2903N468   Candidate's Seat No :_____

M.Com. (HPP) (Sem.-2) Examination
CC 6
Services Marketing

Time : 2-30 Hours]   March 2019   [Max. Marks : 70

1 (A) What is Customer Perceptions? Discuss customer perceptions of quality and customer satisfaction. (14)

OR

1A(i) What is service marketing? Discuss service marketing mix. (7)
A(ii) What is customer satisfaction? Why is it so important? (7)

1 (B) **Answer in one or two sentences. (Any 4)** (4)
  i.   What is Customer Service?
  ii. What is Customer Expectation?
  iii. What is Customer Perception?
  iv. Define Services?
  v.   What is Perceived Risk?
  vi. What do you mean by Goods?

2 (A) What is service recovery? Explain various service recovery strategies? (14)

OR

2A(i) What is Service scape? Discuss various types of service scape. (7)
2A(ii) What is Relationship marketing? Explain levels of relationship strategies. (7)

2 (B) **Answer in one or two sentences. (Any 4)** (4)
  i.   What is Service Encounter?
  ii. State different types of complainers.
  iii. What is service design?
  iv. What is service blueprinting?
  v.   What is customer defined service standards?
  vi. What is self service technology?

3(A) Explain Gap Model of Service Quality. (14)

OR

3A(i) Explain the strategies for enhancing customer participation. (14)

3 (B) **Answer in one or two sentences. (Any 3)** (3)
  i.   What is Service Triangle?
  ii. What is Service Guarantee?
  iii. What is Empathy?
  iv. What is Service failure?
  v.   What is Defensive Marketing?

4(A) Explain three major ways that service prices differ from goods prices for customers. (14)

OR

4A(i) Explain various approaches for integrating services marketing communication. (7)
4A(ii) Explain approaches to pricing services. (7)

4 (B) **Answer in one or two sentences. (Any 3)** (3)
  i.   What is internal marketing communication?
  ii. What is Service Quality?
  iii. What are Behavioral Intentions?
  iv. What is Interactive Marketing?
  v.   What are Service Promises?

M.Com. (HPP) (Sem.-2) Examination
CC 8
Business Environment (FFS)

Time : 2-30 Hours]   April 2019   [Max. Marks : 70

1.(A). Explain the various types of forecasts undertaken to formulate plans and strategies   **(14)**

OR

1.(A).(i) Discuss the characteristics of a business.   **(7)**

(ii) Explain in detail the classification of a business on the basis of nature of activity **(7)** undertaken by an industry.

1.(B). **Choose the correct option (Any 4)**   **(4)**

(i) The bargaining power of buyers include _____.
(a)Forcing down prices   (b) Demanding higher quality
(c) Demanding more services   (d) All of the above

(ii) Primary activities of value chain does not include _____.
(a)inbound logistics   (b) operations
(c) human resource management   (d) marketing and sales

(iii) Improper implementation of strategy may be due to _____.
(a) adequate resources   (b) wrong assignment of tasks
(c) inefficient employees   (d) wrong implementation

(iv) Which of the below is not considered to be part of basic industry?
(a) Cement   (b) Mining
(c) Electric Cable   (d) Iron and steel

(v) _____are short term milestones that the organizations must achieve.
(a) Vision   (b) Goals
(c) Objectives   (d) Mission

2. (A). Discuss the important factors of Economic Environment.   **(14)**

OR

2.(A).(i) Explain the economic role of Government.   **(7)**

(ii) What is Social Audit? Explain the various methods of Social Audit.   **(7)**

2.(B). **Choose the correct option (Any 4):**   **(4)**

(i) _____is the process of analyzing the environment for identification of various factors which have implications for business.
(a) Monitoring   (b) Forecasting
(c) Scanning   (d) Assessment

(ii) _____is a technique to forecast occurrence of complex environmental events.
(a) Scenario Analysis   (b) Trend Extrapolation
(c) Premising Analysis   (d) Econometric Analysis

(iii) _____ is Government's strategy with respect to public expenditure and revenue.
(a) Monetary Policy   (b) Fiscal Policy
(c) Foreign Exchange Policy   (d) Industrial Policy

(iv) _____are products which are mere limitations of competitor's products and may not succeed in market.
(a) Technological dog products
(b) Better mousetrap no one wanted
(c) The me-too products meeting a competitive brick wall
(d) Competitive one-upmanship

P. T. O.

(v) _____ is that level of technological transfer wherein imported technologies are adopted and improved.

