



General Aptitude (GA)

Q.1 – Q.5 Multiple Choice Question (MCQ), carry ONE mark each (for each wrong answer: – 1/3).

Q.1	Consider the following sentences: (i) After his surgery, Raja hardly could walk. (ii) After his surgery, Raja could barely walk. (iii) After his surgery, Raja barely could walk. (iv) After his surgery, Raja could hardly walk. Which of the above sentences are grammatically CORRECT?
(A)	(i) and (ii)
(B)	(i) and (iii)
(C)	(iii) and (iv)
(D)	(ii) and (iv)

Q.2	Ms. X came out of a building through its front door to find her shadow due to the morning sun falling to her right side with the building to her back. From this, it can be inferred that building is facing _____
(A)	North
(B)	East
(C)	West
(D)	South



Q.3	In the above figure, O is the center of the circle and, M and N lie on the circle. The area of the right triangle MON is 50 cm^2. What is the area of the circle in cm^2 ?
(A)	2π
(B)	50π
(C)	75π
(D)	100π

Q.4	If $\begin{cases} \text{"}\oplus\text{" means "}-\text{"}, \\ \text{"}\otimes\text{" means "}\div\text{"}, \\ \text{"}\Delta\text{" means "}\text{+}\text{"}, \\ \text{"}\nabla\text{" means "}\times\text{"}, \end{cases}$ then, the value of the expression $\Delta 2 \oplus 3 \Delta ((4 \otimes 2) \nabla 4) =$
(A)	-1
(B)	-0.5
(C)	6
(D)	7



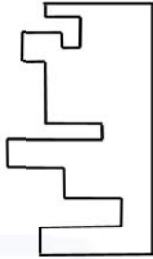
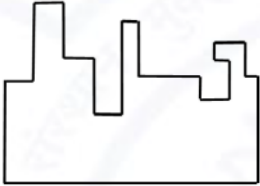
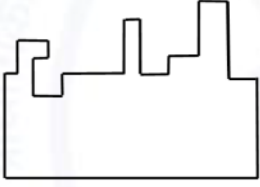
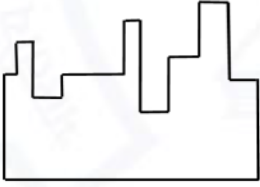
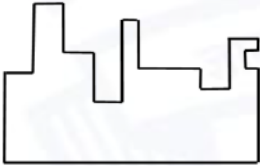
Q.5	“The increased consumption of leafy vegetables in the recent months is a clear indication that the people in the state have begun to lead a healthy lifestyle” Which of the following can be logically inferred from the information presented in the above statement?
(A)	The people in the state did not consume leafy vegetables earlier.
(B)	Consumption of leafy vegetables may not be the only indicator of healthy lifestyle.
(C)	Leading a healthy lifestyle is related to a diet with leafy vegetables.
(D)	The people in the state have increased awareness of health hazards causing by consumption of junk foods.



Q. 6 – Q. 10 Multiple Choice Question (MCQ), carry TWO marks each (for each wrong answer: – 2/3).

Q.6	Oxpeckers and rhinos manifest a symbiotic relationship in the wild. The oxpeckers warn the rhinos about approaching poachers, thus possibly saving the lives of the rhinos. Oxpeckers also feed on the parasitic ticks found on rhinos. In the symbiotic relationship described above, the primary benefits for oxpeckers and rhinos respectively are,
(A)	Oxpeckers get a food source, rhinos have no benefit.
(B)	Oxpeckers save their habitat from poachers while the rhinos have no benefit.
(C)	Oxpeckers get a food source, rhinos may be saved from the poachers.
(D)	Oxpeckers save the lives of poachers, rhinos save their own lives.



