

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6490

J

Unique Paper Code : 2922101202

Name of the Paper : Financial Institutions and Markets

Name of the Course : **B.A. (Hons.) Business Economics**

Semester : II

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. This paper contains **six** questions. Attempt any **five** of them.
3. **All** questions carry equal marks.
4. Use of simple calculator and time value tables is allowed.

1. Mr. Raj intends to take a home loan of ₹10,00,000 for 15 years. A bank offers him the following options :

Case A: Rate of interest is fixed at 8% for the entire term of the loan.

Case B: Starts with a floating rate of 7%, which changes to 8% after 7 years.

Mr. Raj assumes the rate of interest will remain at 8% for the remaining term of the loan. Assuming that the interest is compounded annually, determine the amount of the installments in each of the above cases and suggest to Mr. Raj which option will be cost effective for him?

(18)

P.T.O.

2. (a) IPO is the most used method for raising funds for expansion plans of the corporates. Explain SEBI-prescribed routes for IPO entry/eligibility norms for a company to launch an IPO in India?
- (b) What do you mean by the Book Building Process? Describe how bidding takes place and how the final share price is determined? (9,9)
3. (a) What is a Rights Issue? Explain the types, procedure and impact of a rights issue on the theoretical price of a share post the issue.
- (b) Aryan Tech Ltd. launches an IPO of 1.5 crore shares at ₹200 per share. Due to overwhelming investor demand, the underwriter activates the Green Shoe Option and over-allots 15% additional shares.
- After listing: The share price falls to ₹185 during the stabilization period.
- The underwriter buys back all the over-allotted shares from the open market at this lower price to stabilize the market.
- (i) Calculate the number of over-allotted shares under the Green Shoe Option.
- (ii) Determine the total amount spent by the underwriter to buy back these shares.
- (iii) Calculate the profit or loss made by the underwriter.
- (iv) Explain how this stabilizes the market price.
- (v) If the share price had risen to ₹220, what would the underwriter do? Would this cause dilution of the promoters' shareholding? (9,9)
4. (a) Explain the various types of orders that an investor can place through a broker while buying or selling securities in the stock market.

- (b) Assume that there are 3 companies J, K & L constituting an index.

The prices and outstanding shares for on 31.12.2024 were as follows:

- Company J: Price = ₹500; Outstanding Shares = 1,000
- Company K: Price = ₹300; Outstanding Shares = 2,000
- Company L: Price = ₹200; Outstanding Shares = 3,000

On 31.12.2024, the Company J announces a 2-for-1 Stock Split.

Prices on 30.6.2025 were as follows :

- Company J: Price = ₹275
- Company K: Price = ₹310
- Company L: Price = ₹190

Assuming the Base Index Value as 1000 answer the following questions :

- (i) Calculate the original market capitalization.
- (ii) Calculate the current market capitalization.
- (iii) Compute the adjusted index using the S&P formula. (9,9)

5. (a) The Indian debt market is primarily dominated by a limited number of large institutional participants. Identify and briefly describe the major participants in the debt market.

- (b) Describe in detail the guidelines involved in the issuance of Commercial Paper (CP) in India. (9,9)

6. Attempt **any three** of the following :

- (a) What are NPAs? Discuss in detail any three tools and legal mechanisms available to manage and reduce Non-Performing Assets in India.

- (b) Explain the objectives, and major functions of the Securities and Exchange Board of India (SEBI).
- (c) Rohit is selling 100 bonds of an 8.8% Government Security (Face Value ₹100) on September 10. Interest is paid semi-annually on January 1 and July 1 and the last interest was paid on July 1. What is the accrued interest on the date of sale. What will be the total amount Rohit will receive on September 10 on the sale of 100 bonds.
- (d) An investor is considering an 8.5% Government of India bond (FV ₹100) currently trading at ₹102, maturing in 4 years. Calculate its YTM. Compare with a fixed deposit giving a YTM of 6.2%, which investment should he go for. (6,6,6)

- (iv) Find the equilibrium of the economy if G changes from 200 to 300 and T changes from 200 to 300.

(5+5+5+3)

6. What is the Keynesian perspective on the Phillips curve and the output-inflation trade-off in the short run? How does the Keynesian view of the long-run Phillips curve and the effectiveness of stabilization policies differ from Friedman's view?

(1000)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6457

J

Unique Paper Code : 2922101201

Name of the Paper : Macroeconomics – I

Name of the Course : **B.A. (H). Business Economics**

Semester : II

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **five** questions in all.
3. Question No. 1 is compulsory.
3. All questions carry equal marks.

1. Write short note on any **three** of the following :—

(a) Liquidity Trap

P.T.O.

- (b) Circular flow in a 3 sector economy—>
 - (c) Points off the IS curve
 - (d) Automatic stabilizers
 - (e) Discount Rate and Required Reserve Ratio as tools of credit creation.
2. (a) Diane Coyle said “GDP tells us how fast an economy is growing and how much it produces. But it doesn’t reveal whether that growth improves well-being or is shared fairly across society.” Comment.
- (b) Do you agree with the view that ‘Not everything that counts can be counted, and not everything that can be counted counts’ when it comes to measuring GDP? Justify your answer with reference to economic activities that may escape being recorded while calculating GDP.
3. “Define the multiplier and explain its mechanism with the help of an example. Analyze the role of the marginal propensity to consume in determining the size of the multiplier, with reference to the assertion: The greater the propensity to consume, the higher the multiplier.

4. Within the classical model analyze the effects of an increase in the marginal income tax rate on both demand and supply side. Explain how output, employment and the price level are affected?
5. Given the following information :—

$$C = 100 + 0.6 Y_d \text{ (Where } Y_d = Y - T \text{)}$$

$$I = 220 - 10i$$

$$T = 200$$

$$G = 200$$

$$L = 0.2Y - 5i$$

$$M \text{ (Real Money Supply)} = 100$$

- (i) Find the IS equation.
- (ii) Find the LM equation.
- (iii) Find the equilibrium income and interest rate and represent it diagrammatically.

This question paper contains 3 printed pages]

Roll No.

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S. No. of Question Paper : 5345

Unique Paper Code : 2924000037

Name of the Paper : Principles of Macroeconomics GE UGCF-2022

Name of the Course : B.A. (H.) Business Economics

Semester : II

Duration : 3 Hours

Maximum Marks : 90

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any five questions,

All questions carry equal marks.

Illustrate your answer with suitable diagrams, wherever required.

1. Explain the concept of the aggregate production function and its key components. What is the Law of Diminishing Marginal Product, and how does it apply to the aggregate production function ? Describe the main determinants of productivity differences across countries. 7+4+7
2. What are the limitations of the measurement of national income in developing economies ? Describe. How do components of expenditure approach to calculate national income differs from income approach ? Discuss. 10+8

P.T.O.

3. Write short notes on any *three* :

6+6+6

(a) GDP Deflator

(b) Monetary policy and its objectives

(c) Steady state capital stock

(d) Credit creation and Credit Multiplier

(e) Tools of Expenditure based Fiscal Policy

4. Which type of counter cyclical fiscal policy is more appropriate to counter a recessionary condition in an economy by raising aggregate demand ? Explain.

What are the fiscal tool which may help policy makers to alter the economic conditions ? Explain with the help of an appropriate examples. 10+8

5. What are the components of supply and demand for credit in credit market ? How do financial institutions act as financial intermediaries ? Explain the elements which causes shift in the supply and demand for credit functions.

Substantiate your answer with appropriate diagrams.

6+4+8

6. What do you understand by the term 'Money'. What are the primary functions of money ? Discuss the role of monetary policy and reserve ratios in determination of money supply and credit creation process. Explain with suitable diagrams. 8+10
7. How do a steady state equilibrium conditions are determined according to Solow growth model ? If rate of saving over the time period rises how it impact the steady state conditions in an economy ? Illustrate your answer with appropriate diagrams. 10+8

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6521

J

Unique Paper Code : 2922101203

Name of the Paper : Statistics for Business Economics – I

Name of the Course : **B.A. (Hons.) Business Economics (2025)**

Semester : II

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **all** questions.
3. Choice is available within each question.
4. Use of simple calculator is allowed.
5. Required statistical tables are attached with this paper.

1. Attempt **any three** the following : (3×10=30)

- (a) The Land holding data of 325 farmers surveyed in a district in India has the following distribution :

Land holding (ha)	0 - <2	2 - <4	4 - <10	10 - <20	20 - <30	30 - <42
No. of farmers	82	124	71	20	15	12

- (i) Construct a histogram corresponding to this frequency distribution and comment on the shape of the distribution.

P.T.O.

- (ii) What proportions of farmers have land holdings less than 24 ha?
Between 16 to 34 ha?

- (b) Given the following data :

15.0 13.0 18.0 14.5 12.0 11.0 8.9 8.0 6.5 14.0 9.5 8.5 7.5 13.5

Determine the values of the sample mean, sample median, and 12.5% trimmed mean, and compare these values.

- (c) The given data consists of marks obtained by the students of JLN University in Physics in Semester I.