(a) Adaptive Level (b) Innovative Level
(c) Duplicative Level (d) Operational Level

3.(A). Explain in detail various types of Companies. (14)

OR

3.(A).(i) Discuss the limitations and problems of trade unionism in India. (7)
(ii) What are quality circles? Explain the structure of organization of quality circles. (7)
3.(B). **Choose the correct option (Any 3):** (3)
(i) _____ is a fundamental document of a company.

(a) Articles of Association (b)Memorandum of Association
(c) Annual Report (d)Prospectus of Company

(ii) _____ is not a cause of industrial dispute due to conflict of interest.

(a) Demand of High Wages (b) Property rights of Workers
(c) Human Rights of Workers (d) Security aspirations of Workers

(iii) Which of the following is a function of trade union?

(a) Secure fair wages for workers
(b) Improve opportunities for promotion
(c) Improve working condition
(d) All of the above

(iv) Settlement of Disputes through Voluntary arbitration is advantageous because_____.

(a) it is less time consuming (b) it is less expensive
(c) it promotes collective bargaining (d) All of the above

4.(A). Explain how Cultural Environment affects the business environment of an international business. (14)

OR

4.(A).(i) Write a note on European Union. (7)
(ii) Write a note on UNCTAD. (7)
4.(B). **Choose the correct option (Any 3):** (3)
(i) The basis of _____ is tradition, past practices and legal precedent set by courts through implementation of statutes, legal legislation and past rulings.

(a) Code Law (b) Common Law
(c) Theocratic Law (d) Autocratic Law

(ii) Which of the following statements signifies Population Explosion?

(a) High Birth rate and Low Death rate (b) High Birth rate and High Death rate
(c) Low Birth rate and Low Death rate (d) Low Birth rate and High Death rate

(iii) _____ is a feeling of confusion, insecurity and anxiety caused by strangeness of new environment.

(a) Cultural Conformity (b) Cultural Adoption
(c) Cultural Shock (d) Cultural Lag

(iv) The full form of NAFTA is _____.

(a)North American Free Trade Agreement
(b) North Atlantic Free Trade Agreement
(c) North African Free Trade Agreement
(d) North Asian Free Trade Agreement

2

M.Com. (HPP) (Sem.-2) Examination
CC 7
Business Policy (FFS)

Time : 2-30 Hours]

March 2019

[Max. Marks : 70

Q-1 a   Describe the steps of Strategic Management Process.   (14)

OR

Q-1 a (i)   Describe the various levels of strategy along-with their characteristics.   (07)

Q-1 a(ii)   Define Vision Statement. What are its characteristics?   (07)

Q-1 b   **Choose the correct option from the following and re-write the correct answer: (Any Four)**   (04)

1   _____level strategies are top management's overall plan for the entire organization and its strategic business units.

a. Business   b. Corporate

c. Functional   d. Operational

2   The hierarchy of _____ lays the foundation for the strategic management of any organization.

a. Strategic intent   b. Strategic fit

c. Strategic leverage   d. Strategic policy

3   The word tactic is most likely to be associated with _____

a. Corporate strategy   b. Operational Strategy

c. Functional Strategy   d. Business Strategy

4   The fundamental purpose for the existence of any organization is described by its _____.

a. Policies   b. Mission

c. Procedures   d. Plans

5   A strategy is a(n) _____

a. Set of opportunities in the marketplace   b. Action plan to achieve the mission

c. Set of threats   d. Capacity

6   _____ denotes what an organization hopes to accomplish in a future period of time.

a. Goals   b. Mission

c. Vision   d. Stucture

Q-2 a   Define the concept of Environment. Discuss the eight environmental sectors.   (14)

OR

Q-2 a(i)   Enumerate the advantages of Concentration strategy.   (07)

Q-2 a(ii)   What do you understand by cost leadership strategy?   (07)

Q-2 b   **Choose the correct option from the following and re-write the correct answer: (Any Four)**   (04)

1   _____ includes radio, television, and internet as the sources of information for environmental scanning.

a. Documentary evidence   b. Mass media

c. Personal media   d. Outdoor media

2   Sources of funds, usage of funds and management of funds will fall under _____ factors.

a. Marketing   b. Financial

c. HRM   d. Production

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3   A _____ is an inherent limitation or constraint which creates a strategic disadvantage for an organization.

a. Strength   b. Weakness

c. Opportunities   d. Threats

4   _____ is an idea that the whole is greater or lesser than the sum of its parts.

