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Past Year Question Paper

GATE-2021 ECONOMICS



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GATE 2021

Q.1 – Q.20 Multiple Choice Question (MCQ), carry ONE mark each (for each wrong answer: – 1/3).

Question - 1	A firm finds that for the product that it produces, its (own) price elasticity of demand is 4. Currently, the firm is selling 2000 units per month at ₹ 5 per unit. If it wishes to increase its sales by 10%, it must
Option A	lower its price by 4%
Option B	lower its price by 2%
Option C	lower its price by 2.5%
Option D	increase its price by 2%

Question - 2	"Inflation increases the average level of prices". Which of the following is(are) necessarily implied by this statement: I. The prices of commodities exceed income II. Money supply grows at a higher rate than the real GDP
Option A	Only (i)
Option B	Only (ii)
Option C	Both (i) and (ii)
Option D	Neither (i) nor (ii)

Question - 3	For the production function $Q = F(K, L) = \sqrt{KL}$ with $PK = 4$ and $PL = 2$, find the values of K and L that will minimize the cost of producing 2 units of output.
Option A	$K = 2\sqrt{3}$; $L = 3\sqrt{2}$
Option B	$K = 2\sqrt{2}$; $L = \sqrt{2}$
Option C	$K = \sqrt{2}$; $L = 2\sqrt{2}$
Option D	$K = 2$; $L = 2$

Question - 4	If the sum of price elasticities of imports and exports of a country exceeds unity, then a depreciation of domestic currency will ultimately result in
Option A	contraction in trade deficit of the country
Option B	widening of trade deficit of the country
Option C	an uncertain net effect on the trade balance
Option D	a huge outflow of foreign portfolio capital from that country

Question - 5	<p>To determine the relationship between y and x_1, Rohit estimated two different OLS models. In the first model, Rohit regressed y on x_1 and x_2 as given below</p> $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u \dots (1)$ <p>In the second model, Rohit regressed y only on x_1 as given below</p> $y = \delta_0 + \delta_1 x_1 + v \dots (2)$ <p>The estimated coefficients of x_1 in the above two models are exactly the same. From this observation we can state conclusively that</p> <p>I. $Cov(x_1, y) = 0$</p>
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	II. $\hat{\beta}_2 = 0$ III. $Cov(x_2, x_1) = 0$ where $\hat{\beta}_2$ is the estimated coefficient of x_2 in the equation (1)
Option A	Only (i) is true
Option B	Only (ii) is true
Option C	Either (ii) or (iii) or both are true
Option D	Neither (ii) nor (iii) is true

Question - 6	XYZ Co. Ltd. is a costless monopoly from suburban Mumbai producing and selling exotic mushrooms. The demand for mushrooms is given by $Q = 700 - 100P$. Do you agree that XYZ will have a maximum possible total revenue of ₹1500?
Option A	Yes, the maximum possible total revenue is ₹1500
Option B	No, the maximum possible total revenue is less than ₹1500
Option C	No, the maximum possible total revenue is more than ₹1500
Option D	No, the maximum possible total revenue cannot be estimated

Question - 7	In a demand function estimation of a good X, a researcher collected data on various households' consumption of good X (Q_x) for various price levels. The researcher also collected data on household income (M) and household size (S). The estimated regression result is $\log Q_x = -0.345(0.111) - 1.543(2.345) \log P_x + 1.123(0.012) \log M + 0.234(0.123) \log S$ where P_x is the price per unit of X. The values in the parentheses are the standard errors of the estimated coefficients. From the estimation one can conclude that
Option A	the demand for good X is highly elastic
Option B	X is an inferior good
Option C	the estimated price elasticity of demand is not statistically significant
Option D	the estimated price elasticity of good X is 2.345

Question - 8	Consider a duopoly market in which the market demand function is as follows: $P = 40 - Q$. For the two firms producing with identical marginal costs of 10, the Bertrand-Nash equilibrium price will be:
Option A	40
Option B	10
Option C	20
Option D	30