Q.7	 A jigsaw puzzle has 2 pieces. One of the pieces is shown above. Which one of the given options for the missing piece when assembled will form a rectangle? The piece can be moved, rotated or flipped to assemble with the above piece.
(A)	
(B)	
(C)	
(D)	



Q.8	The number of hens, ducks and goats in farm P are 65, 91 and 169, respectively. The total number of hens, ducks and goats in a nearby farm Q is 416. The ratio of hens:ducks:goats in farm Q is 5:14:13. All the hens, ducks and goats are sent from farm Q to farm P. The new ratio of hens:ducks:goats in farm P is _____
(A)	5:7:13
(B)	5:14:13
(C)	10:21:26
(D)	21:10:26

Q.9	<table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Company</th><th>Ratio</th></tr> </thead> <tbody> <tr> <td>C1</td><td>3:2</td></tr> <tr> <td>C2</td><td>1:4</td></tr> <tr> <td>C3</td><td>5:3</td></tr> <tr> <td>C4</td><td>2:3</td></tr> <tr> <td>C5</td><td>9:1</td></tr> <tr> <td>C6</td><td>3:4</td></tr> </tbody> </table> The distribution of employees at the rank of executives, across different companies C1, C2, ..., C6 is presented in the chart given above. The ratio of executives with a management degree to those without a management degree in each of these companies is provided in the table above. The total number of executives across all companies is 10,000. The total number of management degree holders among the executives in companies C2 and C5 together is _____.	Company	Ratio	C1	3:2	C2	1:4	C3	5:3	C4	2:3	C5	9:1	C6	3:4
Company	Ratio														
C1	3:2														
C2	1:4														
C3	5:3														
C4	2:3														
C5	9:1														
C6	3:4														
(A)	225														
(B)	600														
(C)	1900														
(D)	2500														



Q. 10	Five persons P, Q, R, S and T are sitting in a row not necessarily in the same order. Q and R are separated by one person, and S should not be seated adjacent to Q. The number of distinct seating arrangements possible is:
(A)	4
(B)	8
(C)	10
(D)	16



Reasoning and Comprehension (XH-B1)

Q.1 – Q.5 Multiple Choice Question (MCQ), carry ONE mark each (for each wrong answer: – 1/3).

Q.1	According to a recent article in a medical journal, consuming curcumin (from turmeric) significantly lowers the risk of COVID-19. The researchers draw this conclusion from a study that found that people who consumed one or more teaspoons of curcumin extract everyday were half as likely to be diagnosed with the disease as people who did not consume curcumin. Which of the following, if true, most weakens the argument in the article?
(A)	In another study, people who were given a zinc supplement everyday were more than four times less likely to be diagnosed with COVID-19 as those who did not.
(B)	All the participants in this study were from the same state where no other spices or herbs are consumed.
(C)	The participants who consumed curcumin were also more likely to exercise than those who did not.
(D)	In another study, COVID-19 patients who were given curcumin were no more likely to recover than others.

Q.2	Froot Inc. carried out an internet advertisement campaign for its new beverage CocoLoco. After the campaign, the director of the advertising company conducted a survey and found that the CocoLoco sales were higher than that of TenderJoos a competing product from Joos Inc. The agency concluded that the internet advertising campaign is more effective than advertising through other media. Which of the following statements could strengthen the conclusion above by the agency?
(A)	A ₹2 discount was offered on CocoLoco during the campaign period.
(B)	CocoLoco sales were higher than those of TenderJoos before the internet campaign.
(C)	A newspaper advertisement campaign the previous year did not increase CocoLoco sales.
(D)	During the campaign for CocoLoco, Joos Inc. did not advertise TenderJoos at all.



Q.3	An e-commerce site offered a deal last month conditional on the customer spending a minimum of ₹500. Any customer who buys 2 kg of fresh fruit will receive a hand mixer and any customer who buys 2 kg of fresh vegetables will receive a vegetable chopper. Which of the following is NOT a possible outcome of the above?
(A)	A customer purchased 3 kg of fresh fruit and did not receive a vegetable chopper.
(B)	A customer purchased items for ₹500 which included 1 kg of vegetables and received a hand mixer.
(C)	A customer purchased items for ₹500 which included 2 kg of vegetables and 1 kg of fruit and received a hand mixer.
(D)	A customer purchased items for ₹300 which included 2 kg of fruit and received neither a hand mixer nor a vegetable chopper.