a. Goal   b. Dysergy

c. Synergy   d. Plan

5   _____ is special quality possessed by an organization that makes it withstand the pressures of competition in the market place.

a. Competency   b. Dysergy

c. Balance scorecard   d. OCP

6   Economies of scale in production and sale of products leads to _____ costs for the existing firm.

a. Lower   b. Higher

c. Upper   d. Medium

Q-3 a   Describe the process of strategic choice.   (14)

OR

Q-3 a(i)   Discuss the subjective factors in strategic choice.   (07)

Q-3 a(ii) Write a note on contingent strategies.   (07)

Q-3 b   **Choose the correct option from the following and re-write the correct**   (03)
              answer: (Any Three)

1   A _____ is a set of interlinked value-creating activities performed by an organization.

a. Balanced scorecard   b. Value chain

c. VRIO   d. Competitive Analysis

2   A _____ is a reference point for taking measures against the best practices anywhere in any organization.

a. Structure   b. Benchmark

c. Policy   d. Plan

3   Under environmental scanning, _____ are the current concerns that arise in response to events and trends.

a. Operations   b. Issues

c. Functions   d. Benchmarks

4   _____; in the context of an organization's resources can provide competitive advantage because it is difficult to copy.

a. Reputation   b. Issues

c. Events   d. Trends

5   _____ factors are based on one's personal judgment, collective or descriptive factors.

a. Objective   b. Subjective

c. Complex   d. Simple

Q-4a   Elaborate on the various types of Organization Structures.   (14)

OR

Q-4 a(i)   List down the barriers in strategy implementation.   (07)

Q-4 a(ii) Define Structure. List down the characteristics of Vertical Structure.   (07)

Q-4 b   **Choose the correct option from the following and re-write the correct**   (03)
              answer: (Any Three)

1   _____ form of organization structure is appropriate for an organization that is owned by one person.

a. Entrepreneurial   b. Matrix

c. Functional   d. Vertical

2   An Organizational _____ is a series of actions undertaken to achieve a predetermined result.

a. System   b. Process

c. Result   d. Behaviour

3   The _____ structure is designed for coordination and collaboration of work among the peers of the organization.

a. Horizontal   b. Vertical

c. Tall   d. Medium

4   _____lies at the bottom of the pyramid of the strategy activation.

a. Strategy   b. Policies, procedures and rules

c. Competition   d. Plan

Organizations are _____ entities.

5   a. Complex   b. Simple

c. Superb   d. Orthodox

———— ✗ ————

0204N024   Candidate's Seat No :_____

M.Com. (HPP) (Sem.-2) Examination
CC 9
Security Analysis & Portfolio Management (FFS)

Time : 2-30 Hours]   April 2019   [Max. Marks : 70

1(A)   Differentiate Investment Vs. Speculation and Investment Vs. Gambling   (14)

OR

1A (i)   What is investment management? Explain investment management process.   (07)

1A (ii) Explain equity share capital with its advantages and limitations.   (07)

1 (B)   Multiple Choice Questions.   (04)

1.   Which of the following is not a money market instrument?

(a) Treasury Bill   (b) Commercial Paper

(c) Preferred Stock   (d) Certificate of Deposit

2.   If generally interest rates in nation increase, a corporate bond with a fixed interest rate will usually

(a) increase in value   (b) remain unchanged

(c) decrease in value   (d) be returned to corporation

3.   Which of the following is not characteristic of money market?

(a) Liquidity   (b) Marketability

(c) Low risk   (d) Maturity greater than 1 year

4.   Which asset class is a fixed interest investment?

(a) Debt   (b) Equity

(c) Commodities   (d) Real Estate

2 (A)   Explain random walk theory and different forms of Efficient Market Hypothesis.   (14)

OR

2A (i)   Give difference between Forwards and Futures contracts.   (07)

2A (ii) What is technical analysis? Explain principles of Dow theory.   (07)

2(B)   Multiple Choice Questions.   (04)

1.   Which of the following is not a part of the candlestick chart?

(a) Opening price   (b) Volume of trading

(c) Closing price   (d) High and Low price

2.   When opening and closing price is same in candlestick then it is known as _____

(a) Harami   (b) Doji

(c) Marubozu   (d) Hammer

3.   Technical analysis reflects the idea that stock prices _____

P. T. O.

(a) moves upward over time   (b) moves randomly

(c) moves inversely over time   (d) moves in trend

4.   Which of the following is not part of technical analysis?

(a) Support level   (b) P/E Ratio

(c) Candlestick   (d) Charts

3(A)   Attempt any two: (14)