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Question - 9	What would be the consequences for the OLS estimator if heteroscedasticity is present in a regression model but ignored? Assume that all the other classical assumptions are valid.
Option A	It will be biased
Option B	It will be inconsistent
Option C	It will be unbiased but inefficient
Option D	It will be unbiased but inconsistent

Question - 10	Walras' Law implies that if there are N markets in the economy, then one only needs to find equilibrium prices in
Option A	N – 2 markets
Option B	N – 1 markets
Option C	N + 1 markets
Option D	all the N markets

Question - 11	There are many reasons why a poor country may fail to catch up with a rich neighbor. Which of the following is NOT one of these reasons?
Option A	The poor country may have more rapid population growth
Option B	The rich country may have more human capital
Option C	The poor country may have a higher saving ratio
Option D	The rich country through trade may be more integrated with the world economy

Question - 12	In a two-country model, an increase in foreign country's national income generally, leads to:
Option A	increased exports and increased domestic output
Option B	decreased exports but increased domestic output
Option C	decreased exports and decreased domestic output
Option D	increased exports but decreased domestic output

Question - 13	<p>Piku faces a lottery with outcomes of ₹24, ₹12, ₹48 and ₹6 given by the following probability distribution</p> <table><tr><td>Lottery Outcome</td><td>Rs. 24</td><td>Rs. 12</td><td>Rs. 48</td><td>Rs. 6</td></tr><tr><td>Probability of Outcome</td><td>2/6</td><td>3/6</td><td>1/6</td><td>0</td></tr></table> <p>She is indifferent between the lottery and receiving ₹28 with certainty. Given the information we can conclude that Piku is a</p>	Lottery Outcome	Rs. 24	Rs. 12	Rs. 48	Rs. 6	Probability of Outcome	2/6	3/6	1/6	0
Lottery Outcome	Rs. 24	Rs. 12	Rs. 48	Rs. 6							
Probability of Outcome	2/6	3/6	1/6	0							
Option A	risk lover										
Option B	risk averse										
Option C	risk neutral										
Option D	hedger										

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Question - 14	<p>Consider a regression model $y = \beta_0 + \beta x + u$ where the continuous variable y is regressed on a dummy variable x, which takes the value either 1 or 0. However, the model was estimated using the instrumental variable (IV) estimation method, wherein the indicator variable z is used as an instrument of x. Let \bar{y}_1 and \bar{y}_0 be the sample averages of y when z takes the value 1 and 0, respectively \bar{x}_1 and \bar{x}_0 be the sample averages of x when z takes the value 1 and 0, respectively \bar{y}_1 and \bar{y}_0 be the sample averages of y when x takes the value 1 and 0, respectively \bar{z}_1 and \bar{z}_0 be the sample averages of z when x takes the value 1 and 0, respectively Then the estimated coefficient of β_{IV} is</p>
Option A	$\bar{y}_1 - \bar{y}_0 / \bar{z}_1 - \bar{z}_0$
Option B	$\bar{y}_1 - \bar{x}_1 / \bar{y}_0 - \bar{x}_0$
Option C	$\bar{y}_1 - \bar{y}_0 / \bar{x}_1 - \bar{x}_0$
Option D	$\bar{y}_1 - \bar{y}_0 / \bar{z}_1 - \bar{z}_0$

Question - 15	Assuming that external economies exist, when demand increases in a perfectly competitive market, in the long-run, the price of the product
Option A	risers above the initial price (before the demand increase) and quantity increases
Option B	remains the same as the initial price (before the demand increase) and quantity
Option C	falls below the initial price (before the demand increase) and quantity increases
Option D	equals the initial price (before the demand increase) and quantity decreases

