2025-XH-'1-65'

EE25BTECH11020 - Darsh Pankaj Gajare

1) Here are two analogous groups, Group -I and Group -II, that list words in their decreasing order of intensity. Identify the missing word in Group -II.
Group -I: Abuse → Insult → Ridicule
Group -II: _____ → Praise → Appreciate (*GATE EE* 2025)

a) Extol b) Prize c) Appropriate d) Espouse

2) Had I learnt acting as a child, I _____ a famous film star. Select the most appropriate option to complete the above sentence. (*GATE EE* 2025)

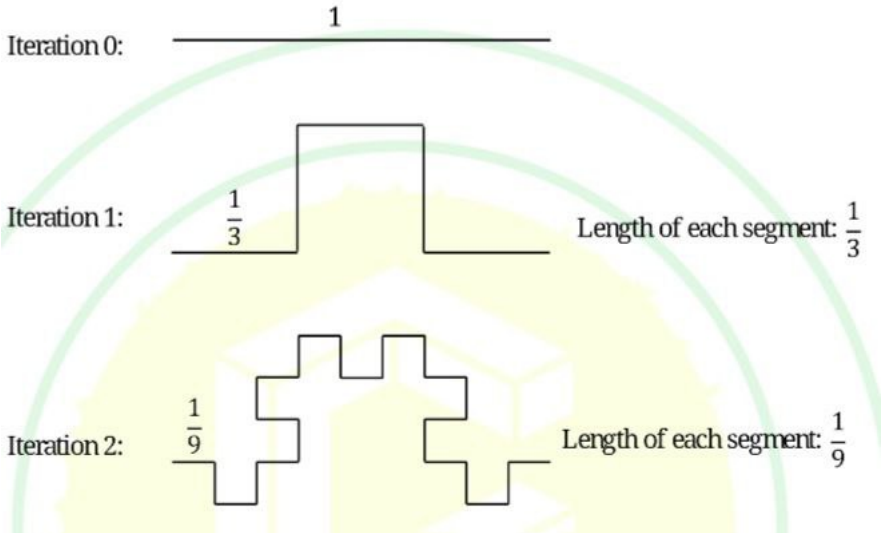
a) will be b) can be c) am going to be d) could have been

3) The 12 musical notes are given as C, C#, D, D#, E, F, F#, G, G#, A, A#, and B. Frequency of each note is $\sqrt{2}^{12}$ times the frequency of the previous note. If the frequency of the note C is 130.8 Hz, then the ratio of frequencies of notes F# and C is: (*GATE EE* 2025)

a) $\sqrt{2^6}$ b) $\sqrt{2}$ c) $\sqrt{2^4}$ d) 2

4) The following figures show three curves generated using an iterative algorithm. The total length of the curve generated after 'Iteration n' is:
Note: The figures shown are representative. (*GATE EE* 2025)

Fig. 1. Q4



a) $\left(\frac{5}{3}\right)^n$ b) $\frac{5}{3^n}$ c) $\left(\frac{5}{3}\right)^{2n}$ d) $\left(\frac{5}{3}\right)^{n(2n-1)}$

5) Which one of the following plots represents $f(x) = -\frac{|x|}{x}$, where x is a non-zero real number?
Note: The figures shown are representative. (*GATE EE* 2025)

