NOTE: Attempt any FOUR questions. All questions carry equal marks. Student must follow the English Version of the questions Paper and attempt the paper in English only.

Q. No 1. Suppose the firms production function is given by

$$Q - 12L - L^2$$

For L =0 to 6, where L is the labour input per day and Q is the output per day.

a. Derive and draw the firm's demand for labour curve if the firm's output sells for Rs. 10 in a competitive market.   (10)

b. How many workers will the firm hire when the wage rate is at Rs 30 per day?   (7)

c. Why is the firm's demand for labour curve more inelastic when the firm has monopoly power in the output market than when the firm is producing competitively?   (8)

Q. No 2 Consider a lottery with three possible outcomes:

- Rs 125 will be received with probability 0.2
- Rs 100 will be received with probability 0.3
- Rs 50 will be received with probability 0.5

a. What is the expected value of the lottery and what would a risk neutral person pay to pay the lottery?   (8)

b. A prisoner's dilemma game is presented below:

		Prisoner B	
		Confess	Don't Confess
Prisoner A	Confess	-5,-5	-1,-10
	Don't Confess	-10,-1	-2,-2

i. What is the Nash Equilibrium and what is the dilemma (problem) with this Nash equilibrium?   (7)

ii. What different strategies can be used to overcome this problem?   (10)

Q. No 3

a. Describe what happens to the price and quantity of a perfectly competitive firm in short run if a new firm enters the Industry.   (15)

b. Exhibit the long run equilibrium of perfectly competitive firm and how is it different from monopolistically competitive firm?   (10)

Q. No 4

a. A discriminating monopolist is selling a product in two separate markets in which demand and cost functions are as under:

$$P_1 = 80 - 2.5X_1$$
$$P_2 = 180 - 10X_2$$

And the cost function is:

$$C = 50 + 40X$$

    i.   Find out the marginal revenue and marginal cost equations for each market. (6)

    ii.   Find out the equilibrium quantity and price for each market. (9)

b. Explain the concept of bilateral monopoly with the help of a diagram. (10)

Q. No 5 Company X produces soaps in the market.

a. If the price elasticity of a soap is -0.5 and the income elasticity is 1.4, explain the characteristics of this product. (5+5)

b. If the total revenue is to be increased of for the soap manufactured by company X, should they increase their prices or decrease them? Explain your choice using graphs. (15)

Q. No 6

a. With the use of Edgeworth production box, suppose that new invention changes the constant returns to scale food production process into one that exhibits sharply increasing returns. How does this change affect the production contract curve? (15)

b. How does utility possibility frontier relate to contract curve? (10)

Q. No 7 Write comprehensive notes on any of the two following: (25)

a. Expansion Path

b. Marginal Rate of Technical Substitution (MRTS)

c. Chamberlain Theory of Monopolistic Competition.

NOTE: Attempt any FOUR questions. All questions carry equal marks.

نوٹ: کوئی سے چار سوال حل کریں۔ تمام سوالات کے نمبر یکساں ہیں۔

Q No: 1 (a) What is the random walk model? Explain. $12\frac{1}{2}$

(b) How does the real business cycle theory explain the role of external shocks in producing cyclical fluctuation? $12\frac{1}{2}$

(۱) Random walk کے بارے میں آپ کیا جانتے ہیں؟

(ب) تجارتی چکر کے حقیقی نظریہ کاروباری اتار چڑھاؤ میں بیرونی دھچکوں کے کردار کی وضاحت کیسے کرتا ہے۔

Q No: 2 (a) Define and drive the LM curve mathematically and graphically. $12\frac{1}{2}$

(b) Discuss the factors that shift the LM curve. $12\frac{1}{2}$

(۱) ایل ایم خط کی تعریف کریں اور اسکے ریاضیاتی اور گرافیکلی آخذ کریں۔

(ب) ایل ایم کے جھکاؤ کا تعین کرنے والے عوامل پر بحث کریں۔

Q No: 3 (a) Explain the endogenous growth model. $12\frac{1}{2}$

(b) Compare it with Solow growth model. $12\frac{1}{2}$

(۱) Endogenous Growth ماڈل کی وضاحت کریں۔

(ب) اسکا سولو ماڈل کے ساتھ موازنہ کیجئے

Q No: 4 (a) What is crowding out? What causes crowding out? In the face of substantial crowding, explain whether fiscal policy or monetary policy will be more effective? $12\frac{1}{2}$

(b) What is inside-lag and out-side lag? Evaluate the argument that monetary policy should be determined by a rule rather than discretion. $12\frac{1}{2}$

(۱) کراؤڈنگ آؤٹ کیا ہے اور اسکا سبب کیا ہے کونسی پالیسی بہتر زیادہ کراؤڈنگ آؤٹ میں کامیاب تصور ہوگی۔