211 408 171 178 359 249 205 203 201 223 234 256 218

- (i) Construct a boxplot for the given data and comment on its features.
- (ii) How large or small does an observation have to be to qualify as an outlier? Are there any outliers in the sample? Any extreme outliers?
- (d) (i) From a moderately skewed distribution of retail prices for men's shirts, it is found that the mean price is Rs. 250 and the median price is Rs. 190. If the coefficient of variation is 30%, find the Pearsonian coefficient of skewness of the distribution.
- (ii) Weekly average wages of workers in a factory increase from Rs. 800 to Rs. 1200 and standard deviation increases from Rs. 100 to Rs. 500. Comment on the resulting wage structure.

2. Attempt **any four** of the following :

(4×10=40)

- (a) (i) Disks of polycarbonate plastic from a supplier are analyzed for scratch and shock resistance. The results from 100 disks are summarized below :

		Shock resistance	
		High	Low
Scratch resistance	High	70	9
	Low	16	5

Let A denote the event that a disk has high shock resistance, and let B denote the event that a disk has high scratch resistance. If a disk is selected at random, calculate :

Find: (i) $P(A/B)$ (ii) $P(B/A)$ (iii) $P(A \cup B)$ (iv) $P(A')$

- (ii) A company produces light bulbs at three factories A, B, C. Factory A produces 40 percent of the total number of bulbs, of which 2 percent are defective. Factory B produces 35 percent of the total number of bulbs, of which 4 percent are defective. Factory C produces 25 percent of the total number of bulbs, of which 3 percent are defective. If a defective bulb is found among the total output, find the probability that it came from: (a) factory A, (b) factory B.

- (b) (i) The random variable X has the following probability distribution :

x	2	3	5	8
P(x)	0.2	0.4	0.3	0.1

Calculate

- (i) $E(X)$ (ii) $V(X)$ (iii) $E(2X-7)$ (iv) $V(2X-7)$

P.T.O.

- (ii) The tensile strength of paper is modeled by a normal distribution with a mean of 35 pounds per square inch and a standard deviation of 2 pounds per square inch.
- (a) What is the probability that the strength of a sample is less than 40 lb/in²?
- (b) If the specifications require the tensile strength to exceed 30 lb/in², what proportion of the samples is scrapped?
- (c) (i) The shelf life (in hours) of a certain perishable packaged food is a random variable whose probability density function is given by

$$f(x) = \begin{cases} \frac{K}{(x + 100)^3}, & x \geq 0 \\ 0, & \text{otherwise} \end{cases}$$

- (a) Calculate the value of K.
- (b) Find the probability that the packaged food will have a shelf life between 80 to 120 hours.
- (c) The number of requests for fire brigade service received follows a Poisson process with rate of 4 per hour. Compute the probability that exactly five requests are received during a particular 2-hour period. What is the probability that no requests in a 15 minutes period.

- (d) (i) Let X be a random variable with the following distribution function :

$$F(x) = \begin{cases} 0 & x < 0 \\ \frac{1}{3}x + \frac{2}{3} & 0 \leq x < 1 \\ \frac{2}{3} & 1 \leq x < 2 \\ 1 & x \geq 2 \end{cases}$$

Calculate:

(a) $P(X < 1/2)$.

(b) $P(X < 3/2)$.

(c) $P(1/2 < X < 2)$.

(d) $P(X = 1)$.

- (ii) Suppose that the joint probability function of X and Y is as specified in the following table :

	Y				
X	0	1	2	3	4
0	0.08	0.07	0.06	0.01	0.01
1	0.06	0.1	0.12	0.05	0.02
2	0.05	0.06	0.09	0.04	0.03
3	0.02	0.03	0.03	0.03	0.04

Determine each of the following probabilities :

(i) $P(X = 2)$ (ii) $P(X < 2 \text{ and } Y < 2)$ (iii) $P(X = Y)$

- (e) Suppose that X and Y have a continuous joint distribution for which the joint probability density function defined as follows :

$$f(x, y) = \begin{cases} \frac{3}{2}y^2 & 0 \leq x \leq 2, 0 \leq y \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

(i) Determine the marginal densities of X and Y.

(ii) Are X and Y independent?

3. Attempt **any two** of the following : (2×5=10)

- (a) (i) State three properties of coefficient of correlation.
- (ii) The correlation coefficient between two variables X and Y is found to be 0.5. What is the correlation between 3X and (−Y)?
- (b) The rank correlation of MBA students in participating in 'Bazar' game involving 11 participants was calculated as 0.6. However, it was later discovered that the difference in ranks of a participant was read as 8 instead of 3. Find the correct value of rank correlation.
- (c) Calculate the Karl Pearson's coefficient of correlation in the following series related to cost of living and wages :

Wages	100	101	103	102	100	99	97
Cost of living	98	99	99	97	95	92	95

4. Attempt **any two** of the following : (2×5=10)

- (a) (i) Assume that an index number is 100 in 2013-14, it rises 4% in 2014-15, falls 1% in 2015-16, rises 3% in 2016-17 and rises 4% again in 2017-18. The rise and fall begin with respect to the previous year. Calculate the index of the 5 years using 2017-18 as the base year.

- (ii) A worker earned Rs.900 per month in 2020. The cost of living index has increased by 70% between 2020 and 2023. How much extra annual income should the worker earn in 2023 so that he could the same level of quantities as in 2020? What should be nominal annual salary in 2023 if worker is given a 10% increment is given on the real salary?
- (b) (i) In the data given below, 2013 is the year of discontinuation of the old series. Construct a continuous series by Splicing.
- (a) Old series and (b) New series.

Year	Index (old series)	Index (new series)
2010	98	
2011	100	
2012	104	
2013	110	100
2014		106
2015		108
2016		114

- (ii) Compute the Fisher price index number from the following information taking 2022 as the base :

Commodity	2022		2024	
	Price	Qty.	Price	Qty.
A	2	74	3	82
B	5	125	4	140
C	7	40	6	33

Subject: Preparation of Folder for Audit (JAN–JUN 2025, Even Semester)

Dear Everyone,

I have prepared a folder for the Audit (JAN–JUN 2025, Even Semester II, IV, and VI) on the drive

https://drive.google.com/drive/folders/1fUW7yGRbuhq6H3TjaxjqjMLcFSMOmDM5?usp=drive_link, which will be used for the upcoming audit. Each faculty member is kindly requested to:

- Ensure that all documents are **duly signed** before submission.
- Rename all proof files with your **full name** for easy identification.
- Verify that any **external links attached are accessible and functioning** properly.

The folders are organised as follows:

Teaching Plan: <https://docs.google.com/spreadsheets/d/1MhU5mKkq3CFMJoj-kqrX6XkkzgR7JRn1/edit?usp=sharing&oid=104022421916253217021&rtpof=true&sd=true>

Question Papers/Assignments:

https://drive.google.com/drive/folders/1WYSvaKNVLKriAv6fxrHHMul1aAXiHeGVn?usp=drive_link

Remedial Classes:

https://drive.google.com/drive/folders/1eGt1JJHuwjBazIGdgiyTFUsDqsDJaeBV?usp=drive_link

Mentor-Mentee Minutes:

https://drive.google.com/drive/folders/158PbUMwuXBh3BxOjdxQliI-BrVMxXYSe?usp=drive_link

Internal Assessment:

https://drive.google.com/drive/folders/1iuGGQILXleY16mo77Fz5K4oxt_QkuROW?usp=drive_link

Slow/Fast/Non-Performing Students:

https://drive.google.com/drive/folders/1OpFx9YY4jqj3kSHdGL0FTYLg-yyoEaPoD?usp=drive_link

Faculty Achievements: (Proofs)

https://drive.google.com/drive/folders/1NGaXp_QcEbzyNmjHfoJyvP2kgTJksVgj?usp=sharing

S. No.	Activities	Link to list including documentary proof
(i)	Publication by faculty members (a) Research Paper (b) Book/ Chapter in a book/ Translation of book (c) Patent	Template 4(a)(i)

(ii)	Major/ Minor research projects	<u>Template 4(a)(ii), (iii), (iv)</u>
(iii)	Research Supervision (Supervisor/Co-supervisor for Ph. D., M. Phil, PG/UG dissertation, Summer/ Winter research internship)	
(iv)	Subject Expert in activities outside the college (Invitation Letter as expert to be attached as proof)	
(v)	(a)Faculty participation in academic program (conference, seminar, faculty induction/development programs, Refresher course, orientation program, short term course etc.) with / without financial support (b) Membership in professional bodies with/ without financial support	<u>Template 4(a)(v)</u>
(vi)	Award/ honor	<i>Hyperlink to document on Department Drive</i>
(vii)	Any other achievement	

Faculty Academic Duties for Proofs

https://drive.google.com/drive/folders/1gajGzygilj_JTvTFVocRJ6b4Vx9_QUE1?usp=drive_1ink

S. No.	Activities	Link to List along with documentary proof
(i)	Member of Academic Council/Board of Studies/ of Affiliated University	<u>Template 4(b)</u>
(ii)	Setting of Question Papers for UG/PG Programs including University of Delhi	
(iii)	Design and Development of Curriculum for Add on/ Certificate/ Diploma Courses/ revision of courses of University of Delhi	
(iv)	Assessment /evaluation process of the affiliating University	
(v)	- Internal/ External Examiner for end semester practical examination - Invigilation duties in end semester practical and theory examination	<u>Examination</u>
(vi)	Any other	

Student Progress: Current Students' Achievements

https://drive.google.com/drive/folders/1Vhgi3XRNjh7zaXTQwnGtp-0FM0GDFvTb?usp=drive_link