1.   Compute Sharpe ratios, Treynor ratios, and Jensen's alphas for portfolios *A*, *B*, and *C* based on the following returns data, where *M* and *F* stand for the market portfolio and risk-free rate, respectively:

Portfolio	R_p	σ_p	β_p
A	10%	30%	0.75
B	15%	25%	1.00
C	20%	40%	1.50
M	15%	15%	1.00
F	5%	0%	0.00

2.   From the data given below, obtain the expected returns, standard deviation of returns and Correlation coefficient between the returns of Stock A and Stock B.

I	R_A	R_B	p_i
1	0.25	0.45	0.20
2	0.10	0.05	0.50
3	-0.10	-0.15	0.30

3.   An equally weighted portfolio will consist of shares from AB company and YZ company stock. The expected returns and standard deviations associated with AB company stock are 15% and 20% respectively and those for YZ company stock are 10% and 15% respectively. Find the expected return and standard deviation of returns of this portfolio if returns on the two stocks are: (1) perfectly positively correlated (2) perfectly inversely correlated (3) Independent.

OR

3A (i)   Explain Markowitz Portfolio theory.   (07)

3A (ii)   Explain in detail Sharpe's approach to Portfolio construction.   (07)

3(B)   Multiple Choice Questions.   (03)

1.   There is a relationship between risk and return

(a) when risk decreases, return increases

(b) when risk decreases, return is unchanged

(c) when risk increases, return decreases

(d) when risk increases, return increases

2.   Individuals or companies that prefer low-risk, low-return investments are

(a) risk averse   (b) risk neutral   (c) risk lovers   (d) risk takers

3. An important portfolio theory was developed in 1952 by

(a) William Sharpe (b) Markowitz   (c) Merton Black   (d) Ross Levin

4(A) Explain CAPM model with its assumptions and find out expected rate of return for the following security details as per CAPM model.   (14)

Risk free rate of Interest (R_f)   = 6.6%

Rate of return of Index (R_m)   = 12%

Beta of security (β)   = 1.8

OR

4A (i) Difference between SML and CML.   (07)

4A (ii) Write a note on Arbitrage Pricing Theory.   (07)

4(B) Multiple Choice Questions.   (03)

1. Beta for a Market Portfolio is always_____.
(a) -1   (b) 0
(c) +1   (d) greater than one

2. According to the CAPM, what is the rate of return of a portfolio with a beta of 1?

(a) Between R_m and R_f (b) The Risk Free rate, R_f

(c) β (R_m – R_f)   (d) The Return on the market, R_m

3. Which of the following is on the horizontal axis of the Capital Market Line?

(a) Standard Deviation   (b) Beta

(c) Expected Return   (d) Required Return

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

0304N033   Candidate's Seat No :_____

M.Com. (HPP) (Sem.-2) Examination
CC 10
Human Resource Management (FFS)

Time : 2-30 Hours]   April 2019   [Max. Marks : 70

Q-1 (A) Discuss the concept of Human Resource Management and explain Environmental Scanning

Process in detail.   (14)

OR

Q-1 (A) (i) Explain factors influencing Ethical Behavior at work.   (7)

(ii) Distinguish between International HRM and Domestic HRM.   (7)

Q-1 (B) Choose the correct option. (Any Four)   (4)

(1) Human Resource Management is _____

(a) A line function   (b) A staff function

(c) A line, staff and accounting function   (d) All of the above

(2) The _____ and control systems should be altered to support the strategic human resource

Function.

(a) Reward   (b) Appointment

(c) Job allotment   (d) Pension

(3) From the following, which is concerned with fairness of relationship between superior and

subordinates?

(a) Descriptive Ethics   (b) Normative Ethics

(c) Interpersonal Ethics   (d) None of the above

(4) _____ has provided a set of International Standards for ethical practices for Multinational

Companies.

(a) Indian Labour Law   (b) Labour Unions

(c) Central Government   (d) International Labour Organization

P.T.O

1

(5) In which approach, a company chooses citizens of only Parent country to work in Host

nations.