(ب) اندرونی اور بیرونی وقفہ سے کیا مراد ہے زری پالیسی کو قاعدہ کے تحت ہونا چاہیے صوابدیدی زری پالیسی بہتر نہیں، تنقیدی جائزہ لیں۔

Q No: 5 (a) Explain the Tobin's Q theory. 12/$\frac{1}{2}$

(b) Discuss the role regarding the level of investment in the economy. 12/$\frac{1}{2}$

(ا) ٹوبن کیو تھیوری کی وضاحت کریں۔

(ب) معیشت میں سرمایہ کاری کی سطح کے حوالے سے اس کے کردار پر رو شنی ڈالیں۔

Q No: 6 (a) Drive the Keynesian Aggregate Supply curve when wages are Rigid. 12/$\frac{1}{2}$

(b) Derive the Aggregate supply curve, when wages are Flexible. 12/$\frac{1}{2}$

(ا) غیر لچکدار اجرت کے تحت کینز کے مجموعی خط رسد کو اخذ کریں۔

(ا) لچکدار اجرت کے تحت کینز کے مجموعی خط رسد کو اخذ کریں۔

Q No: 7 (a) Given the following data for an Economy: 25

$$C = 200 + 0.75\, Y^d$$

$$T = 0.2\, Y$$

$$G = 200$$

$$M^d = 0.5Y - 75r$$

$$I = 400 - 50i$$

$$M^s = 900$$

Drive Equilibrium for IS, LM

(b) Find Equilibrium values of Y and i.

(c) Calculate C,S, and I

(d) If G is increased to 350 from 200 and M^s to 1000 form 900, compute the change in income and interest rate.

(ا) آئی ایس اور ایل ایم خطوط کی مساواتیں اخذ کریں۔

(ب) قومی آمدنی اور شرح سود کی قیمتیں معلوم کریں۔

(ج) صرف بچت اور سرمایہ کاری کی قیمتیں بتائیں۔

(د) اگر حکومتی اخراجات دو سو سے بڑھا کر ساڑھے تین سو دیے ہو جائیں اور زر کی رسد نو سو سے بڑھ کر ہزار ہو جائے تو تبدیل شدہ قومی آمدنی اور شرح سود کی قیمتیں معلوم کریں۔

Note: Attempt any FOUR questions. Scientific Calculator is allowed.

1. a) Differentiate the following: (4,4,4)
  i. Increasing and Decreasing Function
  ii. Exponential and Logarithmic Function
  iii. Linear and Quadratic Function

b) Given the following model: (4,3,6)

$$Y = C + I$$

$$C = C_o + bY, \qquad I = I_o + aY$$

Where $C_o = 65, \qquad I_o = 70, \qquad b = 0.6$ and $a = 0.2$

  i. Find the reduced form of National Income Determination model.
  ii. Find the numerical value of equilibrium level of income Y_e.
  iii. Find the numerical values of C and I

2. a) Define the following with examples.   (3, 3, 3)
  i. Null Matrix
  ii. Identity Matrix
  iii. Diagonal Matrix

b) Given the following function: (8, 8)

$$Z = X - 3Y - XY \qquad \text{subject to} \qquad X + Y = 6$$

  i. Find the critical values of X and Y using Lagrangian Multiplier Method.
  ii. Use Bordered Hessian Determinant to check the 2nd order condition.

3.   A Producer who sells a good in two different markets, can discriminate between
the two markets for its product, has the following demand functions: (10,10,5)

$$Q_1 = 21 - 0.1 P_1$$
$$Q_2 = 50 - 0.4 P_2$$

And the total cost function is

$$C = 2000 + 10 Q \qquad\qquad \text{where } Q = Q_1 + Q_2$$

i. What will be the price charged by the producer to maximize profit with price discrimination between the two markets?

ii. What will be the price charged by the producer to maximize profit without price discrimination between the two markets?

iii. Compare the profits of the producer with price discrimination and without price discrimination.

4. a) Write the properties of Inverse of Matrix. (13)

   b) Given $Q = 100 - 2P + 0.02\, Y$, (6,6)

   Where Q is Quantity demanded, P is the price and Y is income and given $P = 20$, and $Y = 5000$

   i. Find Price Elasticity of demand.

   ii. Find Income elasticity of demand

5. a) Use Cramer's Rule to solve the following equation systems. (8)

$$3\, x_1 - 2\, x_2 = 6$$
$$2\, x_1 + x_2 = 11$$

   b) Given the following matrix of technical coefficients A and final demand vector B. (17)

$$A = \begin{bmatrix} 0.2 & 0.3 & 0.2 \\ 0.4 & 0.1 & 0.2 \\ 0.1 & 0.3 & 0.2 \end{bmatrix}, \qquad B = \begin{bmatrix} 100 \\ 50 \\ 60 \end{bmatrix}$$

   Find the correct level of output for three industries.