S. No.	Activities	Link to document as per template
(i)	Awards List of awardees in inter-college academic and extracurricular activities	<u>Template 3(i) award</u>
(ii)	Scholarship Scholarships by govt./non-govt. agency	<u>Template 3(ii) Scholarship</u>

(iii)	Experiential learning (a) Internship/ Projects/Field visits (b) Participation in any outreach/extension activities (outside the college)	<u>Template 3(iii) experiential learning</u>
(iv)	Participation in Sports/Cultural Events/Competitions organized by the institution or other institutions	<u>Template 3(iv) participation events</u>

Departmental Activities: Events like seminar, conference, workshop, academic talk, department festival, etc. • Name of Event • Event Report (200-250 words) • 2 representative JPEG image files (with legend and geotag) • Signed Attendance list • Feedback (Signed by convener) • Proof of media coverage to be attached, if any. **(Conveners of different events like seminar, conference, optimum etc. make a folder of the event in this link and upload the required report and documents)**

https://drive.google.com/drive/folders/1ZpqHZ8qNauxc1Yy2CDbaukCsJxZLTdNE?usp=drive_link

Short Term/ Ad-on Course • Name of the Course, Duration, Collaboration, if any and other details • Poster, Brochure etc. • List of participants (signed by them) • Few Certificates

https://drive.google.com/drive/folders/1edtDu-uru14-WJFSkIy8XME8oPglv_G?usp=drive_link

Alumni Data:

https://drive.google.com/drive/folders/1X9WedFKz5rKIu3GTLHzMpwvPSTrAE1xD?usp=drive_link

S. No.	Activities	Link to Document
(i)	Student Progression Information of alumni (of previous graduating batch) enrolled in higher studies/employed in offices to be provided Filling of Google form by the previous graduating batch is compulsory. Proofs mandatory.	<u>Template 5(i)</u>
(ii)	Information about the alumni (of past graduating batches till date)	<i>Hyperlink to document on Department Drive</i>
(iii)	Alumni qualifying NET, GATE, SET, UPSC, and other competitive exams	<u>Template 5(iii)</u>

Minutes of Meetings: https://drive.google.com/drive/folders/19AVTxGF-AJEE69Ed3oppfqRnE8YOFAXa?usp=drive_link

Result Analysis:

https://drive.google.com/drive/folders/1mVhr8is_xkr3Kr4sIofD3Bn_I_WRwj8e?usp=drive_link

Your cooperation is highly appreciated.

S.No. of Q. Paper: 9218

Macroeconomics & Applications II (LOCF) – Semester IV

Unique paper code: 12481401

B.A. (H) Business Economics

Duration: 3 Hours

Maximum Marks: 75

Instructions for Candidates:

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt five questions in all.
3. All questions carry equal marks.
4. Draw diagrams wherever necessary.

Q. 1) Explain how Fisher's Intertemporal Consumption Model resolves consumption behavior with suitable diagrams. Why are changes in consumption unpredictable if consumers obey the permanent income hypothesis and have rational expectations?

Q. 2) Explain why an increase in interest rate reduces the amount of residential investment. What are the reasons for a firm to hold inventories? Explain the Tobin's q theory of investment.

Q. 3 The government reduces taxes after creating a balanced budget, which results in a budget deficit. What will happen to debt in the long run? Will the government eventually have to raise taxes? If so, by how much? Explain in detail.

Q.4) What do you understand by the term "Inflation Targeting"? Explain various costs and benefits of inflation. Should the central bank try to adopt a zero inflation rate to achieve price stability? Justify

Q.5) Using the concept of current vs. future taxes, explain the concept of debt repayment in " t " years and debt stabilization over the years. Also, explain the algebraic equations of the evolution of the debt-GDP ratio over time with their implications.

Q.6) Explain in detail the concept of Interest Rate Differentials in the Mundell-Fleming Model. Also, diagrammatically explain the concept of the J-Curve.

Q.7) Using the Mundell-Fleming model, explain the impact of expansionary fiscal policy, monetary policy, and trade policy on GDP, interest rate, and current account balance under a flexible exchange rate framework.

P.T.O.

Q.8)

Write short notes on any THREE of the following: (5×3=15)

- (a) Fixed vs. Flexible Exchange Rate
- (b) Shoe-leather Costs and money illusion
- (c) Purchasing Power Parity
- (d) Ricardian Equivalence

6005

4

6. (a) Differentiate between the monetary and asset market approach to the Balance of payment adjustment. (10)
- (b) What is the J curve? When does an economy's trade balance may follow J curve behaviour? What are the assumptions which are taken to explain the trade balance behaviour? (8)

(700)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6005 J

Unique Paper Code : 2922102401

Name of the Paper : Macroeconomics II

Name of the Course : **B.A. (Hons.) Business Economics**

Semester : IV

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll. No. on the top immediately on receipt of this question paper.
2. All parts of each question must be done together.
3. Attempt **FIVE** questions in all.
4. **Question No. 1** is compulsory.

P.T.O.

6005

2

1. State whether true or false. Give reasons/diagram in support of your answer. Any three (3×6)
 - (a) According to Absolute Income Hypothesis, J M Keynes proposes a positive correlation between current income and consumption.
 - (b) Inflation adaptive Phillips curve does not consider expected inflation as an important determinant of current inflation.
 - (c) Milton Friedman consumption model hypothesize that consumption deviation occurs due to transitory income.
 - (d) Neo classical model of Business Fixed Investment does not consider rate of depreciation and inflation as a determinant of investment.
 - (e) The aggregate demand function states positive relationship between price level and level of income or output.
2. The inter temporal choice consumption model optimization is based on equity of the slope of inter

6005

3

- temporal budget constraint and time indifference curve. Explain. How do we know a borrowing constraint is binding or non-binding? (10+8)
3. How is natural rate of unemployment determined in wage setting and price setting framework? Support your answer with suitable diagram. (18)
4. (a) The consistency of positive inflation rate during 1970s period made significant change in relationship between inflation and unemployment. Discuss. (10)
 - (b) An increase in firm's profit margin and provisions of unemployment allowances change the equilibrium conditions of labor market as well as natural rate of unemployment. Describe. (8)
5. (a) Derive the Aggregate Supply equation and Aggregate Demand equation and plot it on the diagram. (10)
 - (b) Discuss the concept of purchasing power parity. (8)

P.T.O.

- (b) Explain the concept of product mix decisions in detail, including key dimensions such as product mix width, length, depth, and consistency. How do these decisions impact a company's branding and market strategy? Illustrate your answer with an example from an industry of your choice. (8)
5. (a) Distribution channels can have varying levels depending on the number of intermediaries involved. Define and differentiate between the various channel levels in the context of marketing. Explain how the choice of channel level impacts the reach, cost, and control for the manufacturer. Support your answer with suitable examples from different industries to illustrate each level. (10)
- (b) In practical marketing scenarios, how do personal selling and direct marketing differ in terms of approach, customer interaction, and effectiveness, and how should businesses decide which method to use based on their product type, target audience, and sales objectives? (8)
6. Write short notes on any **three** of the following:
- (a) Price discrimination strategies
 - (b) Core marketing concepts
 - (c) Advertising reach and frequency
 - (d) Brand Equity (3×6)

(1000)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6123 J

Unique Paper Code : 2922102403

Name of the Paper : Marketing Management

Name of the Course : **B.A. (Hons.) Business Economics (2025)**

Semester : IV

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
 2. Question 1 is compulsory.
 3. Attempt **five** questions in all.
-
1. Zepto is a fast-growing quick-commerce startup that promises grocery delivery in just 10 minutes. It has gained popularity in major Indian cities where people value speed and convenience. One key factor behind its success is the use of "dark stores" - small warehouses located close to customers that enable faster deliveries. Zepto also uses smart technology to manage inventory and plan delivery routes efficiently.

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It's simple, user-friendly app makes it easy for customers to order groceries anytime. The demand for quick home delivery increased during the COVID-19 pandemic, which further boosted Zepto's growth. Young, urban consumers, especially working professionals, have been quick to adopt the service. With strong investor support, Zepto has expanded rapidly and now competes with major players like Blinkit and Swiggy Instamart.

Please answer the following questions based on the above case let :

- (a) Evaluate the effectiveness of Zepto's 10-minute delivery promise as a marketing USP- What other factors have been the key drivers for the growth of the platform in the urban households? Discuss. (10)
 - (b) Going forward, what challenges can the platform face? Suggest suitable solutions using the marketing techniques. (8)
2. The Unified Payments Interface (UPI) has become a key driver of India's digital economy. In 2025, with increasing AI integration, evolving RBI regulations, global interest in India's fintech model, and rising concerns around cybersecurity and data privacy, evaluate the factors and effect of political, economic, socio-cultural, technological, ecological and legal

environment on the current and future prospects of UPI. Provide relevant examples to support your analysis. (18)

3. (a) You are part of the marketing team at a tech startup launching a new AI-powered air purifier designed to automatically adjust filtration levels based on real-time air quality, occupancy, and user habits. Using the STP (Segmentation, Targeting, Positioning) framework, develop a detailed marketing strategy for this product, clearly specifying the basis of segmentation, choice of target market and a strong, clear positioning statement that highlights the unique value proposition of the AI- powered purifier and differentiates it from traditional air purifiers. (10)
 - (b) How can a resource-constrained startup develop a cost-effective and impactful promotion mix to successfully compete against well-established brands in the market? (8)
4. (a) How can a product manager of an Indian FMCG company leverage the BCG Matrix and Ansoff Matrix to make strategic decisions on product investments, growth opportunities, and market expansion? Please provide a detailed explanation of both the models followed by illustrations. (10)

Serial No. of Question Paper : 9152
Unique Paper Code : 12483303
Name of the Course : B.A. (H) Business Economics, 2025
Name of the Paper : Research Methods and Statistical Packages (SEC)
Semester : IV
Maximum Marks : 75
Duration : 03 Hours

Instructions:

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any five questions. All questions carry equal marks.
3. Use of simple calculator and statistical tables is allowed.

