Course Code	Course Name	Category	L	T	P	Credit
20MBA291	SYSTEM ANALYSIS AND DESIGN	Elective	3	0	0	3

Preamble: This course has been designed to enrich the business management students with deeper understanding and practical wisdom on various aspects of system analysis and design (SAD) including the different methodologies, processes, techniques and tools in developing organizational information systems. Upon successful completion of the course a participant is expected to have deeper understanding on the theoretical concepts of SAD, and should be able to confidently apply their knowledge learned in an organizational context.

Prerequisite: Nil

Course Outcomes: After the completion of the course the student will be able to:

CO 1	Explain the tools used for system analysis and design
CO 2	Illustrate methods for structured system analysis and design.
CO 3	Explain I/O design and object oriented system modeling.
CO 4	Outline the control measures for performance and security of information system
CO 5	Summarize the applications of system analysis and design in e-commerce

Mapping of course outcomes with program outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1		2			
CO 2		2			
CO 3		2			
CO 4		2			
CO 5	2	2		2	

Assessment Pattern

Bloom's Category	Continuous Assessment Tests (in %)		End Semester Examination (in marks)
	1	2	
Remember	20	20	10
Understand	40	40	30
Apply	40	40	20
Analyze			
Evaluate	Can be done through Assignments/ Seminars/Mini Projects		
Create	Can be done through Assignments/ Seminars/Mini Projects		

Mark distribution

Total Marks	CIE	ESE	ESE Duration
100	40	60	3 hours

Continuous Internal Evaluation Pattern:

Attendance : 4 marks
Continuous Assessment Test (2 numbers) :16 marks
Assignment/Quiz/Course project :10 marks
Seminar and Discussion :10 marks

End Semester Examination Pattern:

There will be three parts; Part A, Part B and part C. Part A contains 5 questions (one question each from each module) of 2 marks each (Students should answer all questions). Part B contains 5 questions (one question each from each module) of 10 marks each (Students have the choice of answering any three questions). Part C contains a compulsory question (can have sub-divisions) of 20 marks (from any of the modules or combination) may be in application-level or case study.

Model Question paper

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER MBA DEGREE EXAMINATION

20MBA291- SYSTEM ANALYSIS AND DESIGN

Max. Marks: 60 Duration: 3 Hours

PART A

Answer ***all*** questions. Each question carries 2 marks.

1. Differentiate data and information
2. Point out the relevance of decision tables in an information system development process
3. What do you mean by validation of input data?
4. List out the different types of testing conducted during system analysis and design process
5. Explain digital signature.

(5x2 marks = 10 marks)

PART B

Answer any ***three*** questions. Each question carries 10 marks

6. Discuss the concept of feasibility study with appropriate examples.
7. Explain the concept of Entity Relationship Model with suitable examples
8. Elaborate object-oriented systems modeling techniques from an information system development perspective
9. "Disaster recovery and business continuity has high relevance in organizational sustainability." Discuss the disaster recovery and business continuity practices followed and implemented by the corporate enterprises.
10. .How do you enhance the security of e commerce transactions? Discuss the legal implications of e commerce transactions.

(3x10 marks = 30 marks)

PART C

Compulsory question. This question carries 20 marks

11. The three major stakeholders in an information system development projects are the end users, system/ business analysist and the management. Discuss the critical role of each of these stakeholders in the requirement identification and feasibility study stage of system development.

(1x20 marks =20marks)

Syllabus	
Module 1	**Overview of Data, Information, Systems Analysis and Design Life Cycle** Data and Information –Organizational need for information systems – qualities of information. Systems Analysis and Design Life Cycle -. Role of systems analyst – attributes of a systems analyst – Information gathering – system requirements specification – Feasibility analysis – Tools for systems analysts – data flow diagrams – leveling of DFDs – leveling rules – logical and physical. DFDs – software tools to create DFDs.
Module 2	**Structured systems analysis and design** Procedure specifications in structured English – examples and cases – decision tables for complex logical specifications – specification-oriented design vs procedure-oriented design; Data oriented systems design – entity relationship model – E-R diagrams – relationships cardinality and participation – normalizing relations – various normal forms and their need – some examples of relational data base design.
Module 3	**Data I/O methods and Object-oriented systems modeling** Data input methods – coding techniques – requirements of coding schemes – error detection of codes – validating input data – input data controls – interactive data input; Designing outputs – output devices – designing output reports – screen design – graphical user interfaces – interactive I/O on terminals – Object oriented systems modeling – composition and usefulness of objects– objects and their properties – classes – inheritance – polymorphism–how to identify objects in an application–how to model systems using objects – some cases of object-oriented system modeling.
Module 4	**Control** Control – audit and security of information systems – need for controls – objectives of control – techniques used in control – auditing information systems – auditing around, through and with the computer – testing information systems – types of tests – how to generate tests – security of information systems – disaster recovery – business process continuity.
Module 5	**Applications in e-commerce** Systems analysis and design in the era of electronic commerce – B2B, B2C and C2C e-commerce – advantages and disadvantages of e-commerce. E- commerce system architecture – physical networks, logical network, world wide web, web-services –html, XML; Electronic data interchange – EDI standards – virtual private networks – XML and EDI; Security of e-commerce transactions, firewalls – encryption methods – symmetric and asymmetric encryption – digital signature – certifying authorities for signatures – legal status of e-commerce transactions; software engineering and implementation - quality assurance through software engineering; Implementation of an information system.

Text Book

1. V Rajaraman. (2011), Analysis and Design of Information Systems, PHI Learning Private Limited
2. Preeti Gupta (2005), Structured System Analysis and Design, Firewall Media, Laxmi Publications Private Limited
3. J B Dixit and Rajkumar (2007), Structured System Analysis and Design, Laxmi Publications Private Limited

References and Suggested Readings

1. Tilley and Rosenblatt (2016), System Analysis and Design, Shelly Cashman series, Cengage Learning
2. Dennis, Wixom and Roth (2018), System Analysis and Design, Wiley
3. Charles S Wasson (2005), System Analysis, Design and Development: Concepts, Principles and Practices, John Wiley & Sons Inc.

Course Contents and Lecture Schedule

No.	Topic	No. of Lectures
1	**Overview of Data, Information, Systems Analysis and Design Life Cycle**	
1.1	Data and Information	1 Hour
1.2	Systems Analysis and Design Life Cycle	2 Hours
1.3	Information gathering & Requirement analysis	1 Hour
1.4	Feasibility analysis & Documentation	1 Hour
1.5	DFD	2 Hours
2	**Structured systems analysis and design**	
2.1	Decision tables for complex logical specifications	2 Hours
2.2	Specification-oriented design vs procedure-oriented design	2 Hours
2.3	Data oriented systems design	3 Hours
3	**Data I/O methods and Object-oriented systems modeling**	
3.1	Data input methods	2 Hours
3.2	Designing outputs	2 Hours
3.3	Object-oriented systems modelling	3 Hours
4	**Control**	
4.1	System Control and Audit	3 Hours
4.2	System Testing	2 Hours
4.3	System security and business process continuity	2 Hours
5	**Applications in e-commerce**	
5.1	E- commerce system architecture	2 Hours
5.2	Electronic data interchange	1 Hour
5.3	Digital signature	1 Hour
5.4	Legal status of e-commerce transactions	1 Hour
5.5	Software engineering and implementation	2 Hours
5.6	Implementation of Information systems	1 Hour
	Total	36 Hours

Course Code	Course Name	Category	L	T	P	Credit
20MBA293	GLOBAL INFORMATION SYSTEM	Elective	3	0	0	3

Preamble: The course on Global Information Systems introduces the participants on various technological aspects that supports business excellence while operating in a digitalized economic scenario. The concepts related to Information Systems in Global Business, Strategic connectivity, Physical connectivity, Emerging technologies, Managing global systems and Outsourcing opportunities & challenges are discussed in detail to empower the participants to gain knowledge and acquire related skill sets. Upon completion of the program, a participant should be able to appreciate, analyze and assess global information systems

Prerequisite: Nil

Course Outcomes: After the completion of the course the student will be able to:

CO 1	Explain the importance of information system in global business.
CO 2	Identify the challenges of data storage and security
CO 3	Outline the communication technologies required for physical connectivity in global business
CO 4	Analyse business requirements for selecting appropriate information systems to achieve organizational excellence.
CO 5	Assess outsourcing of organization's IT function from strategic and governance perspective.

Mapping of course outcomes with program outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1					
CO 2				2	
CO 3					
CO 4	3	3		2	
CO 5	3	3		2	

Assessment Pattern

Bloom's Category	Continuous Assessment Tests (in %)		End Semester Examination (in marks)
	1	2	
Remember	20	20	10
Understand	40	40	30
Apply	40	40	20
Analyze			
Evaluate	Can be done through Assignments/ Seminars/Mini Projects		
Create	Can be done through Assignments/ Seminars/Mini Projects		

Mark distribution

Total Marks	CIE	ESE	ESE Duration
100	40	60	3 hours

Continuous Internal Evaluation Pattern:

Attendance : 4 marks

Continuous Assessment Test (2 numbers) :16 marks

Assignment/Quiz/Course project :10 marks

Seminar and Discussion :10 marks

End Semester Examination Pattern:

There will be three parts; Part A, Part B and part C. Part A contains 5 questions (one question each from each module) of 2 marks each (Students should answer all questions). Part B contains 5 questions (one question each from each module) of 10 marks each (Students have the choice of answering any three questions). Part C contains a compulsory question (can have sub-divisions) of 20 marks (from any of the modules or combination) may be in application-level or case study.