6. a) Explain the concept of slack variable and surplus variable with example. (10)

   b) Solve the following linear programming problem through graphical approach.

   Maximize the function $\pi = 20\, x_1 + 10\, x_2$ (15)

   Subject to $4\, x_1 + 3\, x_2 \leq 48$

   $3\, x_1 + 5\, x_2 \leq 60$

   $x_1 \leq 9$ $(x_1, x_2 \geq 0)$

7. Write short note on any two of the following: $(12\tfrac{1}{2}, 12\tfrac{1}{2})$
   i. Cobb Douglas Production Function
   ii. Concept of Maxima, Minima and its use in Economics
   iii. Leontief Input Output Analysis

Note: Attempt any FOUR questions. Scientific Calculator is allowed.

Q.1 **a)** Differentiate between: **(3*5=15)**

    (i) Univariate and Bivariate Data
    (ii) Descriptive and Inferential Statistics
    (iii) Qualitative and Quantitative Data
    (iv) Measure of Central Tendency and Measures of Dispersion
    (v) Box Plot and Histogram

b) Calculate geometric and the harmonic means for the distribution given below: **(10)**

Weekly Income	35-39	40-44	45-49	50-54	55-59	60-64	65-69
No. of Workers	15	13	17	29	11	10	5

Q.2 **a)** The probability that a man will be alive in 25 years is 3/5, and the probability that his wife will be alive in 25 years is 2/3. Find the probability that (i) both will be alive, (ii) only the man will be alive, (iii) only the wife will be alive, (iv) at least one will be alive and (v) neither will be alive in 25 years. **(13)**

b) Define the following **(3*4=12)**

    (i) Mutually Exclusive and Exhaustive Events
    (ii) Law of Complementation
    (iii) Conditional Probability
    (iv) Random Experiment, a sample space and an event

Q.3 **a)** Differentiate between multiple correlation and partial correlation. **(05)**

b) Differentiate between coefficient of multiple determination and multiple correlation. **(05)**

c) A statistician wants to predict the incomes of restaurants using two independent variables: the number of employees and the floor area of the restaurant. He collected the following data. **(15)**

Income (in thousands)	30	22	16	12	10	7	4
Floor area (000 sq. ft)	10	5	10	8	9	3	2
No. of Employees	15	8	12	9	12	7	10

    (i) Fit a least square equation of income on floor area and number of employees
    (ii) Interpret the results
    (iii) Predict the income of a restaurant with 7 thousand square feet area and 8 employees.

Q.4 **a)** Define the normal distribution and obtain its mean and variance. **(05)**

b) Show that for the normal distribution, the mean, mode and the median are same. **(05)**

c)   The length of life for an automatic dishwasher is approximately normally distributed, with a mean of 3.5 years and a standard deviation of 1.0 years. If this type of dishwasher is guaranteed for 12 months, what fraction of the sales will require replacement?   (15)

Q.5   a)   Explain briefly the meaning and purpose of moving averages.   (05)

        b)   What is forecasting? What are the different methods of forecasting?   (07)

        c)   Obtain the seasonal indices for the data given below using the link relative method.   (13)

Year	Quarters			
	I	II	III	IV
2000	71	89	106	78
2001	71	90	108	79
2002	73	91	111	81
2003	76	97	122	89

Q.6   a)   What is an estimator? How estimator is different from an estimate?   (06)

        b)   Briefly explain the difference between the following terms: (09)

                (i)   Null and Alternative hypothesis
                (ii)   Sample frame and sample Design
                (iii)   T-test and Z-test

        c)   Given the following ANOVA table: (10)

Source	DF	SS	MS	F-stat
Regression	1	1000		
Error				
Total	14	1500		

                (i)   Complete the ANOVA
                (ii)   Determine the standard error of estimation and interpret it.

Q.7 Write short notes on any three of the following: (25)

        i.   P-value in hypothesis testing
        ii.   Sampling and its different types
        iii.   Chi-square test
        iv.   Properties of Normal and Binomial distribution

NOTE: Attempt any FOUR questions. All questions carry equal marks.