- Q.1 (a) Distinguish between Exploratory, Descriptive and Causal research? (9)
- (b) What do you understand by Focus group interviews? Discuss its relevance as a primary data collection tool. (6)
- Q2. A researcher is interested in conducting a student satisfaction survey regarding the program of study the student is currently enrolled in. He wants to find whether students are satisfied with the curriculum, resources, teaching methodology, future scope etc. of the program. Design a comprehensive questionnaire with at least 15 questions, keeping in mind all the pre-requisites of a good questionnaire. The questionnaire should have a mix of demographic, scale-based and open-ended questions. (15)
- Q3 (a) What are the four primary scales of measurement. Clearly bring out the difference between them by stating relevant examples. (8)
- (b) What do you understand by Probability sampling techniques? Explain its various types with examples. (7)
- Q4. The school administration is interested to know the preference of its students for different streams-Science, Commerce or Humanities. It collects data on the preferred stream, gender, total score obtained in class 10, Marks obtained in English, Mathematics and Science (separately), income category (low, middle or high -determined on the basis on annual family income).
- (a) The administration is interested to know whether gender influences the preference for streams. Which test should be performed? How is this test performed in SPSS/PSPP? Clearly state the hypothesis involved? (4)
- (b) The administration also wants to know whether the performance of students is consistent across the three subjects-English, Mathematics and Science.
- (i) To test whether average marks are same across all streams, which test should be performed? How will you perform this test in SPSS? State the hypothesis clearly. (2)
- (ii) What assumptions should be satisfied before performing the test? (2)
- (iii) What alternative is available if any of the assumptions is not satisfied? How will you do the alternative test in SPSS/PSPP? (2)

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- (c) How will you test of normality of the error term graphically and mathematically in SPSS/PSPP? (5)

Q.5 (a) Following tables report regression output of 100 individuals where their fitness score measured by maximal aerobic capacity (MAC) is regressed on their age, gender, weight and heart. Gender is a dummy variable that is coded as 1 if female else 0.

Table-1 Model Summary

R	0.760
R square	0.577
Adjusted R Square	0.559
Standard error of the estimate	5.69097
F statistic	32.393
(Sig.)	(0.000)

- a. Predictors: (constant), gender, age, heart_rate, weight
b. Dependent variable: Maximal Aerobic Capacity (MAC)

Table 2: Coefficients

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	Beta	Std. error	Beta		
Constant	87.830	6.385		13.756	0.000
age	-.165	.063	-.176	-2.633	0.010
gender	13.208	1.344	0.748	9.824	0.000
weight	-.385	.043	-.677	-8.877	0.000
Heart_rate	-2.118	3.42	.748	-0.69	0.275

- a. Predictors: (constant), gender, age, heart_rate, weight
b. Dependent variable: Maximal Aerobic Capacity (MAC)

Based on Table1 and Table 2,

- Write regression equation of the above model and interpret it. (3)
- Comment on the overall goodness of fit of the model. Write the hypothesis clearly. (2)
- How will you interpret the coefficient of the dummy gender? Do you think gender is influencing the dependent variable? (2)
- Explain the difference between standardized and unstandardized coefficients. (2)

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- v. Indicate the significance of the explanatory variables-age, weight and heart rate clearly indicating the null and alternative hypothesis involved. (3)

(b) How will you test multicollinearity in SPSS/PSPP? How do you interpret the value of the indicator so obtained? (3)

Q6. Write short notes on any three of the following. (5*3)

- (a) Rank Order Scaling and Constant Sum Scaling Techniques
- (b) Reliability and validity of a research instrument
- (c) Quota sampling and snow ball sampling
- (d) Errors in hypothesis testing
- (e) Primary vs Secondary data

[This question paper contains 12 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6067

J

Unique Paper Code : 2922102402

Name of the Paper : Statistics for Business Economics – II

Name of the Course : B.A. (Hons.) Business Economics

Semester : IV

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **all** questions. Choice is available within each question.
3. Use of simple calculator is allowed.
4. Required statistical tables are attached with this paper.

1. Attempt any **two** questions : (2×10)

- (a) A population consists of the set $S = \{4, 6, 8\}$ with each number having probability of selection given by :

x	4	6	8
P(x)	0.2	0.3	0.5

Random samples of size 2 are picked up from the population with replacement. Construct a sampling distribution of sample means and calculate its expected value. How does it relate to the population mean? Also, calculate the Standard Error of sample means. How does it relate to the population mean.

- (b) (i) If T is unbiased estimator of β , show that T^2 is a biased estimator of β^2 .

(ii) On what factors does the confidence interval of an estimator depend?

How can you improve the precision of an estimator?

- (c) Define the properties of unbiasedness and efficiency for point estimators.

Use the above properties to comment upon the three estimators.

$$A = \frac{(X_1 + X_2 + X_3)}{3}$$

$$B = \frac{(X_1 + 2X_2 + 3X_3)}{6}$$

$$C = \frac{(2X_1 + X_2 + 4X_3)}{6}$$

for estimating the population mean.

(d) A subdivision of a town has three homes, one with 3 bedroom, one with 4 bedrooms and one with 5 bedrooms. A potential buyer chooses, at random, two different homes to visit (i.e., sampling without replacement).

(i) What is the total number of unique samples?

(ii) Make a sampling distribution of sample totals. What is its expected value? How does it relate to the population mean value?

(iii) What is the probability that the total number of bedrooms in a sample will be at most 9?

2. Attempt any five questions :

(7×5=35)

(a) Consider a normal population distribution with the value of σ known. What

is the confidence level for the interval $(\bar{x} \pm 2.15 \sigma/\sqrt{n})$ and the upper bound

$(\bar{x} \pm 0.84 s/\sqrt{n})$.

(b) A random sample ($n = 100$) is taken from a normally distributed population with mean = 20.0, standard deviation = 1. What is the probability that

(i) $20.0 \leq \bar{X} \leq 20.2$

(ii) $\bar{X} \leq 19$

- (c) Let X denotes no. of hours spent watching television. Further, X is normally distributed with standard deviation of 5 hours. How large sample size is needed so that we can say with 99% confidence that sample mean is within 1 hour from the population mean. How will the sample size be impacted if the confidence level was 90% instead.
- (d) The length of the skulls of 10 fossil skeletons of an extinct species of bird has a mean of 5.68 cm and a standard deviation of 0.29 cm. Assuming that such measurements are normally distributed, find a 95% confidence interval for the mean length of the skulls of this species of bird. Also determine a 94% upper bound.
- (e) Working for a food company, the researcher is asked to determine the average "total fat" (in grams) in a standard package of potato chips. He analyzes 101 packages and get these results: mean = 18.2 g, variance = 0.56 g. If it is assumed that the population of total-fat measurements is normally distributed, find the 90% confidence intervals for standard deviation.
- (f) A study of two kinds of photocopying equipment shows that 61 failures of the first kind of equipment took on the average 80.7 minutes to repair with a standard deviation of 19.4 minutes, whereas 61 failures of the second kind of equipment took on the average 88.1 minutes to repair with a standard deviation of 18.8 minutes. Find a 99% confidence interval for the difference between the true average amounts of time it takes to repair failures of the two kinds of photocopying equipment.

3. Attempt any five questions :

(5×7=35)

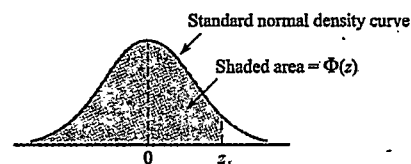
- (a) A random sample of 100 recorded deaths in the United States during the past year showed an average life span of 71.8 years. Assuming a population standard deviation of 8.9 years, does this seem to indicate that the mean life span today is greater than 70 years? Use a 0.05 level of significance. Calculate p value of the test.
- (b) A sample of 16 observations of daily consumption expenditures by a family provided a mean of Rs. 260 and a sample standard deviation of Rs. 25. It is assumed that consumption expenditures are normally distributed. Based on the above data, is it possible to conclude that the average daily expenditure of the family is below 250? Test at 5% and 1% level of significance. Calculate the p value of the test.
- (c) Two production processes are used to produce steel pipes. A sample of 100 pipes is taken from the first production process and has a mean length of 27.3 inches and a standard deviation of 10.3 inches. The corresponding figures for 100 pipes produced by the second method are 30.1 and 5.2 respectively. Is there a significant difference in mean length of pipes produced by the two methods at 1% level of significance. Calculate the p value of the test.
- (d) Two types of chemical solutions, A and B, were tested for their pH (degree of acidity of the solution). Analysis of 6 samples of A showed a mean pH of 7.52 with a standard deviation of 0.024. Analysis of 5 samples of B showed a mean pH of 7.49 with a standard deviation of 0.032. Using a 0.05 significance level, determine whether there is a difference in pH values of the two solutions. Calculate the p value of the test.