(a) Geocentric   (b) International

(c) Ethnocentric   (d) polycentric

(6) Measuring the environment by opportunities and Threats is defined as:

(a) Environmental changes   (b) Environmental scanning

(c) Environmental Audit   (d) None if these

Q-2 (A) Define the term Recruitment Policy" and discuss the factors governing the Recruitment

Policy in detail.   (14)

OR

Q-2 (A) (i) Explain various types of Orientation.   (7)

(ii) Write a note on Career Guidance.   (7)

Q-2 (B) Choose the correct option. (Any Four)   (4)

(1) From the following, which is considered as a Strategic Activity?

(a) Recruitment   (b) Planning

(c) Productivity   (d) All of these

(2) Campus Recruitment does not have advantage of _____.

(a) High Intellectual capacity   (b) High level of curiosity

(c) High potential   (d) Higher understanding of organization

(3) In an organization initiating career planning, the career path model would essentially

form the basis for:

(a) Placement   (b) Transfer

(c) Rotation   (d) All of above

(4) Selection of the candidates is done out of:

(a) Target population   (b) Internal sources

(c) External sources   (d) Internal as well External sources

2

(5) From the following, which test measure the latent talents of a candidate?

    (a) Achievement Test   (b) Aptitude Test

    (c) Ability Test   (d) personality Test

(6) Step wise process of imparting training to employee is called:

    (a) Job Evaluation   (b) Job Enrichment

    (c) Job Instruction Training   (d) Job Rotation

Q-3 (A) Define Performance Evaluation and Elaborate various types of Evaluators for

conducting performance valuation.   (14)

<div align="center">OR</div>

Q-3(A) (i) Discuss different Kinds of Pay Structure.   (7)

    (ii) Write a note on statutory Welfare Facilities of employees.   (7)

Q-3 (B) Choose the correct option: (Any Three)   (3)

    (1) _____ is defined as the record of outcomes produced on a specific job function

or activity during specific time period.

    (a) Work Function   (b) Evolution

    (c) Well – being   (d) Performance

    (2) _____ is the personal activity by which the enterprise determines the extent of

Employee's job effectiveness.

    (a) Performance evaluation   (b) Job evaluation

    (c) Work evaluation   (d) Promotion

    (3) A/An _____ is a plan or programmes to motivate individual or group

performance.

    (a) Promotion scheme   (b) Incentive scheme

    (c) Reward   (d) Evaluation

    (4) The _____ provides the essential information on which each job is evaluated.

    (a) Job ranking   (b) Job Enlargement

    (c) Jon enrichment   (d) Job description

<div align="right">P.T.O</div>

(5) 360- degree Feedback Method enhances the quality of _____ decisions.

    (a)HR   (b) Management

    (c) HRD   (d) All of above

Q-4 (A) What is meant by the word "Industrial Disputes"? Explain the causes of Industrial Disputes in detail.   **(14)**

<div align="center">OR</div>

Q-4 (A) (i) What are the different levels covered by the HR Audit in an organization?   **(7)**

    (ii) Explain the essentials of a Good Grievance Process.   **(7)**

Q-4 (B) Choose the correct option. (Any Three)   **(3)**

    (1) Moving employees from one job to another in a predetermined way is called:

        (a) Job enrichment   (b) Job rotation

        (c) Job reengineering   (d) Work mapping

    (2) During the lay off period, the employer has to pay ___ of the basic wages.

        (a) Half   (b) One forth

        (c) Three forth   (d) One third

    (3) Relationship between employer and employee is referred to:

        (a) Employer relations   (b) Commercial relations

        (c) Industrial relations   (d) None of the above

    (4) As per Factories Act, 1948, appointment of welfare officer is compulsory in factory having more than how many workers?

        (a) 300   (b) 200

        (c) 400   (d) 500

    (5) An unauthorized strike violating labour agreement is called as:

        (a) Pen down strike   (b) hunger strike

        (c)Sympathy Strike   (d) Wild-cat strike

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0304M0080   Candidate's Seat No :_____

M.Com. (Sem.-2) Examination
EC 411
Statistics (Probability Theory and Probability Distribution)

Time : 2-30 Hours]   April 2019   [Max. Marks : 70

સૂચના : (૧) બધા જ પ્રશ્નો ફરજિયાત છે.

(૨) જમણી બાજુના અંક ગુણ દર્શાવે છે.

1 (a) નીચેનાનાં જવાબ લખો :

    (i) સંભાવનાનાં જુદાં જુદાં પ્રકારો યોગ્ય ઉદાહરણ સહિત વર્ણવો.   7

    x વર્ષની ઉંમરવાળી કોઈ એક વ્યક્તિ એક વર્ષમાં ગુજરી જાય તેની સંભાવના p છે. તો x વર્ષની ઉંમરવાળી n વ્યક્તિઓ પૈકી ઓછામાં ઓછી એક વ્યક્તિ એક વર્ષ દરમિયાન ગુજરી જાય તેની સંભાવના શોધો.