Model Question paper

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER MBA DEGREE EXAMINATION

20MBA293- GLOBAL INFORMATION SYSTEM

Max. Marks: 60 Duration: 3 Hours

PART A

Answer ***all*** questions. Each question carries 2 marks

1. Define e_business.
2. List out the benefits of Firewalls
3. What do you mean by Network Protocols
4. Give three examples for business requirements in information system projects
5. Give few benefits of Micro-sourcing.

(5x2 marks = 10 marks)

PART B

Answer any ***three*** questions. Each question carries 10 marks

6. Discuss the challenges faced in the rollout of multi-site global information system projects.
7. Elaborate the implications of Moore's Law in information systems projects.
8. Critically examine the emerging technologies used in information system projects.
9. What are the major challenges faced while managing global information systems?
10. IT outsourcing has been always risky and challenging for corporate enterprises. Do you agree with this statement? Discuss your views with appropriate examples from the industry.

(3x10 marks = 30 marks)

PART C

Compulsory question. This question carries 20 marks

11. ABC Inc., is a global market leader in COCOA industry and operates in 16 different countries in MENA region. In the recent board meeting the management decided to integrate the software solutions used in 16 different countries and develop a global information system. The Chief IT Officer (CITO) has been entrusted the responsibility to develop a strategic plan and explain the competitive advantage. Discuss in details about the various aspects that the CITO must consider while preparing his report to the board.

(1x20 marks =20marks)

Syllabus	
Module 1	**Information Systems in Global Business** Information Systems in Global Business Today – systems in businesses, why it's important; Global IT workforce vs Domestic Workforce; Global e- business and collaboration; obstacles in rollout, challenges in Multi site projects; tools and techniques to increase productivity; implications of poor global information systems management.
Module 2	**Data storage and security** Moore's Law; Law of Mass Storage; Implications of laws in reducing costs and improving performance; Cloud computing; Cloud in multinational enterprise; Firewalls, hacking, ethical hacking, role of systems managers, system administrators.
Module 3	**Technologies for physical connectivity in global business** Information Technology, Corporate Strategy, and Competitive Advantage (Interlinked Value Chains); Basic Communications Technology and Concepts, Local Area Networks, Wide Area Networks (Packet Networks), Network Protocols (ISO OSI); *Emerging technologies* Frame Relay, ATM, VOIP; ADSL, Cable Modem, wireless, Mobile technology.
Module 4	**Managing global systems** Key business drivers and challenges in the global environment; strategies for success in the global market; "connectivity" as a driver for global information system; software be designed to fit the business requirements Vs. business requirements be modified to fit existingsoftware.
Module 5	**Outsourcing** B2B Exchange Model; Micro-sourcing; Outsourcing from Service Provider Viewpoint; Producer/Consumer Perspective in Outsourcing; Voluntary/Involuntary Perspective in Outsourcing; Need to outsource; challenges and risks, advantages and disadvantages associated with outsourcing an organization's IT function; different kinds of outsourcing currently in use in today's global economy.

Text Book

1. Dorothy E Leidner and Tim Kayworth (2008), Global Information Systems: The Implications of Culture for IS Management, A Butterworth-Heinemann Title
2. Jawadekar. (2013) Management Information Systems: A Global Digital Enterprise Perspective, McGraw Hill Education (India) Private Limited
3. Yi chen Lan. (2006), Global Information Society: Operating Information Systems in a Dynamic Global Business Environment, Idea Group Publication.

References and Suggested Readings

1. Ash Bisaria, What's next for outsourcing? –http://outsourcemag.com/whats-next-for-outsourcing/
2. Nigel Chisnall, All sides are winners as IT outsourcing deals get shorter and less costly – http://outsourcemag
3. Arshdeep Bahga and Vijay Madisetti. (2014), Cloud Computing: A Hands-on Approach, Orient Blackswan Pvt Ltd,India.
4. Thorsten Blecker. (2007), Mass Customization Information Systems in Business, IGI Global.
5. Emily Nagle Green (2010), Anywhere: How Global Connectivity is Revolutionizing

the Way We Do Business, McGraw Hill Education (India) Private Limited.
6. Andrew S Tanenbaum and Herbert Bos (2015), Modern Operating Systems: Global Edition, Kindle Edition, Pearson Education.
7. Mary C. Lacity, Leslie P. Willcocks, Mary Cecelia Lacity, and Leslie Willcocks (2000), Global Information Technology Outsourcing: In Search of Business Advantage, John Wiley & Sons.
8. Erran Carmel and Paul Tjia (2005), Offshoring Information Technology: Sourcing and Outsourcing to a Global Workforce, Cambridge University Press.

Course Contents and Lecture Schedule

No.	Topic	No. of Lectures
1	**Information Systems in global business**	
1.1	Information Systems in global business today	1 Hour
1.2	Global e-business and collaboration	2 Hours
1.3	Tools and techniques to increase productivity	2 Hours
1.4	Implications of poor global information systems management;	2 Hours
2	**Data storage and security**	
2.1	Moore's Law	2 Hours
2.2	Cloud computing	2 Hours
2.3	Firewalls, hacking, ethical hacking	3 Hours
2.4	Role system managers and administrators	1 Hours
3	**Technologies for physical connectivity in global business**	
3.1	Corporate strategy, and Competitive advantage (Interlinked Value Chains)	3 Hours
3.2	Physical connectivity	2 Hours
3.3	Emerging technologies	2 Hours
4	**Managing global systems**	
4.1	Key business drivers and challenges in the global environment	1 Hour
4.2	Strategies for success in the global market	2 Hours
4.3	"Connectivity" as a driver for global information system	2 Hours
4.4	Software design for business requirement v/s business requirement modification for existing software	2 Hours
5	**Outsourcing**	
5.1	Outsourcing models	2 Hours
5.2	Outsourcing Organization's IT function	3 Hours
5.3	Outsourcing currently in use in today's global economy	2 Hours
	Total	36 Hours

Course Code	Course Name	Category	L	T	P	Credit
20MBA295	BUSINESS DATABASE SYSTEM	Elective	3	0	0	3

Preamble: Developing and managing efficient and effective database applications requires understanding the fundamentals of database management systems, techniques for the design of databases, and principles of database administration. The objective of this course is to deliver the fundamentals of database. A variety of topics will be covered that are important for modern databases in order to prepare the students for real life applications of databases.

Prerequisite: Nil

Course Outcomes: After the completion of the course the student will be able to:

CO 1	Explain the fundamental elements of business database environment.
CO 2	Demonstrate the ability to design Database models to represent business scenarios
CO 3	Examine File organization in DBMS
CO 4	Develop Conceptual data models
CO 5	Appraise on Distributed data models and security

Mapping of course outcomes with program outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1		2		2	
CO 2		2		2	
CO 3		2			
CO 4		2			
CO 5		2			

Assessment Pattern

Bloom's Category	Continuous Assessment Tests (in %)		End Semester Examination (in marks)
	1	2	
Remember	20	20	10
Understand	40	40	30
Apply	40	40	20
Analyze			
Evaluate	Can be done through Assignments/ Seminars/Mini Projects		
Create	Can be done through Assignments/ Seminars/Mini Projects		

Mark distribution

Total Marks	CIE	ESE	ESE Duration
100	40	60	3 hours

Continuous Internal Evaluation Pattern:

Attendance : 4 marks
Continuous Assessment Test (2 numbers) : 16 marks
Assignment/Quiz/Course project : 10 marks
Seminar and Discussion : 10 marks

End Semester Examination Pattern:

There will be three parts; Part A, Part B and part C. Part A contains 5 questions (one question each from each module) of 2 marks each (Students should answer all questions). Part B contains 5 questions (one question each from each module) of 10 marks each (Students have the choice of answering any three questions). Part C contains a compulsory question (can have sub-divisions) of 20 marks (from any of the modules or combination) may be in application-level or case study.

Model Question paper

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER MBA DEGREE EXAMINATION

20MBA295– BUSINESS DATABASE SYSTEMS

Max. Marks: 60 **Duration: 3 Hours**

PART A

Answer ***all*** questions. Each question carries 2 marks

1. List the components of a database environment
2. Define a Relational databases
3. What is a hash index?
4. What are the different types of Entities?
5. What are the components of a DDBMS?

(5x2 marks = 10 marks)

PART B

Answer any ***three*** questions. Each question carries 10 marks

6. a. Compare traditional File Systems with Database Management Systems (6 marks)
   b. Explain advantages and disadvantages of DBMS (4 marks)
7. a. Explain in details various data models (5 marks)
   b. Explain Data abstraction and schema architecture (5 marks)
8. a. Detail on Hashing Techniques (6 marks)
   b. Explain Buffering of blocks. (4 marks)
9. a. With an example, develop an ER Model with relevant components (7marks)
   b. What are database design challenges (3 marks)
10. a. Analyze on Distributed database design security and integrity violations (6 marks)
    b. Develop distributed database design concepts (4 marks)

(3x10 marks = 30 marks)

PART C

Compulsory question. This question carries 20 marks

11. Develop an ER diagram for keeping track of information about a company database taking into account atleast five entities. With a neat block diagram, represent the architecture of a typical DBMS required for the company.