- (e) To find out whether the inhabitants of two South Pacific islands may be regarded as having the same racial ancestry, an anthropologist determines the cephalic indices of six adult males from each island, getting $\bar{x}_1 = 77.44$ and $\bar{x}_2 = 72.2$ and the corresponding standard deviations $s_1 = 3.3$ and $s_2 = 2.1$. Use the 0.01 level of significance to see whether the difference between the two sample means can reasonably be attributed to chance. Assume that the populations sampled are normal and have equal variances.
- (f) It is known that body weights of ground squirrels are normally distributed with $\mu = 400$ g and standard deviation = 100 g. The researcher is interested in knowing whether this weight is more variable when the ground squirrels live in more marginal habitats, where the quality and quantity of food vary more from place to place. He randomly selects and weighs 51 ground squirrels from the more marginal habitats and finds the mean to be 350 g, and standard deviation to be 105 g. Does the sample result confirm the hypothesis regarding the weight being more variable for such class of squirrels.

A-6 Appendix Tables

Table A.3 Standard Normal Curve Areas

$$\Phi(z) = P(Z \leq z)$$



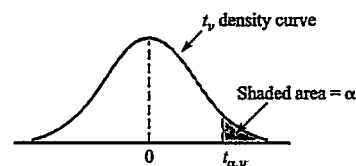
z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
-3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
-3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
-3.2	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005
-3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007
-3.0	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010
-2.9	.0019	.0018	.0017	.0017	.0016	.0016	.0015	.0015	.0014	.0014
-2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
-2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
-2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
-2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
-2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
-2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
-2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
-2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
-2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
-1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
-1.8	.0359	.0352	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
-1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
-1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
-1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
-1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0722	.0708	.0694	.0681
-1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
-1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
-1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
-1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
-0.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
-0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
-0.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
-0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
-0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
-0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
-0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3482
-0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
-0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
-0.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641

(continued)

Table A.3 Standard Normal Curve Areas (cont.)

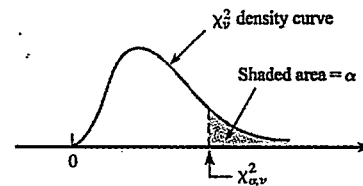
$$\Phi(z) = P(Z \leq z)$$

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9278	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998

Table A.5 Critical Values for t Distributions

ν	α						
	.10	.05	.025	.01	.005	.001	.0005
1	3.078	6.314	12.706	31.821	63.657	318.31	636.62
2	1.886	2.920	4.303	6.965	9.925	22.326	31.598
3	1.638	2.353	3.182	4.541	5.841	10.213	12.924
4	1.533	2.132	2.776	3.747	4.604	7.173	8.610
5	1.476	2.015	2.571	3.365	4.032	5.893	6.869
6	1.440	1.943	2.447	3.143	3.707	5.208	5.959
7	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	1.397	1.860	2.306	2.896	3.355	4.501	5.041
9	1.383	1.833	2.262	2.821	3.250	4.297	4.781
10	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	1.356	1.782	2.179	2.681	3.055	3.930	4.318
13	1.350	1.771	2.160	2.650	3.012	3.852	4.221
14	1.345	1.761	2.145	2.624	2.977	3.787	4.140
15	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	1.337	1.746	2.120	2.583	2.921	3.686	4.015
17	1.333	1.740	2.110	2.567	2.898	3.646	3.965
18	1.330	1.734	2.101	2.552	2.878	3.610	3.922
19	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	1.325	1.725	2.086	2.528	2.845	3.552	3.850
21	1.323	1.721	2.080	2.518	2.831	3.527	3.819
22	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	1.319	1.714	2.069	2.500	2.807	3.485	3.767
24	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	1.316	1.708	2.060	2.485	2.787	3.450	3.725
26	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	1.314	1.703	2.052	2.473	2.771	3.421	3.690
28	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	1.311	1.699	2.045	2.462	2.756	3.396	3.659
30	1.310	1.697	2.042	2.457	2.750	3.385	3.646
32	1.309	1.694	2.037	2.449	2.738	3.365	3.622
34	1.307	1.691	2.032	2.441	2.728	3.348	3.601
36	1.306	1.688	2.028	2.434	2.719	3.333	3.582
38	1.304	1.686	2.024	2.429	2.712	3.319	3.566
40	1.303	1.684	2.021	2.423	2.704	3.307	3.551
50	1.299	1.676	2.009	2.403	2.678	3.262	3.496
60	1.296	1.671	2.000	2.390	2.660	3.232	3.460
120	1.289	1.658	1.980	2.358	2.617	3.160	3.373
∞	1.282	1.645	1.960	2.326	2.576	3.090	3.291

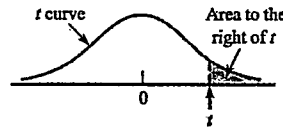
Table A.7 Critical Values for Chi-Squared Distributions



ν	α									
	.995	.99	.975	.95	.90	.10	.05	.025	.01	.005
1	0.000	0.000	0.001	0.004	0.016	2.706	3.843	5.025	6.637	7.882
2	0.010	0.020	0.051	0.103	0.211	4.605	5.992	7.378	9.210	10.597
3	0.072	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.344	12.837
4	0.207	0.297	0.484	0.711	1.064	7.779	9.488	11.143	13.277	14.860
5	0.412	0.554	0.831	1.145	1.610	9.236	11.070	12.832	15.085	16.748
6	0.676	0.872	1.237	1.635	2.204	10.645	12.592	14.440	16.812	18.548
7	0.989	1.239	1.690	2.167	2.833	12.017	14.067	16.012	18.474	20.276
8	1.344	1.646	2.180	2.733	3.490	13.362	15.507	17.534	20.090	21.954
9	1.735	2.088	2.700	3.325	4.168	14.684	16.919	19.022	21.665	23.587
10	2.156	2.558	3.247	3.940	4.865	15.987	18.307	20.483	23.209	25.188
11	2.603	3.053	3.816	4.575	5.578	17.275	19.675	21.920	24.724	26.755
12	3.074	3.571	4.404	5.226	6.304	18.549	21.026	23.337	26.217	28.300
13	3.565	4.107	5.009	5.892	7.041	19.812	22.362	24.735	27.687	29.817
14	4.075	4.660	5.629	6.571	7.790	21.064	23.685	26.119	29.141	31.319
15	4.600	5.229	6.262	7.261	8.547	22.307	24.996	27.488	30.577	32.799
16	5.142	5.812	6.908	7.962	9.312	23.542	26.296	28.845	32.000	34.267
17	5.697	6.407	7.564	8.682	10.085	24.769	27.587	30.190	33.408	35.716
18	6.265	7.015	8.231	9.390	10.865	25.989	28.869	31.526	34.805	37.156
19	6.843	7.632	8.906	10.117	11.651	27.203	30.143	32.852	36.190	38.580
20	7.434	8.260	9.591	10.851	12.443	28.412	31.410	34.170	37.566	39.997
21	8.033	8.897	10.283	11.591	13.240	29.615	32.670	35.478	38.930	41.399
22	8.643	9.542	10.982	12.338	14.042	30.813	33.924	36.781	40.289	42.796
23	9.260	10.195	11.688	13.090	14.848	32.007	35.172	38.075	41.637	44.179
24	9.886	10.856	12.401	13.848	15.659	33.196	36.415	39.364	42.980	45.558
25	10.519	11.523	13.120	14.611	16.473	34.381	37.652	40.646	44.313	46.925
26	11.160	12.198	13.844	15.379	17.292	35.563	38.885	41.923	45.642	48.290
27	11.807	12.878	14.573	16.151	18.114	36.741	40.113	43.194	46.962	49.642
28	12.461	13.565	15.308	16.928	18.939	37.916	41.337	44.461	48.278	50.993
29	13.120	14.256	16.147	17.708	19.768	39.087	42.557	45.772	49.586	52.333
30	13.787	14.954	16.791	18.493	20.599	40.256	43.773	46.979	50.892	53.672
31	14.457	15.655	17.538	19.280	21.433	41.422	44.985	48.231	52.190	55.000
32	15.134	16.362	18.291	20.072	22.271	42.585	46.194	49.480	53.486	56.328
33	15.814	17.073	19.046	20.866	23.110	43.745	47.400	50.724	54.774	57.646
34	16.501	17.789	19.806	21.664	23.952	44.903	48.602	51.966	56.061	58.964
35	17.191	18.508	20.569	22.465	24.796	46.059	49.802	53.203	57.340	60.272
36	17.887	19.233	21.336	23.269	25.643	47.212	50.998	54.437	58.619	61.581
37	18.584	19.960	22.105	24.075	26.492	48.363	52.192	55.667	59.891	62.880
38	19.289	20.691	22.878	24.884	27.343	49.513	53.384	56.896	61.162	64.181
39	19.994	21.425	23.654	25.695	28.196	50.660	54.572	58.119	62.426	65.473
40	20.706	22.164	24.433	26.509	29.050	51.805	55.758	59.342	63.691	66.766