    (ii) સંભાવનાનો ગુણાકારનો નિયમ જણાવો.   7

    એક ફેક્ટરીનાં ત્રણ જુદાં જુદાં વિભાગોમાં અનુક્રમે 2%, 3% અને 5% એકમો ખામીવાળા ઉત્પાદિત થાય છે. તે વિભાગોમાં ઉત્પાદન 2:5:3નાં પ્રમાણમાં થાય છે. કુલ ઉત્પાદનમાંથી એક વસ્તુ યાદચ્છિક રીતે પસંદ કરવામાં આવે છે :

    (a) તો તે વસ્તુ ખામી-રહિત હોઈ તેની સંભાવના મેળવો.

    (b) જો પસંદ કરેલ એકમ ખામીવાળો હોય તો તે પ્રથમ વિભાગ અથવા ત્રીજા વિભાગમાં ઉત્પાદિત થયો હોય તેની સંભાવના મેળવો.

અથવા

    (i) સંભાવનામાં બેઈઝનો અભિગમ ચર્ચો. તે સંભાવનાનો પારંપરિક અભિગમથી કઈ રીતે   7

    અલગ પડે છે? તેમજ બેઈઝનું પ્રક્ષેપ પણ લખો.

    (ii) યોગ્ય ઉદાહરણ દ્વારા સંભાવનાની જુદી જુદી વ્યાખ્યાઓની સરખામણી કરો તેમજ તેની   7

    મર્યાદાઓ પણ જણાવો.

(b) નીચેના ત્રણ પૈકી કોઈપણ બેનાં જવાબ લખો :   4

    (i) કોઈપણ ત્રણ ઘટનાઓ A, B અને (માટે સાબિત કરો) :

$$P(A \cap B \cap C) = P(A) \times P(B/A) \times P[C/(A \cap B)]$$

    (ii) જો A અને B બે સ્વતંત્ર ઘટનાઓ હોય તો સાબિત કરો કે તેમની પૂરક ઘટનાઓ પણ સ્વતંત્ર ઘટનાઓ હોય છે.

    (iii) પરસ્પર નિ:શેષ અને નિવારક હોય તેવી ઘટનાનું એક ઉદાહરણ આપો.

[P.T.O.

૨ (a) નીચેનાનાં જવાબ લખો :

   (i) યોગ પ્રઘાત સર્જક વિધેયની વ્યાખ્યા આપો. તેમજ પ્રઘાતોનાં સંદર્ભમાં પ્રથમ ચાર યોગ   7
પ્રઘાતો મેળવો.

   (ii) એક સતત ચલ x નું સંભાવના વિધેય નીચે પ્રમાણે છે.   7

$$f(x) = b.e^{-b(x-a)} \;\; ; \;\; a \leq x < \infty ; \;\;\; b > 0$$

તો સાબિત કરો કે $\beta_1 = 4$ અને $\beta_2 = 9$.

અથવા

   (i) યાદચ્છિક ચલની વ્યાખ્યા આપો તેમજ ગાણિતીય અપેક્ષાની પણ વ્યાખ્યા આપી તેનાં   7
ગુણધર્મો જણાવો.

   (ii) ચલ x અને y નું દ્વિચલીય સંભાવના વિતરણ નીચે પ્રમાણે છે :   7

			Y	
X	1	2	3	4
1	4/36	3/36	2/36	1/36
2	1/36	3/36	3/36	2/36
3	5/36	1/36	1/36	1/36
4	1/36	2/36	1/36	5/36

તો (a) ચલ x અને y નાં સીમાંત વિતરણો (Marginal Distributions) મેળવો.

   (b) જ્યારે y = 1 હોય ત્યારે ચલ x નું શરતી વિતરણ મેળવો.

   (c) જ્યારે x = 2 હોય ત્યારે ચલ y નું શરતી વિતરણ મેળવો.

   (d) $P(x < 1, v \leq 4)$

   (e) $Cov(x, y)$.

(b) નીચેના ત્રણ પૈકી કોઈપણ બેનાં જવાબ લખો :   4

   (i) ગુણધર્મ વિધેય (Characteristic function)ની વ્યાખ્યા આપી તેનાં લક્ષણો જણાવો.

