



SOMAIYA

VIDYAVIHAR UNIVERSITY

Somaiya School of Humanities and Social Science

QUESTION PAPERS

BRANCH: Bachelor of Science (Economics)	SEM: VI
ATKT	JUN-2026

Sr. No.	Subject	Available
1.	Advanced Mathematical Methods for Economics	
2.	Energy Economics	
3.	Risk Management	q
4.		
5.		
6.		
7.		
8.		
9.		
10.		



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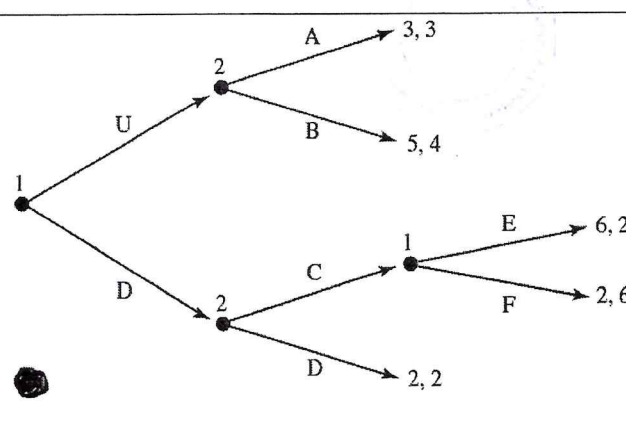


ATKT
BSc. Economics
Sem-VI

April 2026		
Examination: End Semester Examination (UG Programme)		
Programme code: Programme: BSc Economics	Class: SY	Semester: VI
Name of the School: Somaiya School of Humanities and Social Sciences	Name of the Department: Economics	
Course Code:	Name of the Course: Advanced Mathematical Methods for Economics	
Duration: 2 Hrs.	Maximum Marks: 60	
Instructions: 1) Draw neat diagrams. 2) Assume suitable data if necessary		

Question No.		Max. Marks	Co Attainment
Q.1	Answer the following questions		
A	A firm has the following total cost and demand functions: $C = \frac{1}{2}Q^3 - 6Q^2 + 90Q + 40$ $P = 80 - 2Q$ a. Does the total cost function satisfy the coefficient restrictions? b. Write the total revenue function. c. Formulate the total profit function. d. Find the profit maximizing level of output.	08	01
B	Given the demand function $p = \frac{36}{q - 36} + 12$ Where p is the price and q is the quantity, find whether total revenue ($TR = pq$) is maximised, also determine the optimum quantity.	07	01
	OR		
C	Determine whether the curve is increasing or decreasing at the given points, also find the value of x that give y a stationary value. $y = 2x^2 - 6x + 2$ when $x = 2, x = 6$	07	01

D	Examine whether the following function is positive definite or negative definite or neither $z = x^2 - 2xy + y^2$	08	03
Q.2			
A	Determine whether the function maximizing or minimizing by using the Hessian determinant $u = f(x_1, x_2, x_3) = x_1^2 + 2x_2^2 + 3x_3^2$	07	03
B	Find the first and second order differential equation for the following function $u = x^3 + x^2 - xy + y^2 + 4$	08	03
	OR		
C	Write the stationary conditions for the following constraint function $y = x_1^{0.5} x_2^{0.2} x_3^{0.2}$ Subject to constraints $2x_1 + 3x_2 = 100$ $x_2 + 4x_3 = 20$	07	02
D	$\max_{x,y} f(x,y) = -(x-4)^2 - (y-5)^2$ Subjected to constraint $100 = 10x + 5y$	08	02
Q.3	Answer the following questions		
A	Apply Kuhn-Tucker conditions to solve the following constraint function $U = y + \ln x$ <i>subjected to constraint</i> $4x + y \leq 200$	08	02