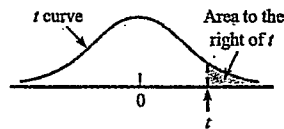
For $\nu > 40$, $\chi^2_{\alpha, \nu} \approx \nu \left(1 - \frac{2}{9\nu} + z_{\alpha} \sqrt{\frac{2}{9\nu}} \right)^3$

A-12 Appendix Tables

Table A.8 t Curve Tail Areas

t	v	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0.0		.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500
0.1		.468	.465	.463	.463	.462	.462	.462	.461	.461	.461	.461	.461	.461	.461	.461	.461	.461	.461
0.2		.437	.430	.427	.426	.425	.424	.424	.423	.423	.423	.422	.422	.422	.422	.422	.422	.422	.422
0.3		.407	.396	.392	.390	.388	.387	.386	.386	.385	.385	.385	.384	.384	.384	.384	.384	.384	.384
0.4		.379	.364	.358	.355	.353	.352	.351	.350	.349	.349	.348	.348	.348	.347	.347	.347	.347	.347
0.5		.352	.333	.326	.322	.319	.317	.316	.315	.315	.314	.313	.313	.313	.312	.312	.312	.312	.312
0.6		.328	.305	.295	.290	.287	.285	.284	.283	.282	.281	.280	.280	.279	.279	.279	.278	.278	.278
0.7		.306	.278	.267	.261	.258	.255	.253	.252	.251	.250	.249	.249	.248	.247	.247	.247	.247	.246
0.8		.285	.254	.241	.234	.230	.227	.225	.223	.222	.221	.220	.220	.219	.218	.218	.218	.217	.217
0.9		.267	.232	.217	.210	.205	.201	.199	.197	.196	.195	.194	.193	.192	.191	.191	.191	.190	.190
1.0		.250	.211	.196	.187	.182	.178	.175	.173	.172	.170	.169	.169	.168	.167	.167	.166	.166	.165
1.1		.235	.193	.176	.167	.162	.157	.154	.152	.150	.149	.147	.146	.146	.144	.144	.144	.143	.143
1.2		.221	.177	.158	.148	.142	.138	.135	.132	.130	.129	.128	.127	.126	.124	.124	.124	.123	.123
1.3		.209	.162	.142	.132	.125	.121	.117	.115	.113	.111	.110	.109	.108	.107	.107	.106	.105	.105
1.4		.197	.148	.128	.117	.110	.106	.102	.100	.098	.096	.095	.093	.092	.091	.091	.090	.090	.089
1.5		.187	.136	.115	.104	.097	.092	.089	.086	.084	.082	.081	.080	.079	.077	.077	.077	.076	.075
1.6		.178	.125	.104	.092	.085	.080	.077	.074	.072	.070	.069	.068	.067	.065	.065	.065	.064	.064
1.7		.169	.116	.094	.082	.075	.070	.065	.064	.062	.060	.059	.057	.056	.055	.055	.054	.054	.053
1.8		.161	.107	.085	.073	.066	.061	.057	.055	.053	.051	.050	.049	.048	.046	.046	.045	.045	.044
1.9		.154	.099	.077	.065	.058	.053	.050	.047	.045	.043	.042	.041	.040	.038	.038	.038	.037	.037
2.0		.148	.092	.070	.058	.051	.046	.043	.040	.038	.037	.035	.034	.033	.032	.032	.031	.031	.030
2.1		.141	.085	.063	.052	.045	.040	.037	.034	.033	.031	.030	.029	.028	.027	.027	.026	.025	.025
2.2		.136	.079	.058	.046	.040	.035	.032	.029	.028	.026	.025	.024	.023	.022	.022	.021	.021	.021
2.3		.131	.074	.052	.041	.035	.031	.027	.025	.023	.022	.021	.020	.019	.018	.018	.018	.017	.017
2.4		.126	.069	.048	.037	.031	.027	.024	.022	.020	.019	.018	.017	.016	.015	.015	.014	.014	.014
2.5		.121	.065	.044	.033	.027	.023	.020	.018	.017	.016	.015	.014	.013	.012	.012	.012	.011	.011
2.6		.117	.061	.040	.030	.024	.020	.018	.016	.014	.013	.012	.012	.011	.010	.010	.010	.009	.009
2.7		.113	.057	.037	.027	.021	.018	.015	.014	.012	.011	.010	.010	.009	.008	.008	.008	.008	.007
2.8		.109	.054	.034	.024	.019	.016	.013	.012	.010	.009	.009	.008	.008	.007	.007	.006	.006	.006
2.9		.106	.051	.031	.022	.017	.014	.011	.010	.009	.008	.007	.007	.006	.005	.005	.005	.005	.005
3.0		.102	.048	.029	.020	.015	.012	.010	.009	.007	.007	.006	.006	.005	.004	.004	.004	.004	.004
3.1		.099	.045	.027	.018	.013	.011	.009	.007	.006	.006	.005	.005	.004	.004	.004	.003	.003	.003
3.2		.096	.043	.025	.016	.012	.009	.008	.006	.005	.005	.004	.004	.003	.003	.003	.003	.003	.002
3.3		.094	.040	.023	.015	.011	.008	.007	.005	.005	.004	.004	.003	.003	.002	.002	.002	.002	.002
3.4		.091	.038	.021	.014	.010	.007	.006	.005	.004	.003	.003	.003	.002	.002	.002	.002	.002	.002
3.5		.089	.036	.020	.012	.009	.006	.005	.004	.003	.003	.002	.002	.002	.002	.002	.001	.001	.001
3.6		.086	.035	.018	.011	.008	.006	.004	.004	.003	.002	.002	.002	.002	.001	.001	.001	.001	.001
3.7		.084	.033	.017	.010	.007	.005	.004	.003	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001
3.8		.082	.031	.016	.010	.006	.004	.003	.003	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001
3.9		.080	.030	.015	.009	.006	.004	.003	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001
4.0		.078	.029	.014	.008	.005	.004	.003	.002	.002	.001	.001	.001	.001	.001	.001	.001	.000	.000

(continued)

Table A.8 *t* Curve Tail Areas (cont.)

<i>t</i>	19	20	21	22	23	24	25	26	27	28	29	30	35	40	60	120	$\infty (=z)$
0.0	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500
0.1	.461	.461	.461	.461	.461	.461	.461	.461	.461	.461	.461	.461	.460	.460	.460	.460	.460
0.2	.422	.422	.422	.422	.422	.422	.422	.421	.421	.421	.421	.421	.421	.421	.421	.421	.421
0.3	.384	.384	.384	.383	.383	.383	.383	.383	.383	.383	.383	.383	.383	.383	.383	.382	.382
0.4	.347	.347	.347	.347	.346	.346	.346	.346	.346	.346	.346	.346	.346	.346	.345	.345	.345
0.5	.311	.311	.311	.311	.311	.311	.311	.311	.311	.310	.310	.310	.310	.310	.309	.309	.309
0.6	.278	.278	.278	.277	.277	.277	.277	.277	.277	.277	.277	.277	.276	.276	.275	.275	.274
0.7	.246	.246	.246	.246	.245	.245	.245	.245	.245	.245	.245	.245	.244	.244	.243	.243	.242
0.8	.217	.217	.216	.216	.216	.216	.215	.215	.215	.215	.215	.215	.215	.214	.213	.213	.212
0.9	.190	.189	.189	.189	.189	.189	.188	.188	.188	.188	.188	.188	.187	.187	.186	.185	.184
1.0	.165	.165	.164	.164	.164	.164	.163	.163	.163	.163	.163	.163	.162	.162	.161	.160	.159
1.1	.143	.142	.142	.142	.141	.141	.141	.141	.140	.140	.140	.140	.139	.139	.138	.137	.136
1.2	.122	.122	.122	.121	.121	.121	.121	.120	.120	.120	.120	.120	.119	.119	.117	.116	.115
1.3	.105	.104	.104	.104	.103	.103	.103	.103	.102	.102	.102	.102	.101	.101	.099	.098	.097
1.4	.089	.089	.088	.088	.087	.087	.087	.087	.086	.086	.086	.086	.085	.085	.083	.082	.081
1.5	.075	.075	.074	.074	.074	.073	.073	.073	.072	.072	.072	.072	.071	.071	.069	.068	.067
1.6	.063	.063	.062	.062	.062	.061	.061	.061	.060	.060	.060	.060	.059	.059	.057	.056	.055
1.7	.053	.052	.052	.052	.051	.051	.051	.051	.050	.050	.050	.050	.049	.048	.047	.046	.045
1.8	.044	.043	.043	.043	.042	.042	.042	.042	.042	.041	.041	.041	.040	.040	.038	.037	.036
1.9	.036	.036	.036	.035	.035	.035	.035	.034	.034	.034	.034	.034	.033	.033	.031	.030	.029
2.0	.030	.030	.029	.029	.029	.028	.028	.028	.028	.027	.027	.027	.027	.026	.025	.024	.023
2.1	.025	.024	.024	.024	.023	.023	.023	.023	.022	.022	.022	.022	.022	.021	.020	.019	.018
2.2	.020	.020	.020	.019	.019	.019	.019	.018	.018	.018	.018	.018	.017	.017	.016	.015	.014
2.3	.016	.016	.016	.016	.015	.015	.015	.015	.015	.015	.014	.014	.014	.013	.012	.012	.011
2.4	.013	.013	.013	.013	.012	.012	.012	.012	.012	.012	.011	.011	.011	.011	.010	.009	.008
2.5	.011	.011	.010	.010	.010	.010	.010	.010	.009	.009	.009	.009	.009	.008	.008	.007	.006
2.6	.009	.009	.008	.008	.008	.008	.008	.008	.007	.007	.007	.007	.007	.007	.006	.005	.005
2.7	.007	.007	.007	.007	.006	.006	.006	.006	.006	.006	.006	.006	.005	.005	.004	.004	.003
2.8	.006	.006	.005	.005	.005	.005	.005	.005	.005	.005	.005	.005	.004	.004	.003	.003	.003
2.9	.005	.004	.004	.004	.004	.004	.004	.004	.004	.004	.004	.003	.003	.003	.003	.002	.002
3.0	.004	.004	.003	.003	.003	.003	.003	.003	.003	.003	.003	.003	.002	.002	.002	.002	.001
3.1	.003	.003	.003	.003	.003	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.001
3.2	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001
3.3	.002	.002	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000
3.4	.002	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000
3.5	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000
3.6	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	.000
3.7	.001	.001	.001	.001	.001	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000
3.8	.001	.001	.001	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
3.9	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
4.0	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