Fig. 2. Q5a

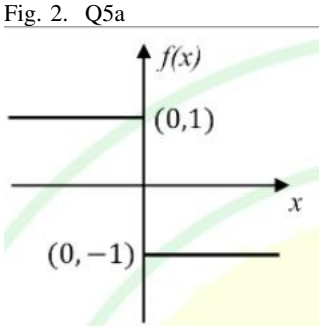


Fig. 3. Q5b

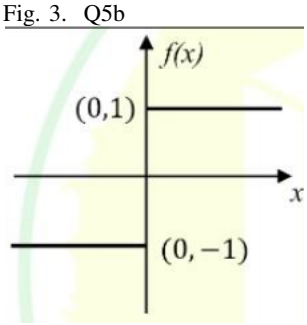


Fig. 4. Q5c

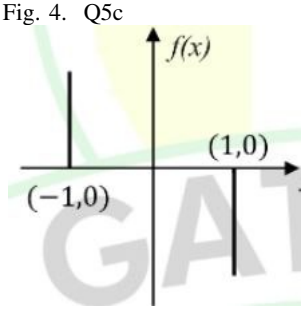
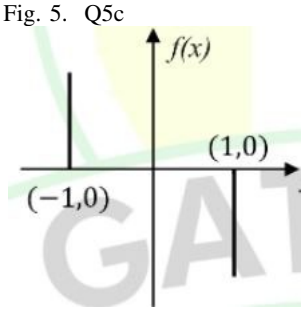


Fig. 5. Q5c



a) b) c) d)

6) Identify the option that has the most appropriate sequence such that a coherent paragraph is formed: P. Over time, such adaptations lead to significant evolutionary changes with the potential to shape the development of new species. Q. In the natural world, organisms constantly adapt to their environments in response to challenges and opportunities. R. This process of adaptation is driven by the principle of natural selection, where favorable traits increase an organism's chances of survival and reproduction. S. As environments change, organisms that can adapt their behavior, structure and physiology to such changes are more likely to survive. (*GATE EE* 2025)

a) P → Q → R → S b) Q → S → R → P c) R → S → Q → P d) S → P → R → Q

7) A stick of length $1\,m$ is broken at two locations at distances b_1 and b_2 from the origin (0), with $0 < b_1 < b_2 < 1$. Which one is NOT a necessary condition for forming a triangle using the three pieces?

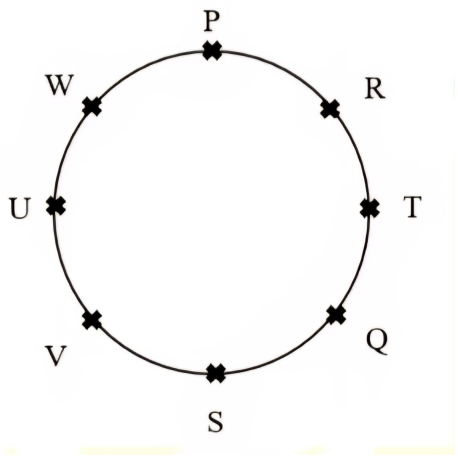
Fig. 6. Q7

(*GATE EE* 2025)

a) $b_1 < 0.5$
b) $b_2 > 0.5$
c) $b_2 < b_1 + 0.5$
d) $b_1 + b_2 < 1$

8) Eight students P, Q, R, S, T, U, V, W are playing musical chairs in a circle (clockwise). After 1st round, 4th behind P leaves; after 2nd round, 5th behind Q leaves; after 3rd round, 3rd behind V leaves; after 4th round, 4th behind U leaves. Who are left after the 4th round?

Fig. 7. Q8



(*GATE EE* 2025)

a) P, T, Q, S
b) V, P, T, Q
c) W, R, Q, V
d) Q, T, V, W

9) The table lists the top 5 nations according to the number of gold medals, also silver and bronze. Based only on this data, which statement is INCORRECT?

Nation	Gold	Silver	Bronze
USA	40	44	41
Canada	39	27	24
Japan	20	12	13
Australia	17	19	16
France	16	26	22

TABLE I
Q9

(*GATE EE* 2025)

a) France will occupy third place if list is based on total medals.
b) The order of top two nations does not change if list is based on total medals.
c) USA and Canada together have less than 50% of total medals.
d) Canada has won twice as many total medals as Japan.