Question - 16	Consider an individual who maximizes her expected utility having Bernoulli utility function $u(w) = \alpha - \beta e^{-rw}$; $w > 0$ is wealth. The individual display _____ relative risk aversion.
Option A	constant
Option B	increasing
Option C	decreasing
Option D	uncertain

Question - 17	For an open economy, the 'twin deficits' can be expressed by: [where S = Savings; I = Gross Private Investment; G = Government Expenditures; TR = Transfer Payments; TX = Taxes; X = Exports; M = Imports and NFIA = Net Factor Income from Abroad]
Option A	$S - I = [G - TR - TX] + [X - M]$
Option B	$I - S = [G + TX - TR] + [M - X]$
Option C	$S - I = [G + TR - TX] + [X - M]$
Option D	$I - S = [TX - G + TR] + [NFIA]$

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Question - 18	If expectations about inflation are formed as per the rational expectations hypothesis, then the short-run Philips curve will be
Option A	negatively sloped
Option B	parallel to the vertical axis
Option C	parallel to the horizontal axis
Option D	coinciding with the NAIRU

Question - 19	As economic development proceeds, income inequality tends to follow a(n) _____ curve.
Option A	asymptotically convex
Option B	inverted U-shaped
Option C	V-shaped
Option D	S-shaped

Question - 20	India has the highest amount of foreign debt in the form of
Option A	Non-Resident Indian (NRI) Deposits
Option B	Commercial Borrowings
Option C	Loans taken from the International Monetary Fund
Option D	Loans taken from the Bank of England

Q.21 – Q.25 Multiple Choice Question (MCQ), carry TWO marks each (for each wrong answer: – 2/3).

Question - 21	Let A and B be two events with probabilities $P(A) = 3/4$ and $P(B) = 1/3$ then which of the following options is true?
Option A	$P(A \cap B) \geq \max. \left[\frac{3}{4}, \frac{1}{3} \right]$
Option B	$\frac{1}{3} \geq P(A \cap B) \geq \frac{1}{12}$
Option C	$\frac{3}{4} \geq P(A \cap B) \geq \frac{1}{3}$
Option D	$P(A \cap B) \geq \min. \left[\frac{3}{4}, \frac{1}{3} \right]$

Question - 22	If $S^2 = \frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2$ is an unbiased and consistent estimator of the population variance, then one can conclude that $S = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2}$ is an _____ estimator of the population standard deviation.
Option A	Unbiased and consistent
Option B	Biased and consistent
Option C	Unbiased and inconsistent
Option D	Biased and inconsistent

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Question - 23	Consider the following demand–supply model, where Demand function: $P = Q^2 - 12Q + 35$ Supply function: $4P - 3Q = 0$ The stable market equilibrium price-quantity combination will be
Option A	$(P^*, Q^*) = (3, 4)$
Option B	$(P^*, Q^*) = (105/16, 70/8)$
Option C	$(P^*, Q^*) = (6, 8)$
Option D	$(P^*, Q^*) = (14, 3)$

Question - 24	Trisha's consumption preference on biryani (x) and pudding (y) is given by the utility function $U(x, y) = x + 4y$. The price per unit of biryani is ₹2 and the price per unit of pudding is ₹3. Trisha's total income is ₹120. However, she faces an extra quantity constraint as she is not allowed to consume biryani more than 60 units and pudding more than 30 units. The optimum quantity of biryani and pudding consumed by Trisha is
Option A	$(x^*, y^*) = (30, 20)$
Option B	$(x^*, y^*) = (15, 30)$
Option C	$(x^*, y^*) = (30, 15)$
Option D	$(x^*, y^*) = (60, 0)$

Question - 25	Consider a Cournot type n -firm natural spring oligopoly where the market demand for natural spring water is given by $P(Q) = a - Q, a > 0$. The n firms are symmetric. Each firm incurs a bottling cost of $C_i = cq_i, c > 0$ and $a > c$. The equilibrium market price will be
Option A	$(n+1)/a + n(n+1)/c$
Option B	$a/(n+1) + nc/(n+1)$
Option C	$na/(n+1) + nc/(n+1)$
Option D	$(a-c)/n+1 + c/n(n+1)$