   (ii) સાદી અને કેન્દ્રિય પ્રઘાતોની વ્યાખ્યા આપો.

   (iii) જો n અનભિનવ પાસાઓને એક સાથે ઉછાળવામાં આવે તો તેમના પર મળતા અંકોનાં સરવાળાની અપેક્ષિત કિંમત મેળવો.

૩ (a) નીચેનાનાં જવાબ લખો :

    (i) બર્નોલી પ્રયત્નની વ્યાખ્યા આપો તેમજ દ્વિપદી વિતરણનો મધ્યક અને વિચરણ મેળવો.   7

    (ii) ઋણ દ્વિપદી વિતરણની વ્યાખ્યા આપો. યોગ્ય ઉદાહરણ સહિત સમજાવો કે તે દ્વિપદી   7
         વિતરણથી કઈ રીતે અલગ પડે છે?

અથવા

    (i) બહુપદી વિતરણ (Multinomial Distribution)ની વ્યાખ્યા આપો તેમજ તેનો મધ્યક,   7
         વિચરણ અને સહવિચરણ પણ મેળવો.

    (ii) એક બોક્ષમાં 12 વસ્તુઓ છે જેમાંથી 5 વસ્તુઓ ખામીવાળી છે. એક વ્યક્તિ તે બોક્ષમાંથી
         એક પછી એક પૂરવણી રહિત પાંચ વસ્તુઓ યાદચ્છિક રીતે પસંદ કરે છે તો નીચેની
         સંભાવનાઓ મેળવો :

         (1) એકપણ એકમ ખામીવાળો ન પસંદ થાય.

         (2) પસંદ કરેલ તમામ એકમો ખામીવાળા હોય

         (3) ઓછામાં ઓછા બે એકમો ખામી વગરનાં હોય.

         તેમજ ખામીવાળા એકમોનો મધ્યક અને વિચરણ પણ મેળવે.

(b) નીચેના પાંચ પૈકી કોઈપણ ત્રણનાં જવાબ લખો :   3

    (i) એક ફેક્ટરીમાં ઉત્પાદિત થતા એકમો પૈકી દશ ટકા એકમો ખામીવાળા હોય છે. યદચ્છિક
         રીતે એકમ પસંદ કરી તેનું પરિક્ષણ કરવામાં આવે છે તો ત્રીજા પ્રયત્ને વ્યક્તિને પ્રથમ
         ખામી રહિત એકમ મળે તેની સંભાવના શોધો.

    (ii) એક વ્યક્તિની નિશાન વિંધવાની શક્યતા 60% છે તો આઠમાં પ્રયત્ને ચોથી વખત
         નિશાન વિંધાય તેની સંભાવના શોધો.

    (iii) પોવશન વિતરણ માટે મધ્યક અને વિચરણ વચ્ચે શું સંબંધ છે?

    (iv) દ્વિપદી વિતરણ અને અતિ-ગુણોત્તર વિતરણમાં ઉપયોગ વચ્ચેનો તફાવત જણાવો.

    (v) અસતત સંભાવના વિતરણની વ્યાખ્યા આપો.

૪ (a) નીચેનાનાં જવાબ લખો :

    (i) કોચી વિતરણ (Cauchy distribution)ની વ્યાખ્યા આપી તેનાં મધ્યક અને વિચરણ મેળવો. 7

    (ii) બીટા--II વિતરણની વ્યાખ્યા આપી તેના મધ્યક અને વિતરણ મેળવો.   7

અથવા

    (i) પ્રમાણ્ય વિતરણનાં મધ્યક અને વિચરણ મેળવો.   7

    (ii) x^2 વિતરણની વ્યાખ્યા આપો અને તેનાં મધ્યક અને વિચરણ મેળવો.

(b) નીચેના પાંચ પૈકી કોઈપણ ત્રણનાં જવાબ લખો :   3

    (i) સ્ટુડન્ટ-t વિતરણની વ્યાખ્યા આપો.

    (ii) વિબુલ (Weibull) વિતરણનું સંભાવના વિતરણ વિધેય લખો.

    (iii) નિદર્શન વિતરણની વ્યાખ્યા આપો.

    (iv) સમષ્ટિનો બે મધ્યકો વચ્ચે સાર્થક તફાવત છે કે નહિ તે જાણવા માટે લઘુ-નિદર્શ
         પરિક્ષણમાં ક્યું વિતરણ ઉપયોગમાં આવે છે?