Q.4	Writers of detective fiction often include an incompetent detective as a foil for the brilliant investigator-protagonist as they follow different paths in trying to solve the crime. In the individual accounts, the incompetent detective is frequently distracted by the culprit's careful plans, while the competent investigator solves the case after a final confrontation. Analysts of such fiction believe that the authors select this story-telling technique to provide readers with more complexities in the form of misleading clues, while figuring out the crime. Which of the following statements most logically follows from the passage above?
(A)	A detective story is considered well-written if the brilliant investigator is accompanied by an incompetent detective.
(B)	Writers of detective fiction use the contrast of an incompetent detective to mainly show how complex the investigation is.
(C)	Writers of detective fiction never write stories where the incompetent detective solves the case.
(D)	Writers of detective fiction use two investigative accounts to make it difficult for the reader to figure out the outcome.



Q.5	The first (P1) and the last (P6) parts of a single sentence are given to you. The rest of the sentence is divided into four parts and labelled (L,M,N,O). Reorder these parts so that the sentence can be read through correctly and select one of the options given. <i>P1: Studies of several Sahitya Akademi award winners show that...</i> L: or encounter professional M: and invariably develop a strained relationship with other literary figures N: they often publish very little O: after winning the prize <i>P6: ...envy and rivalry.</i> The correct order is:
(A)	NOLM
(B)	MLON
(C)	ONML
(D)	MOLN



Q.6 – Q.10 Multiple Choice Question (MCQ), carry TWO mark each (for each wrong answer: – 2/3).

Q. 6	Gerrymandering refers to the targeted redrawing of election constituencies so as to benefit a particular party. This is especially important where the electoral system is “first past the post” in each constituency (i.e. one winner is selected in each constituency based on a majority of votes won) and where there is no other provision for proportional representation (as for example in the German system). For a simple illustration of gerrymandering, if a region consists of districts 1, 2, 3, ..., 9 with districts 1, 2, 3, 4, 5, 6 favouring party P and 7, 8, 9 favouring party Q, then grouping of districts to constituencies as {1,2,3}, {4,5,6}, {7,8,9} will give two seats to party P and one seat to party Q, whereas the grouping {1,2,7}, {3,4,8}, {5,6,9} will give all three seats to party P, as they will secure a majority in each constituency. Which of these statements can be deduced from the above?
(A)	Gerrymandering implies that constituency boundaries can sometimes be drawn to favour one party over the other.
(B)	Gerrymandering implies that proportional representation is impossible when districts are grouped to form constituencies.
(C)	To counteract gerrymandering political parties should concentrate on districts where they are favoured.
(D)	The grouping of districts to constituencies has very little impact on proportional representation.



Q. 7	X-ray examination of a recently discovered painting that some authorities judge to be a self-portrait by Michelangelo revealed an under-image of a woman's face. Either Michelangelo or some other artist must have repainted over the first painting that had now been seen on the canvas. Because the woman's face also appears on other paintings by Michelangelo, this painting is determined to indeed be an authentic painting by Michelangelo. Which of the following assumptions must be made in reaching the conclusion above?
(A)	When an already painted canvas of an artist is used, the second artist using that canvas for a new painting is usually influenced by the artistic style of the first.
(B)	Several painted canvases that art historians attribute to Michelangelo contain under-images that appear on at least one other of Michelangelo's paintings.
(C)	Subject or subjects that appear in authenticated paintings of Michelangelo are rather unlikely to show up as under-images on painted canvases not attributed to Michelangelo.
(D)	No painted canvas can be attributed to a particular artist with certainty without an X-ray analysis.