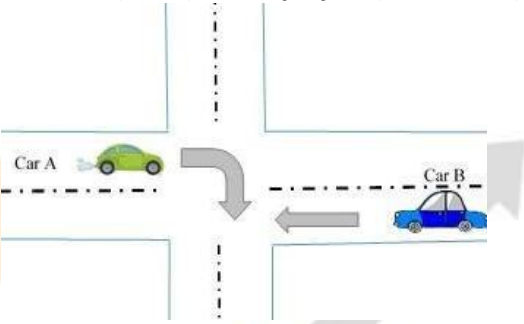
Q.26 – Q.30 Multiple Select Question (MSQ), carry TWO mark each (no negative marks).

Question - 26	Goods and Services Tax (GST) is
Option A	a 'destination based' consumption tax
Option B	an origin-based tax assigned to the State of origin where the sale takes place
Option C	an indirect tax
Option D	a modified form of value added tax

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Question - 27	<p>Consider an intersection of roads without any traffic light. Two cars A and B approach an intersection and they want to proceed as indicated by respective arrows in the following diagram. If both proceed without stopping and there is an accident, then A would have a payoff of -100 and B would have a payoff of -500 (since B is responsible for the accident). If one stops, and the other proceeds then the payoff is: -5 and 10, respectively. If both of them stop, then it takes a little longer to reach their respective destinations, they have a payoff of -5 each. Find the Pure Strategy Nash Equilibrium (PSNE) of the players (Car drivers).</p> 
Option A	(Car A, Car B) = (Stop, Stop)
Option B	(Car A, Car B) = (Stop, Proceed)
Option C	(Car A, Car B) = (Proceed, Stop)
Option D	(Car A, Car B) = (Proceed, Proceed)

Question - 28	A Government Security (G-Sec)
Option A	is a tradeable instrument issued by the Central Government
Option B	is a tradeable instrument issued by State Governments
Option C	can have maturity of only more than one year
Option D	cannot be considered as 'gilt-edged' instrument

Question - 29	If a country has flexible exchange rate regime with perfect capital mobility, then according to the Mundell-Fleming Model, an expansionary fiscal policy will lead to
Option A	no change in output
Option B	reduced net exports
Option C	appreciation of nominal exchange rate
Option D	expansion of output

Question - 30	The basic tenets of 'Monetarism' are
Option A	acceptance of the 'quantity theory' approach to macroeconomic analysis
Option B	a strict rule based monetary policy
Option C	a monetary approach to the balance-of-payments and exchange-rate theory
Option D	an active stabilization policy through expansionary monetary/fiscal policies

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Q.31 – Q.40 Numerical Answer Type (NAT), carry TWO mark each (no negative marks).

Question - 31

Two farmers, Rohit and Harish, graze their animals on a common land. They can choose to use this common resource 'lightly' or 'heavily' and the resulting strategic interaction may be described as a simultaneous-move game. The payoff matrix is given below:

		Harish	
		Graze Lightly	Graze Heavily
Rohit	Graze Lightly	40,40	20,55
	Graze Heavily	55,20	30,30

The minimum value of the discount rate (where the discount rate is less than one) under infinite repetition of the game where the threat strategy ("Graze lightly if the opponent also grazes lightly, whereas, if the opponent renege, then always graze heavily in all the future periods"), is a Sub-game Perfect Nash Equilibrium (SPNE) and, both the farmers graze their animals lightly is (round off to one decimal place).