B	 Write the player lists, each player's strategy space and payoff function. (Hint: use normal form of game)	07	04																							
OR																										
C	Find the Nash equilibrium in above game by using Iterated Elimination of Strictly Dominated Strategy (IESDS). <table><tr><td colspan="2"></td><th colspan="3">Player 2</th></tr><tr><td colspan="2"></td><th>J</th><th>K</th><th>L</th></tr><tr><th rowspan="3">Player 1</th><th>A</th><td>2,3</td><td>10,2</td><td>5,1</td></tr><tr><th>B</th><td>0,1</td><td>2,5</td><td>0,2</td></tr><tr><th>C</th><td>5,0</td><td>0,1</td><td>10,2</td></tr></table>			Player 2					J	K	L	Player 1	A	2,3	10,2	5,1	B	0,1	2,5	0,2	C	5,0	0,1	10,2	08	04
		Player 2																								
		J	K	L																						
Player 1	A	2,3	10,2	5,1																						
	B	0,1	2,5	0,2																						
	C	5,0	0,1	10,2																						
D	Represents the following game in the normal form and find the Nash equilibrium, Two students, Vidit and Ved are taking an exam. Each can either Study honestly (S) or Cheat (C). If both studies then both get good marks (3,3). If one cheats while the other studies then cheater gets top marks (5), honest one gets low marks (1). If both cheats then both risk penalty and get (2,2). Do you think the equilibrium is an efficient equilibrium?	07	04																							
Q.4	Explain the Following with appropriate examples (any three)	15																								
A	Determine whether the following functions is homogenous. If yes, what is the degree?		03																							





	$f(x, y) = (x^2 - y^2)^{\frac{1}{2}}$		
B	Find the first order partial derivative of the following production function with respect to L and K, known as marginal product of labor (MP_L) and marginal product of capital (MP_K). $Q = AK^\alpha L^{1-\alpha}$, ($A > 0, 0 < \alpha < 1$) Where A, α are parameters. What are you observing regarding the sign of MP_L and MP_K?		01
C	Use Lagrange-method to find the stationary value of z $z = x(y + 4)$ subject to $x + y = 8$		02
D	Find the first order differential of the following functions $u = \frac{x^2 - y^2}{x^2 + y^2}$		03
E	Represent the following game in extensive form of game The teacher first decides whether to give a surprise test or not to give a test. If no test is given, the game ends. If a test is given, the student decides whether to study or not study. After observing the student's preparation level, the teacher decides whether to grade strictly or leniently.		04



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ATKT
BSc Economics
Sem-VI

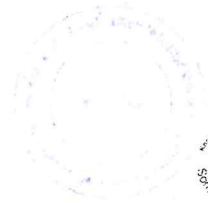
12 JUN 2026

April 2026			
Examination: End Semester Examination (UG Programme)			
Programme code: Programme: BSc Economics		Class: TY	Semester: VI
Name of the School: School of Humanities and Social Sciences		Name of the Department: Economics	
Course Code:	Name of the Course: Energy Economics		
Duration: 2 Hrs.	Maximum Marks: 60		
Instructions: 1) Draw neat diagrams. 2) Assume suitable data if necessary			

Question No.		Max. Marks	Co Attainment
Q.1	Answer the following questions		
A	Do you think current energy system is sustainable? Justify your answer.	08	01
B	Discuss the historical evolution of energy use before and after the Industrial Revolution.	07	01
	OR		
C	What factors have influenced the slow growth of natural gas in India's energy basket?	08	02
D	Why energy is important for the economic growth, productivity, infrastructure development, and household welfare of a country? Explain.	07	01
Q.2			
A	Explain the recent policies implemented by government of India in electricity sector.	07	02
B	Is it feasible to sustain rapid economic growth with low per capita carbon emissions? What measures are necessary to make this possible?	08	02
	OR		
C	Discuss the role of different energy sources in shaping global energy security.	07	03