6095

4

6. Write short notes on **any three** :-

- (a) Essentials of a good trademark
 - (b) Parties entitled to apply for a patent
 - (c) One-person company
 - (d) Difference between coercion and undue influence
 - (e) Voting and its types
- (6×3=18)

(700)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6095

J

Unique Paper Code : 2922103602

Name of the Paper : Business Legislation in India

Name of the Course : **B.A. (Hons.) Business Economics (2025)**

Semester : VI

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. This paper contains **six** questions. Attempt any **five** questions.
3. **All** questions carry equal marks.

1. (a) What do you mean by 'capacity to contract'?
Discuss in detail the provisions of law relating to
minor's agreements. (10)

P.T.O.

- (b) Distinguish between valid, voidable, and void contracts. Case: X intending to deceive Y falsely represents that his land produces 20 quintals of wheat per acre, and thereby induces Y to buy the piece of land. Y wants to avoid the agreement under the plea that he has been defrauded. Will he succeed? Give reasons for your answer. (8)
2. (a) Define an unpaid seller. Explain the rights of an unpaid seller under the Sale of Goods Act. (10)
- (b) Distinguish between sale and agreement to sell. Give examples. (8)
3. (a) Discuss the grounds for winding up by the Tribunal. What are the consequences of the winding up order by the Tribunal? (10)
- (b) "A stranger to a contract cannot sue." Discuss. Are there any exceptions to this rule? Explain. (8)

4. (a) "The Board of Directors of a company can do all such acts and exercise all such powers as the company itself may do or exercise." Discuss this statement. Are there any restrictions on the powers of the board of Directors? (10)
- (b) What is a Memorandum of Association? State the provisions of Company Law regarding alteration of registered office and object clause of the Memorandum of Association. (8)
5. (a) Discuss the remedial machinery for the speedy redressal of consumer disputes under the Consumer Protection Act 1986. (10)
- (b) What are the powers and functions of the Competition Commission of India under the Competition Act 2002 ? Discuss. (8)

6150

4

7. Write short notes on any **three** of the following :

(a) Environmental Damage

(b) Tradable Allowance System

(c) Pigouvian Tax

(d) IPAT Identity (6×3=18)

(1000)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6150

J

Unique Paper Code : 2922103603

Name of the Paper : Environmental Economics

Name of the Course : **B.A. (Hons) Business
Economics (NEP)**

Semester : VI

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **FIVE** questions.
3. Illustrate your answer with suitable diagrams, wherever required.

P.T.O.

1. (a) Explain the major objectives of Environmental Economics. Discuss the Materials Balance Model that illustrates the interaction between economic activity and the natural environment. (9)
- (b) Briefly explain the concept of Sustainable Development as a global objective. (9)
2. (a) What are the causes of ozone depletion? Discuss the global initiatives and agreements aimed at reducing greenhouse gas emissions. (9)
- (b) How can public goods markets be modelled as a form of market failure? (9)
3. (a) Explain the Environmental Kuznets Curve (EKC). Discuss the three major perspectives on its shape and interpretation. (9)
- (b) What are the three types of environmental standards? Evaluate whether these standards are allocatively efficient? (9)

4. The Coase Theorem suggests that under certain conditions, the allocation of property rights can lead to bargaining among affected parties and result in an efficient outcome. Explain the theorem and its implications for environmental policy. (18)
5. (a) What are the three basic types of standards used in environmental control policy? How does the Command-and-Control approach function as a widely adopted strategy to curb pollution? (9)
- (b) Explain the role of deposit-refund systems as a market-based policy instrument for pollution control. (9)
6. What are the major issues associated with climate change? Discuss various international agreements designed to address these challenges. (18)

S.No. of Q. Paper : 9192

Course: B.A. (Hons.) Business Economics

Semester: VI

Paper Title: International Economics

Unique Paper Code: 12481601

Maximum Marks: 75

Duration: 3 hours

Instructions:

1. Write your Roll Number at the top of the answer sheet.
2. Answer any FIVE questions.
3. Diagrams should be used wherever appropriate.

Answer any FIVE of the following questions (Each question carries 15 marks):

1. (a) Explain the concept of comparative advantage and how it leads to gains from trade between nations. How is Ricardo's theory an improvement over Adam Smith's absolute advantage?

(b) Explain with a diagram how increasing opportunity costs influence the shape of the production possibility frontier. Why do countries have different shaped PPFs? (8, 7)
2. (a) Describe the Heckscher-Ohlin model. How do factor endowments determine the pattern of international trade according to this theory?

(b) What is the Leontief Paradox? Discuss at least one explanation for its occurrence. (8, 7)
3. (a) Differentiate between nominal and effective tariff rates. Why is the concept of effective protection important in trade policy?

(b) What is deadweight loss from tariffs? How is it calculated, and what does it signify for economic welfare? (7, 8)
4. (a) Define customs union. What are trade creation and trade diversion effects of forming a customs union?

(b) What is meant by the exchange rate? How is the equilibrium exchange rate determined in a flexible exchange rate regime? (8, 7)
5. (a) How do internal and external economies of scale justify international trade under the New Trade Theory?

(b) Discuss the pros and cons of import substitution and export-oriented industrialization policies. (7, 8)
6. (a) Explain how international trade promotes economic growth. Mention key channels through which this process works.

P.T.O.

(b) How has the WTO responded to contemporary issues such as digital trade, environmental sustainability, and the concerns of developing countries in the 21st century? (7, 8)

7. Write short notes on any three of the following: (5 x 3 = 15 marks)

(i) Factor Price Equalization

(ii) WTO Agreement on Agriculture

(iii) Optimum Tariff

(iv) Intra-industry Trade

(v) Technological Gap Model and Trade

[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : **9277**
Unique Paper Code : 12487915
Name of the Paper : New Venture Planning & Implementation
Name of the Course : **B.A. (H) Business Economics 2023**
Semester : Semester - VI
Duration : 3 Hours
Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **any five** question.
3. All question carry equal marks.

1. Shreya and Riya are currently pursuing final year of graduation in the Business Economics department of University of Delhi. They identified huge problems of locating a good PG accommodation in Delhi, as they both are out-station students. They spotted this opportunity as there was a huge gap in demand and supply. They plan to launch a comprehensive solution for students' PG related problems. Perform a market feasibility study for them and advise whether they should launch this idea in Delhi and later in India. (15)
2. Classify the following products on the basis of type of technology responsible for their success

(1) Ready to Eat Food

P.T.O.

(2) Smart watches

(3) Ear Pods

(3×5=15)

3. Explain the difference between Risk and Uncertainty Analysis. What are the different techniques of Uncertainty Analysis? Explain with the help of an example. (15)
4. Identify and quote examples of two ventures from relevant industries and elaborate the probable reasons of failure of any new business idea. Also, state the essential requirements that contribute to the success of any venture. (15)
5. Discuss in detail various initiatives taken up by the Government of India to build and strengthen Start Up Ecosystem in India. (15)
6. What are the factors you will consider to perform Social Impact Assessment (SIA) in case of construction of a new flyover at Punjabi Bagh, Delhi? (15)
7. Write Short Notes on any three.
 - (a) Estimation of Market Size
 - (b) Un-Conventional sources of funds available for aspiring entrepreneurs
 - (c) Parameters considered by prospective lenders during overall technical assessment
 - (d) Process of launching a new venture in India(3×5=15)

balanced. During the peak sales period in the first week of November, both stores plan to run promotional campaigns via newspaper, radio, or television. The gain in customers for ElectroMart (and corresponding loss for TechHub) depends on the advertising strategies used by both. This gain/loss is summarized in the following payoff matrix (values indicate the gain or loss of customers for ElectroMart):

		TechHub		
		Newspaper	Radio	Television
Electro Mart	Newspaper	30	40	-80
	Radio	0	15	-20
	Television	90	20	50

Determine the optimal advertising strategies for both ElectroMart and TechHub and calculate the value of the game. (9)

6. Short Notes on any **four**: (4.5*4)

- (i) Fundamental Matrix of Markov Chains
- (ii) Pay-off and regret functions
- (iii) Beta Distribution of Activity Times in PERT
- (iv) Saddle Point (Game Theory)
- (v) MODI Method

(1000)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6036

J

Unique Paper Code : 2922103601

Name of the Paper : Operations Research

Name of the Course : **B.A. (H) Business Economics (2025)**

Semester : VI

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll. No. on the top immediately on receipt of this question paper.
2. Attempt **any five** questions.
3. The use of a basic calculator and standard Z Table is permitted for solving relevant questions.
4. If any value is missing in a question, assume a reasonable value, clearly state your assumption, and proceed with the solution accordingly.