Q. 8	This season _____ tourists visited Ladakh than last season; however, _____ to be the biggest tourist destination in India. The tourism department explains that the number of tourists to India has _____ relative to previous years, _____ have chosen to visit Ladakh. Select the correct sequence of phrases to fill in the blanks to complete the passage above.
(A)	more / for the first time in many seasons it does not appear / increased / and it seems that most
(B)	fewer / as in the past, it appears / in fact decreased / but it seems that only a small proportion
(C)	fewer / for the first time in many seasons it appears / in fact decreased / but it seems that most
(D)	more / this season as well, it appears / in fact decreased / but it seems that a large proportion



Q. 9	Reorder the sentences in (1) – (5) such that they form a coherent paragraph. (1) In fact, dozens of languages today have only one native speaker still living, and that person's death will mean the extinction of the language: It will no longer be spoken, or known, by anyone on earth. (2) Many languages are falling out of use and are being replaced by others that are more widely used in the region or nation, such as English in Australia or Portuguese in Brazil. (3) Many other languages are no longer being learned by new generations of children or by new adult speakers. (4) An endangered language is one that is likely to become extinct in the near future. (5) Unless the trends are reversed, these endangered languages will become extinct by the end of the century. (Adapted from <i>What is an Endangered Language</i> by A. Woodbury.)
(A)	2 3 1 4 5
(B)	2 3 5 4 1
(C)	4 1 5 2 3
(D)	4 2 3 1 5



Q. 10	The first (P1) and the last (P6) parts of a single sentence are given to you. The rest of the sentence is divided into four parts and labelled L,M,N,O. Reorder these parts so that the sentence can be read correctly and select one of the sequences below. <i>P1: For a little while...</i> L: it was a common belief M: right after the treaty of Versailles N: that Germany had caused World War I not just by her actions O: held by analysts and politicians alike <i>P6: ... but by also encouraging Italy in her own aggressions.</i>
(A)	LMNO
(B)	MLON
(C)	LNMO
(D)	MOLN



Q.11 – Q.15 Multiple Select Question (MSQ), carry TWO mark each (no negative marks).

Q. 11	After Florentino Ariza saw her for the first time, his mother knew before he told her because he lost his voice and his appetite and spent the entire night tossing and turning in his bed. But when he began to wait for the answer to his first letter, his anguish was complicated by diarrhoea and green vomit, he became disoriented and suffered from sudden fainting spells, and his mother was terrified because his condition did not resemble the turmoil of love so much as the devastation of cholera. Florentino Ariza's godfather, an old homeopathic practitioner who had been Tránsito Ariza's confidant ever since her days as a secret mistress, was also alarmed at first by the patient's condition, because he had the weak pulse, the hoarse breathing, and the pale perspiration of a dying man. But his examination revealed that he had no fever, no pain anywhere, and that his only concrete feeling was an urgent desire to die. All that was needed was shrewd questioning, first of the patient and then of his mother, to conclude once again that the symptoms of love were the same as those of cholera. He prescribed infusions of linden blossoms to calm the nerves and suggested a change of air so he could find consolation in distance, but Florentino Ariza longed for just the opposite: to enjoy his martyrdom. (Adapted from <i>Love in a Time of Cholera</i> by Gabriel García Márquez.) The author of the passage is implying that:
(A)	Homeopathy cures love.
(B)	The doctor could not distinguish between love and cholera.
(C)	The doctor could distinguish between love and cholera.
(D)	The symptoms of love and cholera are similar.



Q. 12	Now, it is clear that the decline of a language must ultimately have political and economic causes: it is not due simply to the bad influence of this or that individual writer. But an effect can become a cause, reinforcing the original cause and producing the same effect in an intensified form, and so on indefinitely. A man may take to drink because he feels himself to be a failure, and then fail all the more completely because he drinks. It is rather the same thing that is happening to the English language. It becomes ugly and inaccurate because our thoughts are foolish, but the slovenliness of our language makes it easier for us to have foolish thoughts. (Adapted from <i>Politics and the English Language</i> by George Orwell.) The illustration of the man who takes to drink is used to underscore which of the following ideas in the passage above?
(A)	Political and economic causes control deterioration of language.
(B)	Foolish thoughts are enabled by inaccurate language.
(C)	Effect of an action becomes the cause in a cyclic pattern.
(D)	Drinking enables people to have foolish thoughts and slovenly language.