D	Discuss the objectives of IRADE.	08	03
Q.3	Answer the following questions		
A	Do you think nuclear energy source can be a sustainable source of energy in India? Justify your answer.	08	03
B	Critically analyse the solar energy source in India. Explain the policies implemented by govt of India to promote the solar energy.	07	04
	OR		
C	What policy measures can countries adopt to reduce the adverse economic impacts of energy dependency? (Hint: Explain it by taking the example of current global scenario)	08	04
D	Do you think wind energy can mitigate the increasing demand for energy in India? Explain the advantages and disadvantages of this sources of energy.	07	04
Q.4	Explain the Following with appropriate examples (any three)	15	
A	The electricity act, 1910		02
B	Energy Resources		01
C	Market failure		01
D	Hydropower energy		03
E	Thermal energy in India		04



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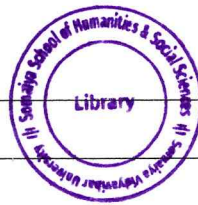


ATKT
Economics
Sem - VI

15 JUN 2026

March/April 2026			
Examination: In Semester Examination (UG Programmes)			
Programme code: Programme: Risk Management		Class: TYBSC	Semester: VI
Name of the School: Somaiya School of Humanities and Social Science		Name of the Department: Economics	
Course Code:	Name of the Course: Risk Management		
Duration: 2 Hr.	Maximum Marks: 60		
Instructions: 1) Draw neat diagrams 2) Assume suitable data if necessary			

Question No.1	Answer Any Two out of the following	Max. Marks: 15	CO
Q.1 (A)	Explain the fundamental strands of risk management in financial institutions.	7	1
Q.1 (B)	What is Implied Volatility? Explain How It Is Derived from Option Prices.	8	1
	OR		
Q.1 (C)	Explain the Role of Internal Audit Teams, Audit Committees, and Non-Executive Directors (NEDs) in Corporate Risk Governance.	7	1
Q.1 (D)	Explain the Concept of Delta Hedging and Its Role in Options Risk Management.	8	1
Question No.2	Answer Any Two out of the following	Max. Marks: 15	CO
Q.2 (A)	Explain Scenario Simulation Analysis and Its Role in Risk Management.	7	2
Q.2 (B)	Explain the concept of stochastic interest rate modelling and its importance	8	2
	OR		
Q.2 (C)	Explain the Pricing and Valuation of Interest Rate Derivatives.	7	2
Q.2 (D)	Explain How Asset-Liability Management (ALM) Helps in Managing Interest Rate and Currency Risk	8	2
Question No.3	Answer Any Two out of the following	Max. Marks: 15	CO
Q.3 (A)	Problem 2-3 Year coupon bond Face value= 1000 Coupon= 10% (₹100 annually) Maturity= 3 years Discount rate= 8% Find the weights of cash flows.	7	3
Q.3 (B)	A bond has: • Face value= ₹ 1000 • Coupon rate= 10% • Market price= ₹ 950 • Maturity= 5 years Calculate the Approximate YTM.	8	3



	OR		
Q.3 (C)	A bond has: • Face value= ₹ 1000 • Annual coupon= ₹ 100 • Maturity = 3 years • Market price= ₹ 960 Calculate the YTM by trial-and-error method.	7	3
Q.3 (D)	A bond has the following: • Price= ₹ 1000 • Duration= 5 • Convexity = 30 • Change in yield= 2% Estimate the bond price change using duration and convexity	8	3
Question No.4	Short notes (Answer Any Three out of the following)	Max. Marks: 15	CO
Q.4 (A)	Distinguish between risk of capital loss for bonds and reinvestment risk. Explain with suitable examples.	5	4
Q.4 (B)	Concept of currency risk and how it affects international investments.	5	4
Q.4 (C)	Importance of sovereign wealth funds in managing national financial assets.	5	4
Q.4 (D)	Stress testing in asset-liability management.	5	4
Q.4 (E)	Monte Carlo simulations in financial risk analysis.	5	4