Question - 32	<p>Suppose Vijay has purchased a high-speed car worth ₹1000000. During the purchase, an insurance company has shared the latest available road safety survey, wherein it is mentioned that, due to heavy congestion on roads, there is 40% chance of an accident within the first year of car purchase resulting in loss of the car value by 60%. Vijay's utility function for wealth (W) is given by $U(W) = \ln(W)$. If Vijay plans to buy an accident insurance having a premium of 30%, then he will purchase an insurance of ₹_____ (round off to the nearest integer).</p>
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Question - 33	<p>Consider the following table: All values are in Rupees Thousand Crore) (Based on the given data, the average Broad Money Multiplier for the period April - June is (round off to three decimal places).</p>							
	Month	Currency in Circulation	Cash with Banks	Currency with the Public	Other Deposits with the RBI	Bankers' Deposits with the RBI	Demand Deposits	Time Deposits
	April	2523	98	2425	40	457	1582	12988
	May	2611	98	2513	42	468	1565	13112
	June	2661	94	2567	39	484	1573	13141

Question - 34	<p>Consider two regression models estimated on a sample of 350 observations.</p> $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + u \dots (1)$ $y = \alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + v \dots (2)$ <p>The R^2 in model (1) is $R^2_1 = 0.3521$ and in model (2) is $R^2_2 = 0.2314$. The value of the test statistic to test the $H_0: \beta_3 = \beta_4 = \beta_5 = 0$ is (round off to three decimal places).</p>
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Question - 35	Consider a competitive market where the demand and supply functions are given by $q^D = 12 - 2P$ and $q^S = 4P$, respectively. The tax rate per unit of output that maximizes the tax yield (revenue) is _____ (in integer).																			
Question - 36	Suppose the demand for a new pharmaceutical drug, on which the manufacturer has a patent monopoly, is given by: $Q = (100 - P)A^{0.5}$; where Q is output, P is the price and A is advertising expenditure. Production cost of the patented drug is given by: $C(Q) = 60Q$. At the firm's optimal choices, the ratio of advertising expenditure to sales revenue for the pharmaceutical product will be 1: _____ (in integer).																			
Question - 37	Let the rate of inflation in an economy be 4.2%, the growth rate of velocity of money be 2% and, the growth rate of real GDP be 6%. According to Milton Friedman's 'k' percent rule, the rate of growth of money supply for maintaining stable prices will be _____ (round off to one decimal place).																			
Question - 38	The long-run cost function of all identical firms in a perfectly competitive industry is given by: $C = 25q - 3q^2 + 1.5q^3$ The market demand function is: $P = 2500 - 0.25Q$ The number of firms in the industry at equilibrium is _____ (in integer).																			
Question - 39	<p>Given below is an inter-industry transactions matrix. If final demand for the agriculture sector changes from 150 units to 300 units and for the manufacturing sector changes from 120 units to 200 units, then the output of the agriculture sector should be _____ units (in integer).</p> <table><tr><th colspan="2" rowspan="2"></th><th colspan="2">User</th><th rowspan="2">Final Demand</th><th rowspan="2">Total Output`</th></tr><tr><th>Agriculture</th><th>Manufacturing</th></tr><tr><td rowspan="2">Producer</td><td>Agriculture</td><td>500</td><td>350</td><td>150</td><td>1000</td></tr><tr><td>Manufacturing</td><td>320</td><td>360</td><td>120</td><td>800</td></tr></table>			User		Final Demand	Total Output`	Agriculture	Manufacturing	Producer	Agriculture	500	350	150	1000	Manufacturing	320	360	120	800
				User				Final Demand	Total Output`											
		Agriculture	Manufacturing																	
Producer	Agriculture	500	350	150	1000															
	Manufacturing	320	360	120	800															
Question - 40	Consider that a sample of size 3 is randomly drawn from a population that takes only two values, equally likely: - 1 and 1. Let $z = \max(x_1, x_2, x_3)$ where x_1, x_2, x_3 are the sample observations. The expected value of z, E(z) is _____ (round off to two decimal places).																			



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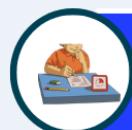
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