P.T.O.

1. (a) A company produces two products, A and B. Each unit of product A consumes 3 kg of raw material and requires 2 labour hours for processing. In comparison, each unit of product B requires 2 kg of raw materials and 3 labour hours. The firm has a daily availability of 70 kg of raw material and 80 labour hours. The profit from selling one unit of product A is Rs 50, while each unit of product B yields a profit of Rs 40. Formulate and solve this as a linear programming problem (LPP) using simplex method to find the optimal number of units of each product that should be manufactured daily in order to maximize profit. (14)

OR

Consider the following problem and optimum table given along with that:

Maximize:

$$Z = x_1 + 4x_2$$

Subject to:

$$2x_1 + 4x_2 \leq 7$$

$$5x_1 + 3x_2 \leq 15$$

$x_1, x_2 \geq 0$, and are integers

Assuming no further changes in consumer buying habits:

1. What will be the market shares of the three brands at the end of the first and second year?
 2. What will be the long-run (steady-state) market shares of Alpha, Beta, and Corex? (9)
5. (a) Write the dual of the following Linear Programming Problem:

Maximize

$$Z = 1600X_1 + 1500X_2 + 3000X_3$$

Subject to:

$$X_1 \leq 500$$

$$X_2 \leq 800$$

$$X_3 \leq 300$$

$$1.5X_1 + 1.5X_2 + 3.0X_3 \leq 4200$$

$$2.0X_1 + 2.0X_2 + 4.0X_3 \leq 3600$$

$$X_1, X_2, X_3 \geq 0$$

(9)

- (b) In a small town, two competing electronics stores- ElectroMart and TechHub - operate and sell similar products at the same price. The local market consists of a fixed number of customers equally divided between the two stores. Both brands enjoy a good reputation, and customer loyalty is fairly

Cakes Demanded	0	1	2	3	4	5
Probability	0.05	0.10	0.20	0.30	0.20	0.15

- (i) How many cakes should the bakery prepare each day to minimize the expected total cost?
- (ii) Calculate the Expected Value of Perfect Information (EVPI)

The owner is considering conducting a local customer survey to better forecast daily demand. What is the maximum amount they should be willing to spend on such a survey? (9)

- (b) Suppose three smartphone brands - Alpha, Beta, and Corex - launched their flagship models at the same time and initially captured equal shares of the market. However, during the first year, customer loyalty and switching trends were observed as follows:

- Alpha retained 90% of its customers, but lost 3% to Beta and 7% to Corex.
- Beta retained 70% of its customers, but lost 10% to Alpha and 20% to Corex.
- Corex retained 80% of its customers, but lost 10% to Alpha and 10% to Beta.

Cj	Basic Variable	Bi	1	4	0	0
			x_1	x_2	S_1	S_2
4	x_2	7/4	1/2	1	1/4	0
0	S_2	39/4	7/2	0	-3/4	1
	Z	7	2	4	1	0

Solve Integer Programming Problem using Gomory's cutting plane algorithm. (14)

- (b) Explain the assumptions of Linear Programming. Critically evaluate how realistic these assumptions are in real-world business situations. (4)

2. (a) A small garment making unit has five tailors stitching five different types of garments. All the five are capable of stitching all five types of garments. The output per day per tailor and the profit (Rs.) for each type of garment are given below:

Tailors	Garments				
	1	2	3	4	5
A	7	9	4	8	6
B	4	9	5	7	8
C	8	5	2	9	8
D	6	5	8	10	10
E	7	8	10	9	9
Profit/Garment (Rs.)	2	3	2	3	4

Which type of garment should be assigned to which tailor to maximize profit? (9)

(b) A product is produced by four factories A, B, C and D. The unit costs of production in these factories are Rs. 2, Rs. 3, Re. 1 and Rs. 5 respectively. The production capacities are:

Factory A-50 units, B- 70 units, C- 30 and D-50 units. These factories supply the product to four stores, 1, 2, 3, 4 the demands of which are 25, 35, 105 and 20 units respectively. Unit transportation costs in rupees from each factory to each store is given in the table below.

Factories	Stores {Unit Transportation Costs (Rs.)}			
	1	2	3	4
A	2	4	6	11
B	10	8	7	5
C	13	3	9	12
D	4	6	8	3

Determine the extent of deliveries from each of the factories to each of the stores so that the total production and transportation cost is minimum. (9)

3. A project consists of following activities with the following relevant information:

Activity	Immediate Predecessor	Estimated Duration (days)		
		Optimistic	Most Likely	Pessimistic
A	-	1	1	7
B	-	1	4	7
C	-	2	2	8
D	A	1	1	1
E	B	2	5	14
F	C	2	5	8
G	D, E	3	6	15
H	F, G	1	2	3

- (i) Find the Project Completion Time.
- (ii) What duration will have 95% confidence for project completion time?
- (iii) If the average duration for activity F increases to 14 days, what will be its effect on the expected project completion time which will have 95% confidence?
- (iv) What is the probability of completing the project by 2 more days than the expected completion time? (6, 4*3).

4. (a) A bakery owner produces gourmet cakes and incurs a storage cost of ₹50 per unsold cake each day. If a customer cannot purchase a cake due to stock-out, they typically go to a competitor, resulting in an estimated lost profit of Rs. 200 per customer. Based on historical data, the probabilities for daily demand of 0 to 5 cakes are as follows:

- (c) What assumptions should be met to conduct the tests mentioned in part (a) above. What are the alternatives available for the two tests if any of the assumptions is not met. (6)
5. (a) Design a questionnaire using a mix of open-ended, close-ended, and multiple-choice questions and scales to conduct a study on "The Influence of Mobile Banking on Consumer Behaviour." (10)
- (b) What are the key elements of a good questionnaire? Explain with examples. (8)
6. (a) A university researcher is preparing a report on the mental health of students. While conducting the literature review, she includes several studies without proper citation and paraphrasing. Some of the referenced materials are outdated. Later, she presents her findings at a seminar without acknowledging co-authors.
- (a) What are the do's and don'ts of conducting a literature review, as highlighted in this case? (6)
- (b) Identify three ethical violations in the research process and suggest corrective measures. (6)
- (c) Explain the importance of referencing and citation in academic writing. (6)

(700)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6215

J

Unique Paper Code : 2923100015

Name of the Paper : Research Methodology (DSE)

Name of the Course : **B.A. (H) Business Economics**

Semester : VI

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
 2. Attempt **five** questions in all. **Q1** is compulsory.
 3. **All** questions carry equal marks.
 4. Use of simple calculator is allowed.
 5. If any assumption is made while solving a problem, the same must be stated clearly.
1. Attempt the following as directed
 - (a) An ongoing study targets different villages in a district. The researcher randomly selects 5 villages and surveys 100 randomly selected households in each of the selected village. Explain which of the following sampling technique can the researcher apply and elucidate the reasons for the selection of technique by the researcher. Also discuss its advantages and disadvantages. (5)

P.T.O.

- (b) Indicate which of the four primary scales should be used to record the following variables. Also mention whether the variable is categorical or numerical. (2×3)

(i) Age of a respondent

(ii) Position of athletes in a 100 m race

(iii) Religion of the respondents

- (c) Explain the following with examples wherever possible. (3.5×2)

(i) Semantic Differential Scale

(ii) Validity of a research instrument

2. An NGO wants to evaluate the effectiveness of a rural employment scheme introduced in 2020. The team begins by defining their objectives and formulating research questions. They plan to use both qualitative interviews with villagers and quantitative analysis of employment data. They hypothesize that the scheme has significantly increased household incomes.

(a) Identify the types of research being used and explain how both support the study. (6)

(b) What are the key elements of a good research design in this case? (6)

(c) Describe how the researchers should formulate and test a hypothesis in this context. (6)

3. A group of economics students is studying consumer spending habits in their city. They plan to collect primary data through online surveys and interview methods. Their questionnaire includes both nominal and ordinal scale questions, including demographic information and rating preferences on a 5-point likert scale.

(a) Explain the types of data being collected with examples from the case. What is the other data collection technique. Explain the difference between the two. (6)

(b) Describe the advantages and disadvantages of both the online survey and interview method. (6)

(c) What are scales of measurement? Identify the types used in this study and justify their application. (6)

4. A pharmaceutical company conducts a study comparing the effectiveness of two different drugs. They collect health scores from 50 patients before and after administering each drug along with information on other parameters. They analyze the data using paired t- test and ANOVA, and later apply PCA to reduce data dimensions.

(a) Explain paired t-test and ANOVA and how both apply here. (6)

(b) Define PCA and its role in this research. (6)