    (v) ગુણધર્મો સ્વતંત્ર છે કે, નહિ તેનાં પરિક્ષણમાં કયાં વિતરણનો ઉપયોગ થાય છે?

P.T.૯

411 EC: Probability Theory and Probability Distributions
April 2019

Notes:
1. Figures to the right indicate marks of each question.
2. Use of Scientific Calculator is permitted.
3. Statistical Tables will be provided on request.

Q.1

(A) Answer the followings
  (i) Explain various types of probability with suitable illustrations. 7
  If p is the probability that a man of age x year will die within a year. Find the probability that out of n men of age x years at least one will die within a year. 7

  (ii) Give multiplication rule on probability.
  If the chances of defective production in three section of a factory are 2%, 3% and 5% respectively. The production of a commodity is carried out in the ratio 2:5:3. A unit of a commodity is selected at random from the total production.
  (a) Find the probability that non-defective unit is selected.
  (b) If the selected unit is found defective then what is the probability that it was produced in section one or three?

OR

  (i) Explain Bayesian Approach to probability. How does it differ from Classical approach? Also state Bayes Theorem. 7
  (ii) Compare various definitions of probability with suitable illustrations. Also state their limitations 7

(B) Answer any two out of the given three 4
  1. For any three events A, B and C prove that
$$P(A \cap B \cap C) = P(A) \times P(B/A) \times P(C/(A \cap B))$$
  2. If A and B are two independent events then prove that their complements are also independent events.
  3. Give one example of mutually exclusive and exhaustive events

Q.2

(A) Answer the followings

(i) Define Cumulant Generating function. Also derive the first four Cumulants in **7** terms of moments.

(ii) The probability distribution of a continuous random variable x is given below: **7**
$$f(x) = be^{-b(x-a)} \; ; a \leq x < \infty, b > 0$$
Then prove that $\beta_1 = 4$ and $\beta_2 = 9$

OR

(i) Define a Random Variable. Also define Mathematical Expectation. Also state **7** the properties of Mathematical Expectation.

(ii) Consider the following Bivariate Probability Distribution of X and Y, find : **7**

X	1	2	3	4
1	4/36	3/36	2/36	1/36
2	1/36	3/36	3/36	2/36
3	5/36	1/36	1/36	1/36
4	1/36	2/36	1/36	5/36

(a) The marginal distributions of X and Y.
(b) Conditional distribution of X given the value of $y = 1$
(c) Conditional distribution of Y given the value of $x = 2$
(d) $P(x < 1, y \leq 4)$
(e) $Cov(x, y)$

(B) Answer any two out of the given three **4**
1. Define Characteristic function and state its properties.
2. Define raw moments and central moments
3. Is n unbiased dice are thrown together then find the expectation of the sum of the digits on dice.

Q.3

(A) Answer the followings
(i) Define Bernoulli trial. Also obtain mean and variance of binomial distribution **7**
(ii) Define negative binomial distribution. By taking appropriate illustration **7** explain how it differs from binomial distribution.

OR

(i) Define Multinomial Distribution and derive its Means, Variances and Co **7** variances
(ii) A box contains 12 items of which 5 are defective. A person selects five item **7** one by one without replacement from the box. Find the probabilities that
    (a) None of the item selected is defective
    (b) All selected items are defective
    (c) At least two of the selected items are non-defective.
    Find mean and variance of defective items

(B) Answer any three out of the given five **3**
1. Ten percent of the product produced in a factory are defective. If products are randomly selected one at a time and tested, what is the probability that the first non-defective product will be found on the third trial?
2. There are 60% chances that a person can aim a target successfully. What are the chances that he has fourth success at the 8 trial?
3. What is the relation between mean and variance for Poisson distribution?
4. Give difference between the application of Binomial distribution and Hyper geometric distribution?
5. Define discrete probability distribution.

Q.4

(A) Answer the followings
(i) Define Cauchy distribution and obtain its mean and variance. **7**
(ii) Define Beta-II Distribution and obtain its mean and variance. **7**

OR

(i) Obtain mean and variance of normal distribution. **7**
(ii) Define χ^2 distribution and obtain its mean and variance **7**

(B) Answer any two out of the given three **3**
1. Define student's t-distribution
2. Write pdf of Weibull distribution.
3. Define sampling distribution.
4. To test significant difference between two populations means in the case of small samples, which distribution is used?
5. To test independency of attributes which distribution is used?

—V—