نوٹ: کوئی سے چار سوال حل کریں۔ تمام سوالات کے نمبر یکساں ہیں۔

Q.1. a) What is the role of Islamic Economics in modern era? (12½)

   b) Discuss convergent and divergent dimensions of Islamic and Socialist Economy. (12½)

سوال نمبر۱: (الف) جدید دور میں اسلامی معاشیات کا کیا کردار ہے؟

(ب) اسلامی اور سوشلسٹ معیشت کے ایک جیسے اور مختلف جہتوں پر تبادلہ خیال کریں۔

Q.2. a) How does a consumer achieve equilibrium in Islamic perspective? (12½)

   b) Describe the business ethics in Islamic perspective. (12½)

سوال نمبر۲: (الف) اسلامی نقطہ نظر میں، ایک صارف کس طرح توازن حاصل کر سکتا ہے؟

(ب) کاروباری اخلاقیات کو اسلامی نقطہ نظر میں بیان کریں۔

Q.3. a) Discuss a firm's behavior under perfect competition in Islamic frame work. (13)

   b) Discuss Modarba and Musharka and elaborate the rules of Modarba and Musharka (12)

سوال نمبر۳: (الف) اسلامی فریم ورک میں مکمل مقابلہ کے تحت کسی فرم کے طرز عمل پر تبادلہ خیال کریں۔

(ب) مضاربہ اور مشارکہ کہ سے کیا مراد ہے؟ اور ان کے احکامات کو تفصیل سے بیان کریں۔

Q.4. Write a comprehensive note on the superiority of Islamic Economic System over Capitalism. (25)

سوال نمبر۴: سرمایہ داری پر اسلامی معاشی نظام کی برتری پر ایک جامع نوٹ لکھیں۔

Q.5. a) Define Riba and give the economic rationale for prohibition of Riba (interest) in Islam. (15)

   b) Explain the salient features of Islamic Banking. (10)

سوال نمبر۵: (الف) ربا (سود) کی اصطلاح کی وضاحت کریں اور اسلام میں ربا کی ممانعت کے لئے معاشی استدلال دیں۔

(ب) اسلامی بینکاری کی نمایاں خصوصیات کی وضاحت کریں۔

Q.6. a) Discuss the objectives of monetary policy in an Islamic economy. (12½)

   b) In Islamic frame work how Central Bank performs its functions? (12½)

سوال نمبر۶: (الف) اسلامی معیشت میں مانیٹری پالیسی کے مقاصد پر تبادلہ خیال کریں۔

(ب) اسلامی فریم ورک میں مرکزی بینک کس طرح اپنے فرائض سرانجام دیتا ہے۔

Q.7. a) Write comprehensive note on any TWO of the following. (12½)

   a) Bai Murabaha (12½)

   b) Islam and Economic Planning

   c) Contribution of Ibne Khaldoon in Islamic Economics

سوال نمبر۷: درج ذیل میں سے کسی دو پر تفصیلی نوٹ لکھیں۔

(الف) بیع مرابحہ

(ب) اسلام اور معاشی منصوبہ بندی

(ج) اسلامی معاشیات میں ابن خلدون کی خدمات

NOTE: Answer THREE questions in all including question # 4 which is compulsory.

نوٹ: کوئی سے تین سوالات حل کریں جبکہ سوال نمبر4 لازمی ہے۔

Q.1. (a) Discuss the various approaches to measure poverty. (07)
(b) Define poverty indicators based on the approaches mentioned in part "a". (08)

سوال نمبرا: (الف) غربت کی پیمائش کرنے کے لیے مختلف پیمانوں پر تبادلہ خیال کریں۔

(ب) حصہ "الف" میں بیان کیے گئے پیمانوں کی بنیاد پر غربت کے انڈیکیٹر کی تعریف کریں۔

Q.2. (a) Agriculture is said complimentary sector of industry. Discuss it. (07)
(b) How can we make agriculture sector as engine of economic growth? (08)

سوال نمبر۲: (الف) زراعت اور صنعت کے درمیان تکمیلی شعبہ کی وضاحت کریں۔

(ب) زراعت کو معاشی ترقی کا انجن کیسے بنایا جا سکتا ہے۔

Q.3. (a) Discuss the structure of Public debt in Pakistan. (07)
(b) Which factors are responsible for its current rising trend? Discuss it. (08)

سوال نمبر۳: (الف) پاکستان میں حکومتی قرضوں کی ساخت پر بحث کریں۔

(ب) قرضوں کے بڑھتے ہوئے رجحان کے کون سے عوامل ہیں بحث کریں۔

Q.4. Write detailed note on **TWO** of the following topics: (10+10)
(a) Trade Performance and its instability in Pakistan
(b) Resource mobilization efforts and its impact in Pakistan
(c) Budget Deficit and inflation in Pakistan

سوال نمبر۴: مندرجہ ذیل میں سے کسی دو پر جامع نوٹ لکھیں۔

(الف) پاکستان میں تجارتی کارکردگی اور اس کا عدم استحکام

(ب) "Resource Mobilization" کی کوششیں اور پاکستان میں اس کے اثرات

(ج) پاکستان میں بجٹ کا خسارہ اور افراطِ زر