Q. 13	It is a pity that Caste even today has its defenders. The defences are many. It is defended on the grounds that the Caste System is but another name for division of labour, and if division of labour is a necessary feature of every civilised society, then it is argued that there is nothing wrong in the Caste System. Now the first thing to be urged against this view is that Caste System is not merely division of labour. It is also a division of labourers. Civilised society undoubtedly needs division of labour but nowhere is division of labour accompanied by this unnatural division of labourers into watertight compartments, grading them one above the other. This division of labour is not spontaneous or based on natural aptitudes. Social and individual efficiency requires us to develop the individual capacity and competency to choose and to make his own career. This principle is violated in so far as it involves an attempt to appoint tasks to individuals in advance, not on the basis of trained original capacities, but on that of birth. Industry undergoes rapid and abrupt changes and an individual must be free to change his occupation and adjust himself to changing circumstances, to gain his livelihood. (Adapted from <i>Annihilation of Caste</i> by Dr. B.R. Ambedkar.) Which of the following observations substantiate the arguments found in the passage above?
(A)	Newer generations are unable to change and move away from low-paying family professions, even with changed economic circumstances.
(B)	Sedentary desk jobs are considered to have more value and are in greater demand than those involving manual labour.
(C)	The government's jobs guarantee programme makes low-level management jobs available across all industries to all graduates in the nation.
(D)	A bus driver becomes an app creator and, in the course of one month, reaches one million downloads on Playstore with a four-star rating.



Q. 14	Imagine that you're in a game show and your host shows you three doors. Behind one of them is a shiny car and behind the others are goats. You pick one of the doors and get what lies within. After making your choice, your host chooses to open one of the other two doors, which inevitably reveals a goat. He then asks you if you want to stick with your original pick, or switch to the other remaining door. What do you do? Most people think that it doesn't make a difference and they tend to stick with their first pick. With two doors left, you should have a 50% chance of selecting the one with the car. If you agree, then you have just fallen afoul of one of the most infamous mathematical problems – the Monty Hall Problem. In reality, you should switch every time which doubles your odds of getting the car. Over the years, the problem has ensnared countless people, but not, it seems, pigeons. The humble pigeon can learn with practice the best tactic for the Monty Hall Problem, switching from their initial choice almost every time. Amazingly, humans do not! (Adapted from an article by Ed Yong in <i>Discover Magazine</i>.) Which of the following conclusions follow from the passage above?
(A)	Humans calculate the probability of independent, random events such as the opening of a door by dividing the specific outcomes by the total number of possible outcomes.
(B)	Humans find it very difficult to learn to account for the host's hand in making the event non-random and, thereby, changing the outcome of the event.
(C)	Calculating probabilities is difficult for humans but easy for pigeons; which is why the pigeons succeed where the humans fail.
(D)	Humans are governed by reason, but pigeons are irrational and only interested in the outcome and will do whatever it takes to get food.



Q. 15	The truth is that, despite the recent success of car-makers P and Q, India's automobile industry is in a state not that different from the bad old days of the license-permit quota raj when two carmakers dominated a captive domestic market with substandard vehicles and with very little, if any, research and development, and low to negligible productivity growth. High tariff barriers have certainly induced foreign automobile makers to enter the Indian market by setting up local operations, but this so-called "tariff jumping" foreign investment has produced an industry that is inefficient, operating generally at a low scale, and whose products are not globally competitive either in terms of cost or of innovation. It is noteworthy that the automobile parts industry, which has faced low tariffs (as low as 12.5%) and has been largely deregulated, has been characterised by higher productivity and much better export performance than the completely-built units' sector in the years since liberalisation. (Adapted from an Op-Ed in <i>The Mint</i>.) Which of the following statements can be inferred from the above?
(A)	Low tariff barriers increase productivity.
(B)	Tariff jumping leads to increases in productivity.
(C)	Deregulation has worked for the automotive parts industry and therefore should be applied to completely-built units.
(D)	P and Q do not invest enough in research and development.