(1x20 marks = 20 marks)

Syllabus	
Module 1	**Database Environment**, functioning of a Simple Centralized Database System, Traditional File Systems vs. Modern Database Management Systems, Properties of Database, Types of Database Users, Advantages of DBMS, Applications
Module 2	**Data Model**, Schemas and Instances, three schema architecture, Languages and Interfaces, DBMS Components, Classification of Database Management Systems, DDL, DML and use of SQL in relational Databases and normalization.
Module 3	**File Organization-**Memory Hierarchy, Secondary Storage Devices, Buffering of Blocks, Placing File Records on Disk, Operation on Files, Files of Unordered Records (Heap Files), Files of Ordered Records, Hashing Techniques- primary index and clustering index
Module 4	**Conceptual Data model** - ER Model Concept using example, Components of an ER Model, Relationships, Roles and Structural constraints, Constraints on Relationship Types
Module 5	**Distributed DBMS Concepts**, Client-Server Model, Data Fragmentation, Replication, and Allocation Techniques for Distributed Database Design Security and Integrity Violations, Authorization, Granting of Privileges

Text Book

1. C. J. Date, A. Kannan and S. Swamynathan, An Introduction to Database Systems, Pearson Education.
2. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, McGraw-Hill Higher Education

References and Suggested Readings

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, Database System Concepts, McGraw-Hill Education (Asia).
2. Shio Kumar Singh, Database Systems Concepts, Designs and Application, Pearson Education.
3. Peter Rob and Carlos Coronel, Database Systems Design, Implementation and Management, Thomson Learning-Course Technology.
4. Patrick O'Neil and Elizabeth O'Neil, Database Principles, Programming and Performance, Harcourt Asia Pvt. Ltd

Course Contents and Lecture Schedule

No	Topic	No. of Lectures
1	**Database Environment**	
1.1	Centralized Database System, Traditional File Systems vs. Modern Database Management Systems	2 Hours
1.2	Properties of Database, Types of Database Users, Advantages of DBMS,	3 Hours
1.3	Applications	2 Hours
2	**Data Model**	
2.1	Schemas, three schema architecture, Languages and Interfaces	2 Hours
2.2	DBMS Components, Classification of Database Management Systems	3 Hours
2.3	DDL, DML and use of SQL in relational databases and normalization	2 Hours
3	**File Organization**	
3.1	Memory Hierarchy, Secondary Storage Devices, Buffering of Blocks	2 Hours
3.2	Placing File Records on Disk, Operation on Files, Files of Unordered and Ordered Records,	3 Hours
3.3	Hashing Techniques- primary index and clustering index	2 Hours
4	**Conceptual Data model - ER Model**	
4.1	ER Model Concept using example	3 Hours
4.2	Components of an ER Model, Relationships,	3 Hours
4.3	Roles and Structural constraints, Constraints on Relationship Types	2 Hours
5	**Distributed DBMS Concepts**	
5.1	Client-Server Model, Data Fragmentation, Replication	2 Hours
5.2	Allocation Techniques for Distributed Database Design Security and Integrity Violations	3 Hours
5.3	Authorization, Granting of Privileges	2 Hours
	TOTAL	36 hours

Course Code	Course Name	Category	L	T	P	Credit
20MBA297	KNOWLEDGE MANAGEMENT AND IT/ITES CONSULTING	Elective	3	0	0	3

Preamble: Knowledge management (KM) is the process of creating, sharing, using and managing the knowledge and information of an organization. It refers to a multidisciplinary approach to achieve organisational objectives by making the best use of knowledge. Knowledge management is important because it boosts the efficiency of an organization's decision-making ability. In making sure that all employees have access to the overall expertise held within the organization, a smarter workforce is built who are more able to make quick, informed decisions that benefit the company.

Prerequisite: Nil

Course Outcomes (COs): After the completion of the course the student will be able to

CO 1	Define the concepts, theories, terminologies associated with knowledge management and knowledge creation
CO 2	Explain the organisational knowledge creation theories
CO 3	Apply the knowledge management assessment tools to solve business problems.
CO 4	Analyse strategies developed using knowledge management tools with the help of Information Technology
CO 5	Evaluate the application of knowledge management in IT and ITES for strategic development

Mapping of course outcomes with program

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1		2			
CO 2		2		2	
CO 3	3	3			
CO 4		3		2	
CO 5		3			

Assessment Pattern

Bloom's Category	Continuous Assessment Tests (in %)		End Semester Examination (in marks)
	1	2	
Remember	20	20	10
Understand	40	40	30
Apply	40	40	20
Analyze			
Evaluate	Can be done through Assignments/ Seminars/Mini Projects		
Create	Can be done through Assignments/ Seminars/Mini Projects		

Mark distribution

Total Marks	CIE	ESE	ESE Duration
100	40	60	3 hours

Continuous Internal Evaluation Pattern:

Attendance : 4 marks

Continuous Assessment Test (2 numbers) : 16 marks

Assignment/Quiz/Course project : 10 marks

Seminar and Discussion : 10 marks

End Semester Examination Pattern:

There will be three parts; Part A, Part B and part C. Part A contains 5 questions (one question each from each module) of 2 marks each (Students should answer all questions). Part B contains 5 questions (one question each from each module) of 10 marks each (Students have the choice of answering any three questions). Part C contains a compulsory question (can have sub-divisions) of 20 marks (from any of the modules or combination) may be in application-level or case study.

Model Question paper

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER MBA DEGREE EXAMINATION

20MBA297 KNOWLEDGE MANAGEMENT AND IT/ITES CONSULTING

Max. Marks: 60 Duration: 3 Hours

PART A

Answer ***all*** questions. Each question carries 2 marks.

1. Define knowledge management
2. What is multi dimensional organisational learning?
3. Define GPO-WM implementation mode
4. What is content analysis.
5. What is system life cycle?

(5x2 marks = 10 marks)

PART B

Answer any ***three*** questions. Each question carries 10 marks

6. Explain in detail technological vs pre technological knowledge.
7. Illustrate in detail about knowledge diversity and knowledge creation?
8. Explain in detail knowledge auditing and its impact.
9. Explain in detail regarding methods of structuring knowledge and Information.
10. Illustrate how knowledge management is done in a manufacturing company with an example.

(3x10 marks = 30 marks)

PART C

Compulsory question. This question carries 20 marks

11. Imagine that you are having an online E-Commerce B2C market. Analyse how you will be utilising knowledge management with IT support to a) Increase the customer base b) Engaging customers and developing good customer relationship

(1x20 marks = 20 marks)

Syllabus	
Module 1	**Overview of Knowledge Management** - Human cognition from the technology manager's perspective; Knowledge creation at the level of the individual, group and organization; The nature of technical problem solving, Formulating knowledge, Explicit and codified knowledge Tacit, implicit and sticky knowledge; Technological versus pre- technological knowledge; Experts and expertise.
Module 2	**Managing organizational knowledge, learning and intellectual capital**- Developing metrics for knowledge, learning and intellectual capital; Knowledge quality; Organizational knowledge creation theories and their application; Experimentation strategies for knowledge creation; Knowledge diversity and knowledge integration; Multi-dimensional organizational learning; Knowledge transfer; Value-of-ownership models
Module 3	**The knowledge management core process -** The Knowledge Management Design Fields; Business Process Oriented Knowledge Management – The GPO-WM Implementation Mode, KM Strategy, The GPO-WM Analysis of Business Process, KM Solutions, KM-Implementation Phase; The Fraunhofer Knowledge Management Audit (FKM Audit), Audit approaches for the evaluation of Knowledge Management – The Knowledge Audit (According to Liebowitz), Knowledge Management Assessment Tool (KMAT), Knowledge Management Diagnostic (KMD), Knowledge Audit (According to Pfeifer), Knowledge Management Maturity Model (KMMM)..
Module 4	**Knowledge Management Tools** - Diagnostic technologies and their value Structuring Knowledge and Information – Definition of knowledge structure, Search strategies and knowledge structures, methods of structuring knowledge and Information Data management, information technology and organizational productivity; Web-centric knowledge management, Global, joint, simultaneous problem solving in a value network; Content Analysis
Module 5	**Applications of knowledge management in IT & ITES** - Application - Information Technology – Intranets; Best Practices; Systems Analysis Techniques; Systems Lifecycle; Design & Evaluation; Knowledge management in manufacturing and the service sector; Knowledge Management: Retaining Knowledge in IT/ITES Companies – Dissatisfied customers – breaches in SLAs; Productivity challenges; Increased competition; Knowledge scarcity; KM Solution - Nephila.

Text Book

1. Kai Mertins, Peter Heisig and Jens Vorbeck (2003), *Knowledge Management – Concepts and Best Practices*, Springer.
2. Davenport, Thomas and Laurence Prusak. (2000), *Working Knowledge: How Corporations Manage What They Know.* Boston, Harvard Business School Press.
3. Kimiz Dalkir (2011), *Knowledge Management in Theory and Practice*, MIT Press.
4. Edna Pasher and Tuvya Ronen (2011), *Knowledge Management in Theory and Practice*, John Wiley & Sons.

References and Suggested Readings
1. Dr. Santwana Chaudhuri (2011), *Knowledge Management in Indian IT Industries*, 3rd International Conference on Information and Financial Engineering IPEDR vol.12, IACSIT Press, Singapore, http://www.ipedr.com/vol12/45-C115.pdf 2. Donald Hislop (2013), *Knowledge Management in Organizations: A Critical Introduction*, Oxford University Press. 3. Elias.M. Award and Hassan M. Ghaziri (2003), *Knowledge Management*, Pearson Education.