10) An organization allows its employees to work independently on consultancy projects but charges an overhead on the consulting fee. The overhead is 20% of the consulting fee, if the fee is up to ₹5,00,000. For higher fees, the overhead is ₹1,00,000 plus 10% of the amount by which the fee exceeds ₹5,00,000. The government charges a Goods and Services Tax of 18% on the total amount (*the consulting fee plus the overhead*). An employee of the organization charges this entire amount, i.e., the consulting fee, overhead, and tax, to the client. If the client cannot pay more than ₹10,00,000, what is the maximum consulting fee that the employee can charge?

a) ₹7,01,438
b) ₹7,24,961
c) ₹7,51,232
d) ₹7,75,784

11) Which one of the following numbers is odd one out?
31541, 42651, 53791, 64871, 75981

(*GATE EE* 2025)

a) 31541 b) 42651 c) 53791 d) 75981

12) Ankit, Arun, and Ankur have one apple each. Ankur also has one banana. Alam has one mango and one kiwi. Ankit has just bought one pineapple.
Who has the least number of fruit(s)? (*GATE EE* 2025)

a) Ankit b) Arun c) Ankur d) Alam

13) If each vowel in the word **RESIDE** is changed to its previous letter in the English alphabet and each consonant is changed to the next letter in the English alphabet, which one of the following options will be the third from the right? (*GATE EE* 2025)

a) T b) D c) S d) H

14) Vipul, Ahmad, Santosh, and David are playing Carrom. Vipul and Ahmad are partners sitting opposite to each other. David faces towards South. If Vipul faces towards West, then who faces towards the North? (*GATE EE* 2025)

a) Alam b) Santosh c) David d) Vipul

15) Consider the following sentence:
"What the country needs _____ accordingly."
First and last parts of the sentence are given. P, Q, R, and S are the remaining parts of the sentence, not necessarily in that order.
P: and change tactics
Q: who would encourage players
R: are coaches and officials
S: to read the game as it progresses (*GATE EE* 2025)

a) QSPR b) RQSP c) RQPS d) SPRQ

16) A car started from city P at 9:40 AM. The time taken for the car to reach city Q is 4 hours and 50 minutes. The time of arrival of the car at city Q is: (*GATE EE* 2025)

a) 15:10 Hours b) 14:20 Hours c) 14:30 Hours d) 14:10 Hours

17) P is three years younger than R but one year older than S. S is one year older than Q but 4 years younger than R. R is 15 years old. The age of Q is _____ years. (*GATE EE* 2025)

18) In a certain code language, ATTITUDE is written as **TAUJUEDU** and CHILDREN is written as **HCJMENER**. How is LANGUAGE written in that code language? (*GATE EE* 2025)

a) ALOHVEGA b) ALHOVAGA c) LAVOHEGA d) ALHOVGEA

19) The table shows the data of 450 candidates who appeared in the examination of three subjects – Social Science, Mathematics, and Science.

Particulars	Number of candidates
Passed in all the three subjects	167
Failed in all the three subjects	60
Failed in Social Science subject	175
Failed in Mathematics subject	199
Failed in Science subject	191
Passed in only Social Science subject	62
Passed in only Mathematics subject	48
Passed in only Science subject	52

TABLE II
Q19

How many candidates have passed in at least one subject? (*GATE EE* 2025)

a) 48 b) 162 c) 390 d) 425

20) If $\times$ means $+$, $+$ means $\div$, $-$ means $\times$, and $\div$ means $-$, then the value of the expression $28 - 42 \div 7 + 5 \times 3$ is equal to: (*GATE EE* 2025)

a) 13 b) 15 c) 17 d) 19

21) Given a series $5, 8, 11, 14, \ldots$
If the n^{th} term of the given series is 320, then n (where $n \geq 1$) is: (*GATE EE* 2025)

a) 104 b) 105 c) 106 d) 107

22) Suppose your last year taxable income was Rs. 22000. Due to hike in salary, your taxable income this year is Rs. 34200. The details for tax calculation are:

Income range (Rs.)	Tax slab (Rs.)
0 to 5000	2% of income
Greater than 5000 to 10000	100 + 3% of income over 5000
Greater than 10000 to 20000	250 + 5% of income over 10000
Greater than 20000 to 30000	750 + 8% of income over 20000
Greater than 30000 to 50000	1550 + 10% of income over 30000
Greater than 50000 to 100000	3550 + 20% of income over 50000