Economics (XH-C1)

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

Q.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
(A)	lower its price by 4%
(B)	lower its price by 2%
(C)	lower its price by 2.5%
(D)	increase its price by 2%

Q.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
(A)	Only (i)
(B)	Only (ii)
(C)	Both (i) and (ii)
(D)	Neither (i) nor (ii)

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



Q.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
(A)	contraction in trade deficit of the country
(B)	widening of trade deficit of the country
(C)	an uncertain net effect on the trade balance
(D)	a huge outflow of foreign portfolio capital from that country

Q.5	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 $y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + u \quad (1)$ In the second model, Rohit regressed y only on x_1 as given below $y = \delta_0 + \delta_1 x_1 + v \quad (2)$ The estimated coefficients of x_1 in the above two models are exactly same. From this observation we can state conclusively that (i) $Cov(x_1, y) = 0$ (ii) $\widehat{\beta}_2 = 0$ (iii) $Cov(x_2, x_1) = 0$ where $\widehat{\beta}_2$ is the estimated coefficient of x_2 in the equation (1)
(A)	Only (i) is true
(B)	Only (ii) is true
(C)	Either (ii) or (iii) or both are true
(D)	Neither (ii) nor (iii) is true



Q.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?
(A)	Yes, the maximum possible total revenue is ₹1500
(B)	No, the maximum possible total revenue is less than ₹1500
(C)	No, the maximum possible total revenue is more than ₹1500
(D)	No, the maximum possible total revenue cannot be estimated

Q.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 price per unit of X. The values in the parentheses are the <i>standard errors</i> of the estimated coefficients. From the estimation one can conclude that
(A)	the demand for good X is highly elastic
(B)	X is an inferior good
(C)	the estimated price elasticity of demand is not statistically significant
(D)	the estimated price elasticity of good X is 2.345



Q.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:
(A)	40
(B)	10
(C)	20
(D)	30

Q.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.
(A)	It will be biased
(B)	It will be inconsistent
(C)	It will be unbiased but inefficient
(D)	It will be unbiased but inconsistent

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



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

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



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



Q.14	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
(A)	$\frac{\bar{y}_1 - \bar{y}_0}{\bar{y}^1 - \bar{y}^0}$
(B)	$\frac{\bar{y}_1 - \bar{x}_1}{\bar{y}_0 - \bar{x}_0}$
(C)	$\frac{\bar{y}_1 - \bar{y}_0}{\bar{x}_1 - \bar{x}_0}$
(D)	$\frac{\bar{y}_1 - \bar{y}_0}{\bar{z}^1 - \bar{z}^0}$

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



Q.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 displays _____ relative risk aversion.
(A)	constant
(B)	increasing
(C)	decreasing
(D)	uncertain

Q.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]
(A)	$S - I = [G - TR - TX] + [X - M]$
(B)	$I - S = [G + TX - TR] + [M - X]$
(C)	$S - I = [G + TR - TX] + [X - M]$
(D)	$I - S = [TX - G + TR] + [NFIA]$

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



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

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



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

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

Q. 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 a(an) _____ estimator of the population standard deviation.
(A)	unbiased and consistent
(B)	biased and consistent
(C)	unbiased and inconsistent
(D)	biased and inconsistent



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

Q. 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
(A)	$(x^*, y^*) = (30, 20)$
(B)	$(x^*, y^*) = (15, 30)$
(C)	$(x^*, y^*) = (30, 15)$
(D)	$(x^*, y^*) = (60, 0)$