Course Contents and Lecture Schedule

No	Topic	No. of Lectures
1	**Overview of Knowledge Management**	
1.1	Human cognition from the technology manager's perspective; Knowledge creation at the level of the individual, group and organization	2 Hours
1.2	The nature of technical problem solving, Formulating knowledge, Explicit and codified knowledge	3 Hours
1.3	Tacit, implicit and sticky knowledge; Technological versus pre-technological knowledge; Experts and expertise.	2 Hours
2	**Managing organizational knowledge, learning and intellectual capital**	
2.1	Developing metrics for knowledge, learning and intellectual capital; Knowledge quality	3 Hours
2.2	Organizational knowledge creation theories and their application; Experimentation strategies for knowledge creation	2 Hours
2.3	Knowledge diversity and knowledge integration; Multi-dimensional organizational learning; Knowledge transfer; Value-of-ownership models	3 Hours
3	**The knowledge management core process**	
3.1	The Knowledge Management Design Fields; Business Process Oriented Knowledge Management – The GPO-WM Implementation Mode, KM Strategy, The GPO-WM Analysis of Business Process, KM Solutions, KM-Implementation Phase	2 Hours
3.2	The Fraunhofer Knowledge Management Audit (FKM Audit), Audit approaches for the evaluation of Knowledge Management	2 Hours
3.3	The Knowledge Audit (According to Liebowitz), Knowledge Management Assessment Tool (KMAT), Knowledge Management Diagnostic (KMD), Knowledge Audit (According to Pfeifer), Knowledge Management Maturity Model (KMMM).	3 Hours
4	**Knowledge Management Tools**	
4.1	Diagnostic technologies and their value - Structuring Knowledge and Information – Definition of knowledge structure	2 Hours
4.2	Search strategies and knowledge structures, methods of structuring knowledge and Information Data management, information technology and organizational productivity.	2 Hours
4.3	Web-centric knowledge management Global, joint, simultaneous problem solving in a value network; Content Analysis	2 Hours

5	**Applications of knowledge management in IT & ITES**	
5.1	Application - Information Technology – Intranets; Best Practices; Systems Analysis Techniques;	2 Hours
5.2	Systems Lifecycle; Design & Evaluation; Knowledge management in manufacturing and the service sector	3 Hours
5.3	Knowledge Management: Retaining Knowledge in IT/ITES Companies – Dissatisfied customers – breaches in SLAs; Productivity challenges Increased competition; Knowledge scarcity; KM Solution - Nephila	3 Hours
	Total	36 Hours

Course Code	Course Name	Category	L	T	P	Credit
20MBA299	INFORMATION SECURITY AND RISK MANAGEMENT	Elective	3	0	0	3

Preamble: This course prepares the participant to appreciate and apply the theoretical and conceptual knowledge learned to improve their information security responsible behavior and further to develop skills in a work-related context in an organizational environment. The academic engagement of this course will discuss topics on information security management, risk assessment, risk management, ISMS, information security culture, information security governance, business continuity planning and the salient features of the Indian IT Act 2000. The participants of the course will be prepared to reflectively apply the learning from the course while working in an organizational environment.

Prerequisite: Nil

Course Outcomes: After the completion of the course the student will be able to:

CO 1	Explain information management systems concepts and terminologies.
CO 2	Illustrate information security related risk assessment and management.
CO 3	Analyse organizational information security requirements in line with Information Security Management Systems (ISO 27001).
CO 4	Evaluate information security culture in an organization.
CO 5	Interpret the Indian cyber law and IT Act 2000 based on a digitalised business environment.

Mapping of course outcomes with program outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1		2			
CO 2		2			
CO 3	2	2		2	
CO 4	1	2		1	
CO 5		2		2	

Assessment Pattern

Bloom's Category	Continuous Assessment Tests (in %)		End Semester Examination (in marks)
	1	2	
Remember	20	20	10
Understand	40	40	30
Apply	40	40	20
Analyze			
Evaluate	Can be done through Assignments/ Seminars/Mini Projects		
Create	Can be done through Assignments/ Seminars/Mini Projects		

Mark distribution

Total Marks	CIE	ESE	ESE Duration
100	40	60	3 hours

Continuous Internal Evaluation Pattern:

Attendance : 4 marks
Continuous Assessment Test (2 numbers) :16 marks
Assignment/Quiz/Course project :10 marks
Seminar and Discussion :10 marks

End Semester Examination Pattern:

There will be three parts; Part A, Part B and part C. Part A contains 5 questions (one question each from each module) of 2 marks each (Students should answer all questions). Part B contains 5 questions (one question each from each module) of 10 marks each (Students have the choice of answering any three questions). Part C contains a compulsory question (can have sub-divisions) of 20 marks (from any of the modules or combination) may be in application-level or case study.

Model Question paper

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER MBA DEGREE EXAMINATION

20MBA299- INFORMATION SECURITY AND RISK MANAGEMENT

Max. Marks: 60 Duration: 3 Hours

PART A

Answer ***all*** questions. Each question carries 2 marks

1. List out the different classification of information assets in an organization?
2. Define business continuity planning
3. What is the relevance of ISMS from an organizational perspective?
4. Recall three major challenges in maintaining good information security culture in the Indian organizations.
5. What are the major objectives of the Indian IT Act 2000?

(5x2 marks = 10 marks)

PART B

Answer any ***three*** questions. Each question carries 10 marks

6. Discuss the inter relationship among vulnerability, threats and risk in an information security context, and its organizational business impact.
7. "Risk treatment is important, but risk assessment is critical". Discuss your views with suitable examples.
8. Explain ISMS (ISO 27001) domains in detail.
9. Sketch your strategies to raise information security awareness in a banking organization.
10. Discuss in detail the salient provisions of the Indian IT act 2000

(3x10 marks = 30 marks)

PART C

Compulsory question. This question carries 20 marks

11. ABCO Bank has recently appointed Ms. Niya as the chief information security officer. One of her key responsibilities is to prepare the organization for ISMS implementation. Discuss in detail those aspects she should consider for successful roll out of this project.

(1X20 marks =20marks)

Syllabus	
Module 1	**Information Security Management** Introduction-Information-Value of Information – Information Asset Classification-Information Security- Vulnerability- Threats- Risks- Security Objectives- Organisational Business Impact, Case Study on Information Security Management
Module 2	**Risk Assessment & Management** Security Risk – Nature of Risk – Nature of Information Security Risk – Risk Assessment- Risk Assessment Process – Risk Assessment Approaches - Risk Management Process – Risk Treatment – Risk Management System – Information Security Measures – Business Continuity Management
Module 3	**Information Security Management Systems (**ISMS (ISO 27001)) ISMS Process Model - Information Security Policy – Organisation of Information Security- Asset Management - Human Resource Security – Physical and Environmental Security – Communications and Operations Management – Access Control - Information System Accusation, Development and Maintenance – Information Security Incident Management – Business Continuity Management – Compliance
Module 4	**Organisational Information Security Governance**– Management of Information Security -Organisational Issues – Information Security Awareness - Information Security Culture – Information Security Governance
Module 5	**Cyber Law in India and IT Act 2000** Need for strong cyber law in India- Objectives of IT Act 2000-Cyber Offences under IT Act 2000- Important Definitions under IT Act 2000- Salient Provisions of IT Act 2000- Emergence of IT Amendment Act (ITAA) 2008

Text Book

1. Manish Agrawal, Alex Campoe, Eric Pierce (2014), Information Security and Risk Management, 2nd edition Wiley India.
2. Mark Stamp (2011), Information Security: Principles and Practice, 2nd edition Wiley India
3. David Alexander, Amanda Finch, David Sutton, Andy Taylor (2013), Information Security Management Principles, 2nd edition, BCS
4. Evan Wheeler, Security Risk Management: Building an Information Security Risk Management Program from the Ground Up, 1st edition Syngress

References and Suggested Readings

1. Sari Greene (2014), Security Program and Policies: Governance and Risk Management, 2nd edition Pearson
2. Venkatraman Rajendran, IT Security, Indian Institute of Banking & Finance, Taxmann Publications Pvt. Ltd
3. Geetha, Swapna Raman, Cyber Crimes and Fraud Management, Indian Institute of Banking & Finance, Macmillan Publications India Ltd
4. Steve G Watkins, An Introduction to Information Security and ISO27001: 2013: A Pocket Guide, IT Governance Publishing
5. Bel G. Raggad, Information Security Management: Concepts and Practice, CRC Press, ISBN 9781420078541

Course Contents and Lecture Schedule

No.	Topic	No. of Lectures
1	**Information Security Management**	
1.1	Introduction to Information Security Management	2 Hours
1.2	Information Asset Classification	2 Hours
1.3	Information Security- Vulnerability- Threats- Risks- Security Objectives- Organisational Business Impact	3 Hours
2	**Risk Assessment & Management**	
2.1	Risk and Risk Assessment	3 Hours
2.2	Risk Management Process and Systems	2 Hours
2.3	Business Continuity Management	2 Hours
3	**Information Security Management Systems**	
3.1	ISMS Process Model	3 Hours
3.2	Communications and Operations Management	2 Hours
3.3	Business Continuity Management	2 Hours
4	**Organisational Information Security Governance**	
4.1	Management of Information Security in organisations and related issues	3 Hours
4.2	Information Security Culture	2 Hours
4.3	Information Security Governance	2 Hours
5	**Cyber Law in India and IT Act 2000**	
5.1	Need for Cyber Law in India	1 Hour
5.2	Introduction to IT Act 2000	1 Hour
5.3	Important Definitions under IT Act 2000	2 Hours
5.4	Salient Provisions of IT Act 2000	2 Hours
5.5	Emergence of IT Amendment Act (ITAA) 2008	2 Hours
	Total	36 Hours

Course Code	Course Name	Category	L	T	P	Credit
20MBA301	BUSINESS INTELLIGENCE AND DATA WAREHOUSING	Elective	3	0	0	3

Preamble: Business intelligence (BI) is a collection of applications and techniques used to transform data into actionable information. BI involves enterprise-level data analysis that pinpoints areas for operational improvement and external expansion. In addition, business intelligence can incorporate data visualization, which further facilitates strategic business decisions. Data mining is a branch of data science that searches through vast datasets, mining for nuggets of wisdom. Data mining exposes patterns in massive datasets that can provide valuable business intelligence.