TABLE III
Q22

What is the additional tax to be paid this year compared to last year? (*GATE EE* 2025)

a) 1970 b) 1060 c) 910 d) 420

23) Anand, Hari, and Chris are engaged in one of the three occupations - clerk, teacher, and plumber, not necessarily in that order. Each person is assigned only one type of occupation. Clerk is Chris's cousin. Hari lives next door to the plumber. Anand, who knows more facts than the teacher, has to drive more than 1 hour to reach Hari's home.
Which one is correct? (*GATE EE* 2025)

a) Anand is teacher and Chris is clerk.
b) Hari is clerk and Anand is plumber.
c) Chris is teacher and Hari is clerk.
d) Anand is clerk and Chris is plumber.

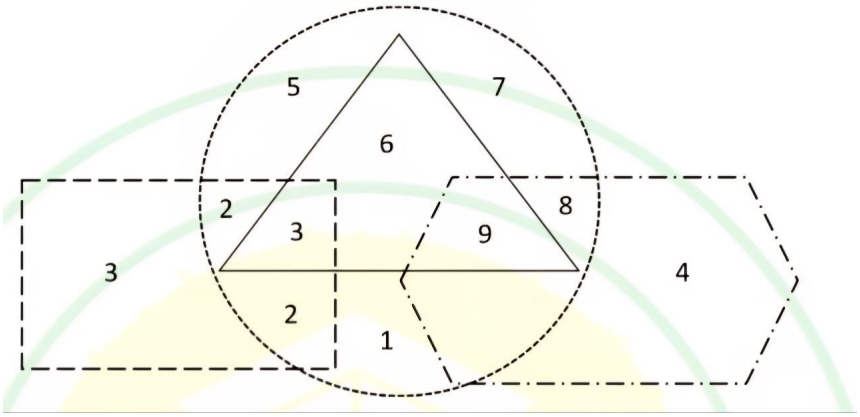
24) Many countries are facing water shortage crises in the past few years. A UN report has named India among the worst countries for poor quality of water. The report ranks 122 countries according to

water quality as well as commitment to improve. Some countries in Europe are considered worst because of ground water. Rain failed in some parts of India; Rajasthan, Madhya Pradesh, and Andhra Pradesh were affected by drought. People without water turn desperate and violent. Consequently, food godowns were attacked in some states.
Which statement(s) is/are correct? (*GATE EE* 2025)

a) There is no proof that India is affected by poor quality of water.
b) A few European countries are suffering due to occurrence of drought.
c) Lack of access to water can lead to social unrest.
d) Intense shortage of water is visible in some states of India.

25) In the following figure, four overlapping shapes (rectangle, triangle, circle, hexagon) are given. The sum of the numbers which belong to only two overlapping shapes is _____.

Fig. 8. Q25



(*GATE EE* 2025)

26) Consider a square field *ABCD*. The diagonal *AC* is 50 *m*. The cost of laying grass is Rs. 5 per sq.m. What is the total cost for laying grass in the field *ABCD*? (rounded off to 2 decimal places). (*GATE EE* 2025)

27) In the context of a perfectly competitive market, identify the statement that is **NOT CORRECT**. (*GATE EE* 2025)

a) Producing less than the competitive output lowers welfare.
b) Producing more than the competitive output lowers welfare.
c) The welfare is dependent on both price and the competitive output.
d) If a consumer values the last unit more than its marginal cost of production, producing an additional unit shall lower welfare.

28) The demand function is given as $\log Q = \log A + 0.5 \log P$ where Q is quantity, P is the unit price of the good and A is a positive real number. The own price elasticity of demand is: (*GATE EE* 2025)

a) Perfectly elastic
b) Perfectly inelastic
c) Elastic
d) Inelastic

29) Which one of the following is part of the unconventional monetary policy? (*GATE EE* 2025)

a) Repo rate
b) Quantitative easing
c) Fractional banking
d) Reverse Repo rate

30) Which one of the following statements is **NOT CORRECT** in the context of Keynesian Absolute Income Hypothesis? (*GATE EE* 2025)

a) Average Propensity to Consume (APC) plus Average Propensity to Save (APS) is equal to one.
b) Marginal Propensity to Consume (MPC) is constant.
c) Average Propensity to Consume (APC) increases as income increases.
d) Marginal Propensity to Consume (MPC) plus Marginal Propensity to Save (MPS) is equal to one.