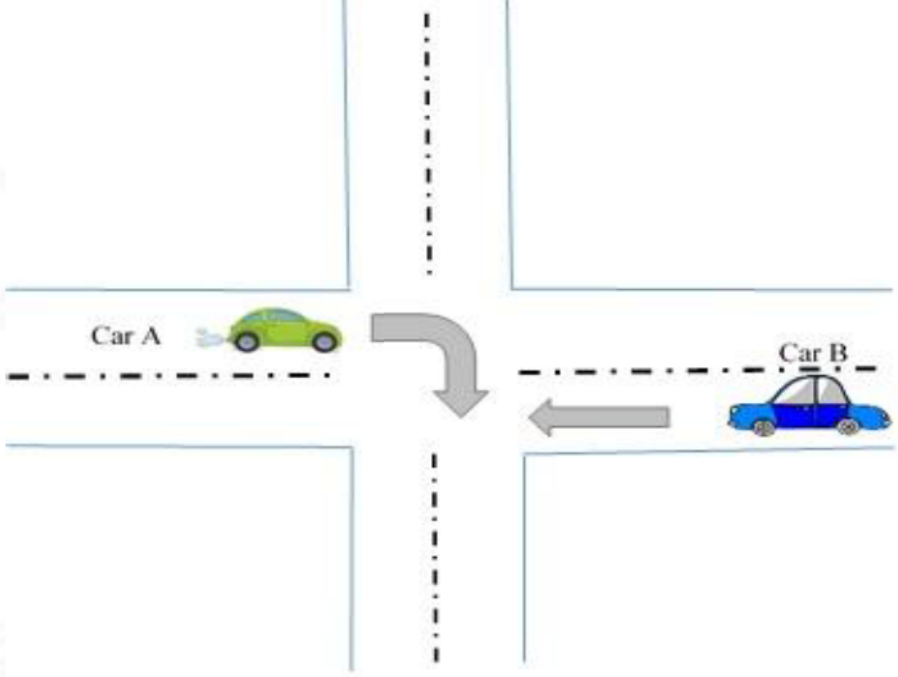
Q. 25	Consider a Cournot type n -firm natural spring oligopoly where the market demand for natural spring water is given by $P(Q) = a - Q$, $a > 0$. The n firms are symmetric. Each firm incurs a bottling cost of $C_i = cq_i$, $c > 0$ and $a > c$. The equilibrium market price will be
(A)	$\frac{(n+1)}{a}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



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

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



Q. 27	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). 
(A)	(Car A, Car B) = (Stop, Stop)
(B)	(Car A, Car B) = (Stop, Proceed)
(C)	(Car A, Car B) = (Proceed, Stop)
(D)	(Car A, Car B) = (Proceed, Proceed)



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

Q. 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
(A)	no change in output
(B)	reduced net exports
(C)	appreciation of nominal exchange rate
(D)	expansion of output

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



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

Q.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).

Q. 32

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).



Q. 33

Consider the following Table.

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

(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).

Q. 34

Consider two regression models estimated on a sample of 350 observations.

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + u \quad \text{-----(1)}$$

$$y = \alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + v \quad \text{-----(2)}$$

The R^2 in model (1) is $R_1^2 = 0.3521$ 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).

Q. 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).

Q. 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).



Q. 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).
--------------	---

Q. 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).
--------------	--

Q. 39

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*).

		User		Final Demand	Total Output
		Agriculture	Manufacturing		
Producer	Agriculture	500	350	150	1000
	Manufacturing	320	360	120	800

Q. 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).
--------------	--

END OF THE QUESTION PAPER

Graduate Aptitude Test in Engineering (GATE 2021)**Subject/Paper: Humanities and Social Sciences (XH) / Economics (XH-C1)**

Q. No.	Session	Question Type MCQ/MSQ/NAT	Section Name	Answer Key/Range	Marks	Negative Marks
1	7	MCQ	GA	D	1	1/3
2	7	MCQ	GA	D	1	1/3
3	7	MCQ	GA	D	1	1/3
4	7	MCQ	GA	D	1	1/3
5	7	MCQ	GA	C	1	1/3
6	7	MCQ	GA	C	2	2/3
7	7	MCQ	GA	A	2	2/3
8	7	MCQ	GA	C	2	2/3
9	7	MCQ	GA	C	2	2/3
10	7	MCQ	GA	D	2	2/3
1	7	MCQ	XH-B1	C	1	1/3
2	7	MCQ	XH-B1	C	1	1/3
3	7	MCQ	XH-B1	C	1	1/3
4	7	MCQ	XH-B1	D	1	1/3
5	7	MCQ	XH-B1	C	1	1/3
6	7	MCQ	XH-B1	A	2	2/3
7	7	MCQ	XH-B1	C	2	2/3
8	7	MCQ	XH-B1	C	2	2/3
9	7	MCQ	XH-B1	D	2	2/3