Prerequisite: Nil

Course Outcomes: After the completion of the course the student will be able to:

CO 1	Define all the concepts, theories, terminologies associated with warehousing and warehouse architecture mining
CO 2	Explain all the conceptual models of data mining and datamining systems
CO 3	Understand the logic and algorithm in data mining to solve various business scenario
CO 4	Analyse various classifications and prediction methods in business intelligence
CO 5	Evaluate the various business scenarios in retail industry, telecommunications industry, banking & finance and CRM

Mapping of course outcomes with program outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	3	2	3	2
CO 2	2	2	2	3	3
CO 3	3	2	2	3	3
CO 4	2	3	3	2	2
CO 5	3	2	2	3	3

Assessment Pattern

Bloom's Category	Continuous Assessment Tests (in %)		End Semester Examination (in marks)
	1	2	
Remember	20	20	10
Understand	40	40	30
Apply	40	40	20
Analyze			
Evaluate	Can be done through Assignments/ Seminars/Mini Projects		
Create	Can be done through Assignments/ Seminars/Mini Projects		

Mark distribution

Total Marks	CIE	ESE	ESE Duration
100	40	60	3 hours

Continuous Internal Evaluation Pattern:

Attendance : 4 marks
Continuous Assessment Test (2 numbers) : 16 marks
Assignment/Quiz/Course project : 10 marks
Seminar and Discussion : 10 marks

End Semester Examination Pattern:

There will be three parts; Part A, Part B and part C. Part A contains 5 questions (one question each from each module) of 2 marks each (Students should answer all questions). Part B contains 5 questions (one question each from each module) of 10 marks each (Students have the choice of answering any three questions). Part C contains a compulsory question (can have sub-divisions) of 20 marks (from any of the modules or combination) may be in application-level or case study.

Model Question paper

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER MBA DEGREE EXAMINATION

20MBA301- BUSINESS INTELLIGENCE AND DATAWAREHOUSING

Max. Marks: 60 Duration: 3 Hours

PART A

Answer ***all*** questions. Each question carries 2 marks.

1. Define Data warehouse.
2. What is data mining?
3. Define incremental ARM.
4. Define CART.
5. What is Web mining?

(5x2 marks = 10 marks)

PART B

Answer any three questions. Each question carries 10 marks

6. Explain in detail about building blocks of data warehousing. How OLAP servers help in data warehousing?
7. Illustrate the difference between business intelligence and data mining. What are the various classifications of DM systems?
8. Explain in detail regarding data generalisation and summarisation. How appriori algorithm is useful in plotting data?
9. Explain in how linear and non-linear regression is used in prediction. How case-based reasoning is used in business?
10. Explain in detail web usage mining. How data mining can be used for balanced score card?

(3x10 marks = 30 marks)

PART C

Compulsory question. This question carries 20 marks

11. Analyse how a company can utilise data mining for click streaming and market segmentation if it wants to expand its business to a entirely new market place.

(1x20 marks = 20 marks)

Syllabus	
Module 1	**Overview and concepts of Data Warehousing (DW) and Business Intelligence (BI)** Analyzing data, Raw data to valuable information-Lifecycle of Data - What is Business Intelligence - BI and DW in today's perspective - What is data warehousing - The building Blocks: Defining Features - Data warehouses and data marts, Virtual Warehouses - Overview of the components - Metadata in the data warehouse - Need for data warehousing - Basic elements of data warehousing, Architectures, OLAP and OLAP Servers – recent trends in data warehousing, Dynamic Warehousing.
Module 2	**The Architecture of BI and Introduction to data mining (DM)** BI and DW architectures and its types - Relation between BI and Data Mining. Motivation for Data Mining - Data Mining- Definition and Functionalities Classification of DM Systems - DM task primitives - Integration of a Data Mining system with a Database or a Data Warehouse - Issues in DM. KDD Process- Various Models and their significance.
Module 3	**Concept Description and Association Rule Mining** Concept description - Data Generalization and summarization-based characterization - Attribute relevance - class comparisons Association Rule Mining: Market basket analysis - basic concepts - Finding frequent item sets: Apriori algorithm - generating rules – Improved Apriori algorithms, FP Growth Algorithm – Incremental ARM – Associative Classification – Rule Mining, ARCS.
Module 4	**Classification and Prediction** Issues regarding Classification and prediction; Various Classifiers and Classification methods - Decision tree, Bayesian Classification, Rule Based Classifiers, CART, Neural Network, Nearest Neighbour, Case Based Reasoning, Rough Set Approach. The role of Genetic Algorithm and fuzzy logic; Prediction methods - Linear and nonlinear regression, Logistic Regression.
Module 5	**Web mining and Data Mining for Business Intelligence Applications** Web Mining - Web mining introduction, Web Content Mining, Web Structure Mining, Web Usage mining, Automatic Classification of web Documents. Data Mining for Business Intelligence Applications - Data mining for business Applications like Balanced Scorecard, Fraud Detection, Clickstream Mining, Market Segmentation, retail industry, telecommunications industry, banking & finance and CRM.

Text Book

1. William H. Inmon, (2005). *Building the Data Warehouse*, Wiley India Private Limited.
2. Michael J.A. Berry and Gordon S. Linoff, (2012) *Data Mining Techniques: for Marketing, Sales and Customer Relationship Management*, Wiley India Private Ltd.
3. Jiawei Han, Micheline Kamber and Jian Pei. (2012) *Data Mining Concepts and Techniques*, Elsevier.
4. Ramesh Sharda, Dursun Delen Efraim Turban, David King, (2013) *Business Intelligence: A Managerial Approach*, Pearson Education.

References and Suggested Readings

1. Paulraj Ponniah (2012) *Data Warehousing Fundamental for IT Professionals*, John Willey.
2. J. Han and M. Kamber, (2011). *Data Mining Concepts and Techniques*, Morgan Kaufmann Publishers.
3. Mehmed Kantardzic, (2011) *Data mining: Concepts, models, methods and algorithms*, John- Blackwell.
4. David Loshin, (2012). *Business Intelligence: The Savvy Manager's Guide*, Elsevier.
5. Carlo Vercellis, (2013). *Business Intelligence: Data Mining and Optimization for Decision Making (WSE)*, Wiley India Private Limited.

Course Contents and Lecture Schedule

No	Topic	No. of Lectures
1	**Overview and concepts Data Warehousing (DW) and Business Intelligence (BI)**	
1.1	Analyzing data, Raw data to valuable information-Lifecycle of Data - What is Business Intelligence - BI and DW in today's perspective - What is data warehousing - The building Blocks	2 Hours
1.2	Data warehouses and data marts, Virtual Warehouses - Overview of the components - Metadata in the data warehouse - Need for data warehousing - Basic elements of data warehousing, Architectures,	3 Hours
1.3	OLAP and OLAP Servers – recent trends in data warehousing, Dynamic Warehousing	2 Hours
2	**The Architecture of BI and Introduction to data mining (DM)**	
2.1	BI and DW architectures and its types - Relation between BI and Data Mining. Motivation for Data Mining - Data Mining-Definition and Functionalities	3 Hours
2.2	Classification of DM Systems – DM task primitives - Integration of a Data Mining system with a Database or a Data Warehouse	2 Hours
2.3	– Issues in DM KDD Process- Various Models and their significance	3 Hours

3	**Concept Description and Association Rule Mining**	
3.1	Concept description - Data Generalization and summarization-based characterization - Attribute relevance - class comparisons Association Rule Mining	2 Hours
3.2	Market basket analysis - basic concepts - Finding frequent item sets: Apriori algorithm - generating rules – Improved Apriori algorithms	2 Hours
3.3	FP Growth Algorithm – Incremental ARM – Associative Classification – Rule Mining, ARCS.	3 Hours
4	**Classification and Prediction**	
4.1	Issues regarding Classification and prediction; Various Classifiers and Classification methods	2 Hours
4.2	Decision tree, Bayesian Classification, Rule Based Classifiers, CART, Neural Network, Nearest Neighbour, Case Based Reasoning, Rough Set Approach.	2 Hours
4.3	The role of Genetic Algorithm and fuzzy logic; Prediction methods - Linear and nonlinear regression, Logistic Regression.	2 Hours
5	**Web mining and Data Mining for Business Intelligence Applications**	
5.1	Web Mining - Web mining introduction, Web Content Mining, Web Structure Mining, Web Usage mining, Automatic Classification of web Documents	2 Hours
5.2	Data mining for business Applications like Balanced Scorecard, Fraud Detection, Clickstream Mining	3 Hours
5.3	Data mining for market segmentation and retail industry	3 Hours
	Total	36 Hours

Course Code	Course Name	Category	L	T	P	Credit
20MBA303	e-BUSINESS	Elective	3	0	0	3

Preamble:

Upon successful completion of this course, the student will be able to understand the e-business concepts and how it is different from e-commerce. Moreover, the student will be able to comprehend the e-business models and infrastructure. Students will learn application of e-business concepts to different fields, such as: education, banking, tourism and so on. Over and above all, this course will inspire students with online business ideas and motivate them to apply what they learned in real life.