31) Let $f(x, y, z) = x^2y^3z$. Then, $x\frac{\partial f}{\partial x}(x, y, z) + y\frac{\partial f}{\partial y}(x, y, z) + z\frac{\partial f}{\partial z}(x, y, z) =?$ (*GATE EE* 2025)

a) $f(x, y, z)$
b) $2f(x, y, z)$
c) $3f(x, y, z)$
d) $6f(x, y, z)$

32) Let $f(x) = -3x^2(1 - x) - 3x(1 - x)^2 - (1 - x)^3$. Then, $\frac{df(x)}{dx} =?$ (*GATE EE* 2025)

a) $3x^2$
b) $3(1 - x)^2$
c) $3x(1 - x)$
d) x

33) In the context of environmental cost-benefit analysis, which of the following statements is/are NOT CORRECT? (*GATE EE* 2025)

a) The discount rates do not impact the fixed and variable costs of the project but do impact the perceived benefits in monetary terms.
b) The analysis does not incorporate people's preferences for a policy.
c) The analysis is dependent on the choice of the discount rates.
d) The discount rates are not easily observable and choice is often subject to value judgements.

34) Which of the following statements is/are CORRECT in the context of National Income Accounting? (*GATE EE* 2025)

a) Gross Domestic Product (GDP) is the sum of all factor payments.
b) Net Domestic Product (NDP) = GDP − depreciation.
c) Gross National Product (GNP) = GDP + net income from abroad.
d) Net National Product (NNP) = GNP − GDP.

35) Consider the following system of linear equations: $x + 2y + 3z = 0, \quad 2x + py = 0, \quad 3x + 2y + pz = 0$ The value(s) of p for which the system has infinitely many solutions is/are: (*GATE EE* 2025)

a) $p = 1$
b) $p = 2$
c) $p = 6$
d) $p = 12$

36) Which of the following statements is/are CORRECT? (*GATE EE* 2025)

a) The difference between Human Poverty Index and Human Development Index is that the former focuses on deprivations.
b) The Human Development Index is insensitive to inequalities in the distribution of human development in the population.
c) Income-based poverty lines are sufficient to capture well-being of a country's citizens.

d) Multidimensional Poverty Index considers differences in intra-household distribution of resources.

37) Which of the following statements is/are the key feature(s) of India's New Economic Reforms (1991)? (*GATE EE* 2025)

a) Liberalization of the economy
b) Privatization of public sector enterprises
c) Complete nationalization of all industries
d) Globalization and increased foreign direct investment

38) A Constant Elasticity of Substitution (CES) utility function is: $U_{CES}(z_1, z_2) = \left(z_1^{\delta} + z_2^{\delta}\right)^{\frac{1}{\delta}}, \quad \delta \leq 1,\ \delta \neq 0$ A Quasi-linear (QL) utility function is: $U_{QL}(z_1, z_2) = 2z_1 + \log z_2$ Which of the following statements is/are NOT CORRECT? (*GATE EE* 2025)

a) The CES utility function is homothetic but the QL function is non-homothetic.
b) For $\delta = 1$, the CES function is not strictly convex.
c) The MRS for both functions depends on z_1 and z_2.
d) If $z_1 = z_2$, the MRS is 2 for both functions.