GATE 2021 Answer Key- Humanities and Social Sciences (XH) / Economics (XH-C1)

Q. No.	Session	Question Type MCQ/MSQ/NAT	Section Name	Answer Key/Range	Marks	Negative Marks
10	7	MCQ	XH-B1	B	2	2/3
11	7	MSQ	XH-B1	C; D	2	0
12	7	MSQ	XH-B1	B; C	2	0
13	7	MSQ	XH-B1	A; B	2	0
14	7	MSQ	XH-B1	A; B	2	0
15	7	MSQ	XH-B1	A; C; D	2	0
1	7	MCQ	XH-C1	C	1	1/3
2	7	MCQ	XH-C1	B	1	1/3
3	7	MCQ	XH-C1	C	1	1/3
4	7	MCQ	XH-C1	A	1	1/3
5	7	MCQ	XH-C1	C	1	1/3
6	7	MCQ	XH-C1	B	1	1/3
7	7	MCQ	XH-C1	C	1	1/3
8	7	MCQ	XH-C1	B	1	1/3
9	7	MCQ	XH-C1	C	1	1/3
10	7	MCQ	XH-C1	B	1	1/3
11	7	MCQ	XH-C1	C	1	1/3
12	7	MCQ	XH-C1	A	1	1/3
13	7	MCQ	XH-C1	A	1	1/3
14	7	MCQ	XH-C1	C	1	1/3
15	7	MCQ	XH-C1	C	1	1/3
16	7	MCQ	XH-C1	B	1	1/3

GATE 2021 Answer Key- Humanities and Social Sciences (XH) / Economics (XH-C1)

Q. No.	Session	Question Type MCQ/MSQ/NAT	Section Name	Answer Key/Range	Marks	Negative Marks
17	7	MCQ	XH-C1	C	1	1/3
18	7	MCQ	XH-C1	B	1	1/3
19	7	MCQ	XH-C1	B	1	1/3
20	7	MCQ	XH-C1	B	1	1/3
21	7	MCQ	XH-C1	B	2	2/3
22	7	MCQ	XH-C1	B	2	2/3
23	7	MCQ	XH-C1	A	2	2/3
24	7	MCQ	XH-C1	B	2	2/3
25	7	MCQ	XH-C1	B	2	2/3
26	7	MSQ	XH-C1	A; C; D	2	0
27	7	MSQ	XH-C1	B; C	2	0
28	7	MSQ	XH-C1	A; B	2	0
29	7	MSQ	XH-C1	A; B; C	2	0
30	7	MSQ	XH-C1	A; B; C	2	0
31	7	NAT	XH-C1	0.6 to 0.6	2	0
32	7	NAT	XH-C1	950000 to 999999	2	0
33	7	NAT	XH-C1	5.300 to 5.600	2	0
34	7	NAT	XH-C1	21.100 to 21.800	2	0
35	7	NAT	XH-C1	3 to 3	2	0
36	7	NAT	XH-C1	8 to 8	2	0
37	7	NAT	XH-C1	4.0 to 4.0	2	0
38	7	NAT	XH-C1	9904 to 9908	2	0

GATE 2021 Answer Key- Humanities and Social Sciences (XH) / Economics (XH-C1)

Q. No.	Session	Question Type MCQ/MSQ/NAT	Section Name	Answer Key/Range	Marks	Negative Marks
39	7	NAT	XH-C1	1860 to 1880	2	0
40	7	NAT	XH-C1	0.70 to 0.80	2	0