Prerequisite: NIL

Course Outcomes: After completion of the course the student will be able to

CO1	Explain the role of e-business and understand its challenges
CO2	Understand the e-business models and plan the strategies
CO3	Examine the e-market place and its functioning
CO4	Assess the applications of e-business and identify the security issues
CO5	Appraise the use of e-business in selected industries

Mapping of course outcomes with program outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	-	1	2	-
CO 2	1	-	-	3	1
CO 3	1	2	1	3	1
CO 4	3	1	2	3	1
CO 5	3	2	-	2	2

Assessment Pattern

Bloom's Category	Continuous Assessment Tests (in %)		End Semester Examination (in marks)
	1	2	
Remember	20	20	10
Understand	40	40	30
Apply	40	40	20
Analyze			
Evaluate	Can be done through Assignments/ Seminars/Mini Projects		
Create	Can be done through Assignments/ Seminars/Mini Projects		

Mark distribution

Total Marks	CIE	ESE	ESE Duration
100	40	60	3 hours

Continuous Internal Evaluation Pattern:

Attendance : 4 marks

Continuous Assessment Test (2 numbers) : 16 marks

Assignment/Quiz/Course project : 10 marks

Seminar and Discussion : 10 marks

End Semester Examination Pattern:

There will be three parts; Part A, Part B and part C. Part A contains 5 questions (one question each from each module) of 2 marks each (Students should answer all questions). Part B contains 5 questions (one question each from each module) of 10 marks each (Students have the choice of answering any three questions). Part C contains a compulsory question (can have sub-divisions) of 20 marks (from any of the modules or combination) may be in application-level or case study.

Model Question paper

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

TIHIRD SEMESTER MBA DEGREE EXAMINATION

20MBA303 e-BUSINESS

Max. Marks: 60 Duration: 3 Hours

PART A

Answer ***all*** questions. Each question carries 2 marks.

1. Define e-market place.
2. Classify the e-business models.
3. List the functions of e-markets.
4. What do you understand by e-procurement?
5. Recall the funding options for e-business startup.

(5x2 marks = 10 marks)

PART B

Answer any ***three*** questions. Each question carries 10 marks

6. a. Illustrate the strategic planning process. (5)
   b. Explain the theory of competitive strategy. (5)
7. a. Outline the functional characteristics of B-2-B e-markets. (6)
   b. Briefly explain the e-market success factors. (4)
8. a. Illustrate the security mechanisms for e-business. (3)
   b. Examine the reliability and quality aspects of e-business. (7)
9. a. Distinguish between e-commerce and e-business. (5)
   b. List the inhibitors of e-business. (5)
10. a. Critically appraise the Online banking and online personal finance benefits to customers. (7)
    b. Assess the impact of e business on tourism industry. (3)

(3x10 marks = 30 marks)

PART C

Answer *all* the questions. This section carries 20 marks

11. a. Justify the importance of e-business with reference to the Covid-19 pandemic taking the case of e-grocers. (15)
    b. Identify the risks and challenges involved in an e-business startup. (5)

(1X20 marks =20marks)

Syllabus	
Module 1	**Overview of e-Business** e-Business –e-Business vs. e-Commerce, Characteristics of e-Business, Elements of an e-Business solution, e- Business Models, Internet marketing and e-Tailing, e- Business roles and their challenges, e-Business requirements, Impacts of e-business, Inhibitors of e- Business; Define e-Marketplace and Describe their Functions; e-Marketplace types and their features.
Module 2	**e-Business Strategy** e-Business Strategy – Strategy, Strategic positioning, Levels of e-Business strategy, The strategic planning process, Strategic alignment, The Consequences of e- Business – theoretical foundation – Theory of competitive strategy, The resource-based view, Transaction cost economics; Success factors for implementation of e- Business strategies; **Business models** definition, classifications of business models – Internet-enabled business models, Value Web business models, The e-Business-enabled business models, Market participants business model, Cybermediaries business model; e-Business and value chain – The Business unit value chain, Value Chain Analysis, Value Stream Analysis, Unbundling the business unit value chain, the industry value chain.
Module 3	**e-Markets** Electronic Markets – Working, Functional characteristics of business-to-business e-Markets, Classification of electronic markets, Market making mechanisms, Biased or unbiased markets; Functions of electronic markets, electronic markets vs traditional markets, Personalization and customization, Information goods, Search, Transaction mechanisms, Price discovery, Facilitation, Electronic invoicing and payment; Effects of electronic markets - impact, stakeholders – buyers, suppliers, investors and service suppliers; e-Market success factors.
Module 4	**e-Business Applications, e-Procurement, e-Payment Systems and Security and Reliability of e-Business** Integration and e-Business suits; ERP, eSCM, CRM; e- Procurement definition, processes, methods and benefits; e-Payment; Reliability and quality considerations, quality requirements, trust, e-business risks; e-Business security– application security requirements, security mechanisms for e-Business; Realising a secure e-Business infrastructure – Infrastructure availability, Network level security, Secure communications, Digital certification and trusted third parties, Trust services overview.
Module 5	**e-Business and Selected Industries and e-Business Start-up** e-Tourism; Employment and Job Market Online; Online Real Estate; Online Publishing and e-Books; Banking and Personal Finance Online; On-Demand Delivery Systems and E-Grocers; Online Delivery of Digital Products; Entertainment; Media. e-Business Start-up–funding options; web site development basics, Search Engine Optimization (SEO); evaluate various e-Business websites on design criteria; Payment gateways; Challenges in e-Business; Risks involved in e-Business; Business Continuity.

Text Books
1. Parag Kulkarni, Sunita Jahirabadkar and Pradip Chande, E-Business, Oxford University Press India, 2013 2. Dave Chaffey, E - Business and E - Commerce Management: Strategy, Implementation and Practice, Pearson Education, 2013
References and Suggested Readings
1. Michael P. Papazoglou and Pieter M.A. Ribbers, e-Business – Organizational and Technical Foundations, John Wiley & Sons, 2009 2. Efraim Turban, Jae K. Lee, David King and, Michael Chung, Electronic Commerce: A Managerial Perspective, Pearson Education, 1999 3. William Horton and Katherine Horton, E-learning Tools and Technologies: A consumer's guide for trainers, teachers, educators, and instructional designers, Kindle Edition, Wiley Publishing, 2008 4. Thaer Sabri, e-Payments: A Guide to Electronic Money and On-line Payments, Butterworths Law, 2002 5. Michael E. Gerber, The E-Myth Revisited: Why Most Small Businesses Don't Work and What to Do About It, Harper Business, 2004 6. Ravi Kalakota and Marcia Robinson, e-Business: Roadmap for Success (Information Technology), Addison Wesley, 1999 7. Ohad Samet, Introduction to Online Payments Risk Management, Kindle edition, O'Reilly Media, 2013

Course Contents and Lecture Schedule

No	Topic	No. of Lectures
1	**Overview of e-Business**	
1.1	e-business Vs e-commerce and characteristics of e-business	2 Hours
1.2	e-business requirements and challenges	3 Hours
1.3	e-market place and functions	2 Hours
2	**e-Business Strategy and business models**	
2.1	e-business strategy and positioning	3 Hours
2.2	classification of e-business models	2 Hours
2.3	e-business and value chain	3 Hours
3	**e-Markets**	
3.1	electronic markets-functional characteristics	2 Hours

3.2	Personalisation and customisation, price discovery, electronic invoicing	3 Hours
3.3	stakeholders and e-market success factors	2 Hours
4	**e-Business Applications, e-Procurement, e-Payment Systems and Security and Reliability of e-Business**	
4.1	e-business suits -ERP, eSCM, CRM	2 Hours
4.2	e-procurement and e-payment	2 Hours
4.3	security and reliability in e-business	2 Hours
5	**e-Business and Selected Industries and e-Business Start-up**	
5.1	e-tourism, online job market, online real estate, online banking, online publishing	2 Hours
5.2	e-business startup- funding and challenges	3 Hours
5.3	risks in e-business, business continuity	3 Hours
	Total	36 Hours

Course Code	Course Name	Category	L	T	P	Credit
20MBA305	AI STRATEGIES FOR BUSINESS	Elective	3	0	0	3

Preamble: The course AI strategies for Business helps the students in making strategic decisions using these technologies, in terms of both impact on a business and technical feasibility. The purpose is to improve understanding of AI, discuss the many ways in which AI is being used in the industry, and provide a strategic framework on how to bring AI to the center of digital transformation efforts.

Prerequisite: NIL

Course Outcomes: After the completion of the course the student will be able to:

CO 1	Develop a unique understanding of AI's fundamental concepts and methods.
CO 2	Learn how to work effectively with data scientists.
CO 3	Acquire knowledge on Machine learning applications
CO 4	Learn how to apply AI-based methods to solving practical business problems
CO 5	Explore on how to build an AI-powered organisation

Mapping of course outcomes with program outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	2	2	1	1
CO 2	3	2	2	1	2
CO 3	3	2	2	1	1
CO 4	3	3	2	2	1
CO 5	3	2	1	2	2

Assessment Pattern

Bloom's Category	Continuous Assessment Tests (in %)		End Semester Examination (in marks)
	1	2	
Remember	20	20	10
Understand	40	40	30
Apply	40	40	20
Analyze			
Evaluate	Can be done through Assignments/ Seminars/Mini Projects		
Create	Can be done through Assignments/ Seminars/Mini Projects		

Mark distribution

Total Marks	CIE	ESE	ESE Duration
100	40	60	3 hours

Continuous Internal Evaluation Pattern:

Attendance : 4 marks
Continuous Assessment Test (2 numbers) : 16 marks
Assignment/Quiz/Course project : 10 marks
Seminar and Discussion : 10 marks

End Semester Examination Pattern:

There will be three parts; Part A, Part B and part C. Part A contains 5 questions (one question each from each module) of 2 marks each (Students should answer all questions). Part B contains 5 questions (one question each from each module) of 10 marks each (Students have the choice of answering any three questions). Part C contains a compulsory question (can have sub-divisions) of 20 marks (from any of the modules or combination) may be in application-level or case study.