39) Consider a lottery with three possible outcomes:

Outcomes	Probability	Reward/Win (in INR)
I	0.2	25
II	0.3	50
III	0.5	100

TABLE IV
Q39

The maximum amount that a risk-neutral person would be willing to pay to play the above lottery is INR _____ (in integer). (*GATE EE* 2025)

40) For a closed economy with no government expenditure and taxes, the aggregate consumption function (C) is given by: $C = 100 + 0.75Y_d$ where Y_d is the disposable income.
If the total investment is 80, the equilibrium output is _____ (in integer). (*GATE EE* 2025)

41) If X is a continuous random variable whose probability density function is given by $f_X(x) = \begin{cases} \frac{1}{x^2}, & 1 < x < \infty \\ 0, & \text{elsewhere} \end{cases}$ Then the median of X is _____ (in integer). (*GATE EE* 2025)

42) The inverse demand function for a monopolist is given by $P = 100 - kQ$ where P is the unit price of the good, Q is the quantity and k is a constant.
The cost function facing the monopolist is $C(Q) = 50 + 2Q(1 + Q)$ If the profit maximizing output is 7, the maximum profit is _____ (in integer). (*GATE EE* 2025)

43) Consider a simple Keynesian closed economy model with the following information:
The Marginal Propensity to Consume (MPC) is 0.9 and the initial level of saving is INR 120.
When income rises by INR 100, then the new level of saving will be INR _____ (in integer). (*GATE EE* 2025)

44) If X is a continuous random variable whose probability density function is given by $f_X(x) = \begin{cases} cx^3 + 0.25, & 0 \leq x \leq 1,\ c \in \mathbb{R} \\ 0, & \text{elsewhere} \end{cases}$ Then the value of c is _____ (in integer). (*GATE EE* 2025)

45) Consider a three-firms oligopoly market with a linear demand function $P = 25 - Q$ where P is the unit price and Q is the total quantity supplied.
The total quantity $Q = q_1 + q_2 + q_3$, where q_i is the output from the ith firm ($i = 1, 2, 3$).

The total cost curve of firm i is $TC_i = (\alpha_i + 5q_i), \quad \alpha_i > 0$ Assuming a Cournot solution exists, the value of Q is

a) 9
b) 15
c) 12
d) 21

(*GATE EE* 2025)

46) Transfer payments by governments are viewed as

a) Negative taxes
b) Indirect taxes
c) Non-tax revenues
d) Transfer of wealth

(*GATE EE* 2025)

47) Match Column I with Column II.

Column I	Column II
P. Phillips Curve	1. Describes the relationship between devaluation and trade deficit
Q. Kuznets Curve	2. Describes the relationship between tax revenue and tax rate
R. Laffer Curve	3. Describes the relationship between rate of unemployment and inflation
S. J-Curve	4. Describes the relationship between degree of income inequality and level of per-capita income

TABLE V
Q47

a) (P→3), (Q→4), (R→2), (S→1)
b) (P→3), (Q→1), (R→2), (S→4)
c) (P→2), (Q→1), (R→3), (S→4)
d) (P→2), (Q→3), (R→4), (S→1)

(*GATE EE* 2025)

48) Consider the following statements:
1. The new classical policy ineffectiveness proposition asserts that systematic monetary and fiscal policy actions that change aggregate demand will not affect output and employment even in the short run.
2. According to the Real Business Cycle (RBC) model, aggregate economic variables are the outcomes of decisions made by many individual agents acting to maximize their utility subject to production possibilities and resource constraints.

Which option is CORRECT?

a) Only Statement 1 is TRUE
b) Only Statement 2 is TRUE
c) Both statements are TRUE
d) Both statements are FALSE

(*GATE EE* 2025)

49) Consider a two-variable (x, y) linear regression model $y = \alpha+\beta x+\varepsilon$ where α and β are the parameters, and ε is the error term.
The parameters are estimated using OLS. Let b denote the estimated β. If $b = 0$, which statement is CORRECT?

a) R^2 can be any real number in $(0, 0.5]$
b) R^2 can be any real number in $(0.5, 1)$
c) R^2 is any positive real number greater than 1
d) $R^2 = 0$

(*GATE EE* 2025)

50) Let $X_1, X_2, X_3, \ldots$ be i.i.d. random variables with $E[X_1] = \mu$.
Let N be a positive integer valued random variable with $E[N] = n$.
If $S_N = X_1 + X_2 + \cdots + X_N$, then $E[S_N] =$

