y$ and $X + Y$ are dependent random variables [Option ID = 11774]
2. X^2 and Y are independent random variables. [Option ID = 11773]

3. X^2 and Y^2 are independent random variables [Option ID = 11775]

4. All of the above [Option ID = 11776]

45)

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 = 2914]

1. 5 percent [Option ID = 11654]

2. [Option ID = 11653]

3. 12 percent [Option ID = 11656]

4. 8 percent [Option ID = 11655]

46)

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 = 2935]

1. None of the above. [Option ID = 11740]

2. $g_1 < g_2$ [Option ID = 11739]

3. $g_1 = g_2$ [Option ID = 11738]

4. [Option ID = 11737]

47)
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 = 2948]

1. 1 [Option ID = 11792]
2. $10/7$ [Option ID = 11790]
3. [Option ID = 11789]
4. $3/10$ [Option ID = 11791]

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

[Question ID = 2916]

1. $\cup_{n=1}^{\infty}[a_n, b_n]$, where each a_n and b_n is a real number [Option ID = 11662]
2. [Option ID = 11661]
3. $\cup_{n=1}^{\infty}[a_n, b_n]$, where each a_n and b_n is a rational number [Option ID = 11663]
4. all of the above [Option ID = 11664]

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

[Question ID = 2942]

1. $1 - (\frac{5}{6})^6$ [Option ID = 11767]
2. $\frac{5}{6}$ [Option ID = 11768]
3. $(\frac{5}{6})^6$ [Option ID = 11765]

$\frac{1}{6}$

4. [Option ID = 11766]

50)

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 = 2906]

1. $m_1(p_x, p_y, w) \subset m_2(p_x, p_y, w)$ and $v_1(p_x, p_y, w) \leq v_2(p_x, p_y, w)$ [Option ID = 11623]
2. $m_1(p_x, p_y, w) \supset m_2(p_x, p_y, w)$ and $v_1(p_x, p_y, w) \geq v_2(p_x, p_y, w)$ [Option ID = 11624]
3. [Option ID = 11621]
4. $m_1(p_x, p_y, w) \supset m_2(p_x, p_y, w)$ and $v_1(p_x, p_y, w) = v_2(p_x, p_y, w)$ [Option ID = 11622]