Model Question paper

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER MBA DEGREE EXAMINATION

20MBA305- AI STRATEGIES FOR BUSINESS

Max. Marks: 60 Duration: 3 Hours

PART A

Answer ***all*** questions. Each question carries 2 marks.

1. List out the different types of machine learning.
2. Identify the five "V's" of data.
3. What does Machine Learning Model Accuracy Mean?
4. List four applications of AI in marketing domain.
5. Summarize the infrastructure requirements for AI.

(5x2 marks = 10 marks)

PART B

Answer any ***three*** questions. Each question carries 10 marks

6. Explain the benefits of AI for business.
7. What is predictive modelling used for? Explain with the help of few examples.
8. Discuss four Machine Learning applications in the world of finance.
9. Taking the example of any three VPA's, discuss their accessibility, advantages and disadvantages.
10. "How can we create an AI portfolio?

(3x10 marks = 30 marks)

PART C

Compulsory question. This question carries 20 marks

11. "AI disrupts and transforms businesses" Citing examples from the present business world analyse the above statement.

(1x20 marks = 20 marks)

Syllabus	
Module 1	**AI for Business** Introduction, AI as a General-Purpose Technology, Value of AI, Benefits for Business, Opportunities in AI, Trends in AI, AI human interface, Building trust. Machine Learning Overview, Types, Understand key terms and components involved in machine learning approaches, such as: algorithm, model, training, feature, test set, training set, and ground truth dataset.
Module 2	**Big Data and AI** Big Data Overview, Basics of Big Data and data infrastructure, five "V's" of data, Big Data Analysis: Extracting Intelligence from Big Data. AI changing business process, Key terms and concepts of Deep Learning, application to predictive modelling, reinforcement learning models applied to the complex optimization scenarios.
Module 3	**Machine learning Models** Accuracy of ML models, Specific ML Methods, ML in practice, Model Selection and Validation, applications of various machine learning capabilities, capabilities of natural language processing, voice/speech processing, and computer vision, machine learning system architectures for a digital channel chatbot, negotiation engine, and visual classifier. ML Applications in Finance: Fraud Detection. Business application ML in Personalization, Recommender Systems, Impact of recommenders on markets, Challenges with personalization.
Module 4	**Business Applications of AI** AI in marketing- customers acquisition and customer services, marketing research, virtual personal assistant, sales process. Role of AI in human resource management, AI tools for predictions, Scaling up business using AI methods. Artificial Intelligence in practical business settings by analyzing business cases- Hey Google vs. Alexa vs. Siri.
Module 5	**AI Strategy and Governance** AI Strategy and Governance Introduction, AI-Driven Business Transformation, Developing a Portfolio of AI Projects, Lowering Barriers for AI Use, AI in the Organization Structure, AI infrastructure requirements, The ethics of AI, common hurdles in implementing, Data readiness for implementation of particular ML/ AI capabilities, Case discussions on GOOGLE, FACEBOOK, AMAZON, APPLE Artificial Intelligence activities.

Text Book

1. Ethem Mining (2019). *Artificial Intelligence for Business Applications: Use Artificial Intelligence for Scaling Up Your Business*, Kindle Edition.
2. John Medicine (2019). *Artificial Intelligence for Business: A Modern Business Approach*, Kindle Edition.
3. Rajendra Akerkar (2019). *Artificial Intelligence for Business*, Springer.
4. Steven Finlay (2017). *Artificial Intelligence and Machine Learning for Business: A No-Nonsense Guide to Data Driven Technologies*, (2nd Edn.), Relativistic Books.

References and Suggested Readings

1. Doug Rose (2018). *Artificial Intelligence for Business: What You Need to Know about Machine Learning and Neural Networks*, Kindle Edition.
2. Alex Castrounis (2019). *AI for People and Business: A Framework for Better Human Experiences and Business Success* (1st Edn.), Oreilly.
3. Thomas H. Davenport (2018). *The AI Advantage: How to Put the Artificial Intelligence Revolution to Work*, MIT Press.
4. David B. Yoffie, Liang Wu, Jodie Sweitzer, Denzil Eden and Karan Ahuja (2018) *Voice War: Hey Google vs. Alexa vs. Siri*, Harvard Business School.
5. Adam Robert Pah, Alanna Lazarowich, Charlotte Snyder (2018). *Evaluating the Cognitive Analytics Frontier*, Kellogg School Case KEI046.
6. Cohen L., Malloy C. and Powley W., (2018). *Artificial Intelligence and the Machine Learning in Finance: Cogent Labs and the Google Cloud Platform (GCP),* by Harvard Business School.

Course Contents and Lecture Schedule

No	Topic	No. of Lectures
1	**AI for Business**	
1.1	Introduction	3 Hours
1.2	Benefits for Business, Opportunities and Trends in AI	2 Hours
1.3	Machine Learning Overview	2 Hours
2	**Big Data and AI**	
2.1	Basics of Big Data	3 Hours
2.2	Extracting Intelligence from Big Data	2 Hours
2.3	Deep learning applications	2 Hours
3	**Machine Learning Models**	
3.1	Applications of various machine learning capabilities	3 Hours
3.2	Natural language processing	3 Hours
3.3	Applications in Finance	2 Hours
4	**Business Applications of AI**	
4.1	AI in marketing	3 Hours
4.2	AI tools for predictions	2 Hours
4.3	Hey Google vs. Alexa vs. Siri	2 Hours
5	**AI Strategy and Governance**	
5.1	AI-Driven Business Transformation	3 Hours
5.2	Data readiness for implementation of particular ML/ AI capabilities	2 Hours
5.3	Case discussions on GOOGLE, FACEBOOK, AMAZON, APPLE Artificial Intelligence activities	2 Hours
	Total	36 Hours

Course Code	Course Name	Category	L	T	P	Credit
20MBA307	e- GOVERNANCE	Elective	3	0	0	3

Preamble: Electronic governance or e-governance can be defined as the usage of Information and Communication Technology (ICT) by the government to provide and facilitate government services, exchange of information, communication transactions and integration of various stand-alone systems and services. Main objectives of this course are to develop an understanding of the e-governance from a multi-disciplinary perspective, application of ICT in public governance systems, frameworks for such e-governance models, enabling technologies and contemporary trends.

Prerequisite: Nil

Course Outcomes (COs): After the completion of the course the student will be able to

CO 1	Understand the concept of e-governance and its importance in today's environment.
CO 2	Explain the various conceptual models of e-governance and its applications
CO 3	Analyse the various implementation possibilities of e-governance models.
CO 4	Explain the various requirements for e-governance implementation.
CO 5	Evaluate the various global successful e-governance models

Mapping of course outcomes with program outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	3	2	3	2
CO 2	3	2	2	3	3
CO 3	3	2	2	3	3
CO 4	3	3	3	2	2
CO 5	3	2	2	2	2

Assessment Pattern

Bloom's Category	Continuous Assessment Tests (in %)		End Semester Examination (in marks)
	1	2	
Remember	20	20	10
Understand	40	40	30
Apply	40	40	20
Analyze			
Evaluate	Can be done through Assignments/ Seminars/Mini Projects		
Create	Can be done through Assignments/ Seminars/Mini Projects		

Mark distribution

Total Marks	CIE	ESE	ESE Duration
100	40	60	3 hours

Continuous Internal Evaluation Pattern:

Attendance : 4 marks

Continuous Assessment Test (2 numbers) : 16 marks

Assignment/Quiz/Course project : 10 marks

Seminar and Discussion : 10 marks

End Semester Examination Pattern:

There will be three parts; Part A, Part B and part C. Part A contains 5 questions (one question each from each module) of 2 marks each (Students should answer all questions). Part B contains 5 questions (one question each from each module) of 10 marks each (Students have the choice of answering any three questions). Part C contains a compulsory question (can have sub-divisions) of 20 marks (from any of the modules or combination) may be in application-level or case study.

Syllabus

Model Question paper

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER MBA DEGREE EXAMINATION

20MBA307 e- GOVERNANCE

Max. Marks: 60 Duration: 3 Hours

PART A

Answer ***all*** questions. Each question carries 2 marks.

1. Define e-Governance
2. What is interactive service model?
3. Define census data
4. What is infrastructural readiness?
5. What is e-Khazana?

(5x2 marks = 10 marks)

PART B

Answer any ***three*** questions. Each question carries 10 marks

6. Explain in detail about various enablers of e-Governance. Briefly explain various issues in e-Governance implementation.
7. Illustrate in detail critical flow model of E-governance?
8. Explain how e-Governance model can be implemented for rural development.
9. Explain in detail regarding Technological Evolutionary Stages in E-Governance.
10. Discuss how e-Panchayat models are successfully implemented in India.

(3x10 marks = 30 marks)

PART C

Compulsory question. This question carries 20 marks

11. Evaluate a successful e-Governance model of any developed country and explain how the same kind of model can be implemented in a state like Kerala in various sectors by making necessary changes according to the state's requirements and limitations.