TABLE VI
Q53

Scenario I	Scenario II
$Y = C(Y-T) + I(r^*) + G + NX(e, Y)$	$Y = C(Y-T) + I(r^*) + G + NX(e)$
$\frac{M}{\bar{P}} = L(r^*, Y)$	$\frac{M}{\bar{P}} = L(r^*, Y-T)$

a) μ
b) $N\mu$
c) $n\mu$
d) μ^n

(*GATE EE* 2025)

51) A Cobb-Douglas type short-run production function is given by $q = 2\sqrt{LK}$ where q, L, and K are the output, labour, and capital, respectively.
K is fixed at $\bar{K}$. The unit price of L is w and the unit price of K is r. It is given that $w = 12$.
Considering the above information, which of the following statements is/are CORRECT?

a) The short-run marginal cost is $\frac{6q}{\bar{K}}$
b) The short-run average variable cost is $\frac{3q}{\bar{K}}$
c) To produce 10 units of output, required L is $\frac{25}{\bar{K}}$
d) For $\bar{K} = 3$ and $r = 4$, the total cost is $12 + 3q^2$

(*GATE EE* 2025)

52) A simple Keynesian open economy model is given by $S + T + M = G + I + X$ where S, I, G, T, X, M stand for saving, investment, government expenditure, taxes, exports, and imports, respectively.
If the country has trade surplus, which strategy/strategies among the following will reduce the trade imbalance?

a) Decrease in private saving
b) Increase in investment
c) Increase in government taxes
d) Decrease in government spending

(*GATE EE* 2025)

53) Consider the two scenarios for a small open economy based on the Mundell-Fleming IS-LM model with floating exchange rate and perfect capital mobility
where Y is aggregate income, C is aggregate consumption, I is investment, r^* is world interest rate, G is government expenditure, T is taxes, NX is net exports, e is exchange rate, M is money supply, and $\bar{P}$ is general price level.
I has a negative relationship with r^*, NX depends negatively on both e and Y, and $\bar{P}$ is fixed.
Given the above information, which of the following statements is/are **CORRECT**?

a) Increase in G has no effect on income in Scenario I.
b) Decrease in T lowers income in Scenario II.
c) Expansionary fiscal policy raises income in Scenario I and Scenario II.
d) Expansionary fiscal policy raises exchange rate in Scenario I and Scenario II.

54) Which of the following statements is/are CORRECT in the context of Foreign Exchange Market?

a) When the value of domestic currency increases vis-Ã -vis the value of foreign currency, the domestic currency experiences appreciation.
b) When the value of domestic currency increases vis-Ã -vis the value of foreign currency, the domestic currency experiences depreciation.
c) When the value of domestic currency decreases vis-Ã -vis the value of foreign currency, the domestic currency experiences depreciation.
d) When the value of domestic currency decreases vis-Ã -vis the value of foreign currency, the domestic currency experiences appreciation.

(*GATE EE* 2025)

55) Which of the following statements characterize(s) the Indian labour market?

a) High workforce participation in agriculture
b) A predominant formal sector employment
c) Increasing Gig and contractual employment
d) A dual structure comprising organised and unorganised sector

(*GATE EE* 2025)

56) Which of the following statements is/are NOT CORRECT?

a) According to the "Pollution Haven hypothesis", trade liberalisation may lead to reallocation of production to countries where either environmental regulations are ineffective or absent.
b) According to the "Porter hypothesis", stringency in ensuring environmental standards often induces firms to become more efficient and prevent technological advancement and innovation.
c) According to the "Race to the Bottom hypothesis", the environmental regulations are progressively made stringent so that economies gain in competition for inward investments.
d) According to the "Environmental Kuznets curve hypothesis", there is an inverted U-shape relationship between per-capita income and environmental quality.

(*GATE EE* 2025)

57) There are two firms in an industry producing a homogeneous product. The market demand function is $P = 1 - (q_1 + q_2)$ Firm 1's cost function is zero. Firm 2's cost function is private: Firm 1 believes it is $0.5q_2$ with probability 0.5 and $0.25q_2$ with probability 0.5.
The firms choose quantities simultaneously. Let q_1^* denote the quantity produced by Firm 1 in the Bayesian Nash equilibrium of this game.
Then, the value of $24q_1^*$ is _____ (round off to one decimal place). (*GATE EE* 2025)

58) Consider a two-person exchange economy with two goods x and y, available in limited quantities of 50 and 100, respectively.
Preferences: $U_{Anil}(x_{Anil}, y_{Anil}) = x_{Anil}^{0.4} y_{Anil}^{0.6}$, $U_{Binod}(x_{Binod}, y_{Binod}) = x_{Binod}^{0.6} y_{Binod}^{0.4}$ If they share good y equally, the amount of good x Anil receives is _____ (in integer). (*GATE EE* 2025)

59) Let Y = income, r = interest rate, G = government expenditure, M_s = money supply.
Closed economy IS-LM model: $Y = 490 + 0.6Y - 4r + G$ $\frac{M_s}{P} = 20 + 0.25Y - 10r$ If $G = 330$ and $\frac{M_s}{P} = 500$, then equilibrium $Y =$ _____ (round off to one decimal place). (*GATE EE* 2025)

60) Harrod-Domar growth equation: $\frac{s}{\theta} = g + \delta$ where s = saving rate, θ = capital-output ratio, g = growth rate, δ = depreciation.
If $\delta = 0$ and $s = 20\%$, then to achieve $g = 10\%$, the capital-output ratio will be _____ (in integer). (*GATE EE* 2025)

61) A coin has a true probability μ of turning up Heads. This coin is tossed 100 times and shows up Heads 60 times. The following hypothesis is tested: $H_0 : \mu = 0.5$ (Null Hypothesis), $H_1 : \mu > 0.5$ (Alternative Hypothesis) Using the Central Limit Theorem, the p-value of the above test is _____ (round off to three decimal places). (Hint: If Z is a random variable that follows a standard normal distribution, then $P(Z \leq 2) = 0.977$) (*GATE EE* 2025)

62) The installation cost (IC) of a solar power plant is INR 89,000. The plant shall be operational for 5 years. The recurring costs for maintenance of the solar plant per year is INR 5,000 but the benefits it creates including reduction in emissions amounts to INR 25,000 per year. These are the only costs and benefits associated with this project. The social discount rate (r) considered is 4% per year. The year-wise information is presented below:

Year (t)	**Discount Factor** $(1+r)^{-t}$	**Benefits (in 000)**	**Costs (in 000)**
0	1		IC
1	0.96	25	5
2	0.92	25	5
3	0.89	25	5
4	0.85	25	5
5	0.82	25	5

TABLE VII
Q62

The net present value of the plant is _____ (in integer). (*GATE EE* 2025)

63) Let $f(x,y) = -x^2 - y^2 + 2x + 4y + 5$ Let (x^*, y^*) denote the solution to the following optimization problem: $\max_{x,y} f(x,y)$ subject to $x \geq 0,\ y \geq 0,\ 2x+y \leq 6$ Then the value of $f(x^*, y^*)$ is _____ (in integer). (*GATE EE* 2025)

64) Two players A and B are playing a game. Player A has two available actions a_1 and a_2. Player B has two available actions b_1 and b_2. The payoff matrix arising from their actions is presented below:

	b_1	b_2
a_1	$(-1, 3)$	$(4, -1)$
a_2	$(3, -4)$	$(-2, 2)$

TABLE VIII
Q64

Let p be the probability that player A plays action a_1 in the mixed strategy Nash equilibrium of the game. Then the value of p is _____ (round off to one decimal place). (*GATE EE* 2025)

65) If the Marginal Propensity to Consume (MPC) of an economy is 0.75, then the value of expenditure multiplier will be _____ (in integer). (*GATE EE* 2025)