(1x20 marks = 20 marks)

Module 1	**Introduction** Need for e-governance, Evolution of E-Governance, Issues in E-Governance applications, Scope, Global trends, Benefits in cost, time, speed and quality- other issues- e-government enablers models. Merits and demerits of simulation, comparison between simulation and numerical methods.
Module 2	**Types and characteristics:** E-Governance Maturity Models- evolution- Levels- Characteristics - Good Governance Models- Digital Governance: Broadcasting/ Wider Dissemination Model, Critical Flow Model, Comparative Analysis Model, Mobilization and Lobbying Model, Interactive-service Model/ G2C2G
Module 3	**Areas of implementation:** Architectures for data warehouses for e-government- National Data Warehouses: Census Data, Prices of Essential Commodities -dashboards for online decision making-Other areas are Agriculture, Rural Development, Health, Planning, Education, and Trade and Other Sectors.
Module 4	**E-Governance requirements:** Infrastructure readiness - Digital System, Legal, Institutional, Human, Technological Evolutionary Stages in E-Governance.
Module 5	**Current Scenario:** Cases on e-literacy project in Kerala-Bhoomi in Karnataka, FRIENDS in Kerala, E-Khazana, DGFT, PRAJA, E-Seva, E-Panchyat, Mandals in Andra, Gyandoot, Computerised interstate check post in Gujarat- General Information Services of National Informatics Centre; Comparative study on E-Governance initiative in developing and developed countries like USA; E-China; Brazil and Sri Lanka.

Text Book and References

1. Bhatnagar Subhash (2004). *E-Government: From Vision to Implementation - A Practical Guide with Case Studies*, Sage Publication, New Delhi.
2. C.S.R. Prabhu (2004). *E-Governance: Concepts and Case Studies*, Prentice-Hall of India Private Limited.
3. Gupta D. N., (2008) *E-governance: A comprehensive framework*, New Century Publications India
4. Pankaj Sharma (2004). *E-Governance: The New Age Governance*, APH Publishing India.

References and Suggested Readings

1. Backus Michiel (2001). *e-Governance in Developing Countries*, IICD Research Brief, No. 1.
2. Leslie Budd and Lisa Harris (2009) *E-governance: Managing or Governing*, Routledge.
3. Driss Kettani and Bernard Moulin, (2014). *E Government for good governance in developing countrie*s, International Development Research Centre, Anthem Press

Course Contents and Lecture Schedule

No	Topic	No. of Lectures
1	**INTRODUCTION**	
1.1	Need for e-governance, Evolution of E-Governance, Issues in E-Governance applications, Its scope.	2 Hours
1.2	Global trends, Benefits in cost, time, speed and quality- other issues- e-government enablers models.	3 Hours
1.3	Merits and demerits of simulation, comparison between simulation and numerical methods	2 Hours
2	**TYPES AND CHARACTERISTICS**	
2.1	E-Governance Maturity Models-evolution- Levels-Characteristics - Good Governance Models	3 Hours
2.2	Digital Governance: Broadcasting/ Wider Dissemination Model, Critical Flow Model, Comparative Analysis Model	2 Hours
2.3	Mobilization and Lobbying Model, Interactive-service Model/ G2C2G	3 Hours
3	**AREAS OF IMPLEMENTATION**	
3.1	Architectures for data warehouses for E-government- National Data Warehouses	2 Hours
3.2	Census Data, Prices of Essential Commodities -dashboards for online decision making	2 Hours
3.3	Other areas are Agriculture, Rural Development, Health, Planning, Education, and Trade and Other Sectors.	3 Hours
4	**E-GOVERNANCE REQUIREMENTS**	
4.1	Infrastructure readiness - Digital System	2 Hours
4.2	Legal, Institutional, Human Aspects	2 Hours
4.3	Technological Evolutionary Stages in E-Governance.	2 Hours
5	**CURRENT SCENARIO**	
5.1	Cases on e-literacy project in Kerala-Bhoomi in Karnataka, FRIENDS in Kerala, E-Khazana, DGFT, PRAJA	2 Hours
5.2	E-Seva, E-Panchyat, Mandals in Andra, Gyandoot, Computerised interstate check post in Gujarat- General Information Services of National Informatics Centre	3 Hours
5.3	Comparative study on E-Governance initiative in developing and developed countries like USA; E- China; Brazil and Sri Lanka	3 Hours
	Total	36 Hours

Course Code	Course Name	Category	L	T	P	Credit
20MBA309	SIMULATION FOR MANAGERS	Elective	3	0	0	3

Preamble: Simulation is used to model efficiently a wide variety of systems that are important to managers. A simulation is basically an imitation; a model that imitates a real-world process or system. In business and management, decision makers are often concerned with the operating characteristics of a system. Management simulation games bring an experiential aspect to learning about complex systems. This type of action learning has more impact on students than simply listening to a lecture or engaging in a case study discussion. Students who participate in a simulation can see the immediate consequences of their decisions and learn what it's truly like to juggle competing priorities amidst a constant influx of information.

Prerequisite: NIL

Course Outcomes: After the completion of the course the student will be able to:

CO 1	Explain the concepts and theories associated with systems approach in decision making
CO 2	Define all the conceptual models of random number generation and decision-making process.
CO 3	Apply the logic of different simulation models to solve various business scenario by taking appropriate decisions
CO 4	Analyse various business decision simulation models according to its use in different scenario.
CO 5	Evaluate the various discrete event simulation models in decision making.

Mapping of course outcomes with program outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	3	2	3	2
CO 2	2	2	2	3	3
CO 3	3	2	2	3	3
CO 4	2	3	3	2	2
CO 5	3	2	2	3	3

Assessment Pattern

Bloom's Category	Continuous Assessment Tests (in %)		End Semester Examination (in marks)
	1	2	
Remember	20	20	10
Understand	40	40	30
Apply	40	40	20
Analyze			
Evaluate	Can be done through Assignments/ Seminars/Mini Projects		

Create	Can be done through Assignments/ Seminars/Mini Projects

Mark distribution

Total Marks	CIE	ESE	ESE Duration
100	40	60	3 hours

Continuous Internal Evaluation Pattern:

Attendance : 4 marks

Continuous Assessment Test (2 numbers) : 16 marks

Assignment/Quiz/Course project : 10 marks

Seminar and Discussion : 10 marks

End Semester Examination Pattern:

There will be three parts; Part A, Part B and part C. Part A contains 5 questions (one question each from each module) of 2 marks each (Students should answer all questions). Part B contains 5 questions (one question each from each module) of 10 marks each (Students have the choice of answering any three questions). Part C contains a compulsory question (can have sub-divisions) of 20 marks (from any of the modules or combination) may be in application-level or case study.

Syllabus

Model Question paper

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER MBA DEGREE EXAMINATION

20MBA309- SIMULATION FOR MANAGERS

Max. Marks: 60 Duration: 3 Hours

PART A

Answer ***all*** questions. Each question carries 2 marks.

1. Define system modelling
2. What is arrival process generation?
3. Define distributed lag model
4. What is dynamic system?
5. What is hand simulation?

(5x2 marks = 10 marks)

PART B

Answer any ***three*** questions. Each question carries 10 marks

6. Explain in detail about the various areas of application of simulation. Detail about the various steps involved in simulation study.
7. Differentiate between defects and defectives and its application?
8. What is Cobweb model? Briefly explain its application in decision making.
9. Discuss the effects of dynamic interaction. Briefly describe any one of the Supply Chain Simulation models.
10. Explain how a simulation model can be verified and validated.

(3x10 marks = 30 marks)

PART C

Compulsory question. This question carries 20 marks

11. Analyse in detail regarding Beer game model by conducting a hand simulation, assuming random data. Explain its importance in supply chain management.

(1x20 marks = 20 marks)

Module 1	**Systems:** Systems theories, System modelling, system analysis, system postulation, system synthesis, systems approach to problem solving, applications in industrial and business systems. Areas of application of simulation, steps in simulation study, classification of systems, different types of system models. Merits and demerits of simulation, comparison between simulation and numerical methods.
Module 2	**Random Numbers and random variates:** Uniformly distributed random numbers, properties of random numbers, generation of Pseudo-Random numbers (concepts only) and testing of randomness, Generation of random processes: random walk (one dimensional only), demand processes, lead time generation, arrival process generation, service activity generation, defects and defectives generation.
Module 3	**Types of Simulation:** Monte-Carlo method, Distributed Lag models, Cobweb models. Continuous system models, feedback systems, Real-time simulation. Use of Monte Carlo method to approximate solutions and games applied to business situations. Modelling of uncertainty in maintenance and inventory systems, stock price fluctuation, demand process and market price.
Module 4	**Dynamic Business Systems:** Business dynamics, properties of dynamic systems, effects of dynamic interactions - learning disabilities and System archetypes. Modelling of dynamic systems- tools of modelling - stock and flows & causal relations. Simulation of dynamic systems: Basic models and behaviour patterns, Beer Game modelling and analysis. Examples of product growth model and the manufacturing Supply Chain models.
Module 5	**Discrete Event Simulation:** Next-Event approach/Event scheduling, Fixed Time Increment method. Hand simulation of Queuing models, Business systems and Service models, other business system models. Concepts of Verification and Validation of models, statistical analysis of outputs.

Text Book

1. Narsingh Deo, (2004). *System Simulation with Digital Computer*, PHI
2. Geoffrey Gordon, (2002). *System Simulation*, PHI

References and Suggested Readings

1. John D. Sterman, (2010). *Business dynamics: systems thinking and modeling for a complex world*, Tata-McGraw Hill.
2. Sheldon M. Ross, (2006). *Simulation*, Elsevier.
3. Jerry Banks, John S. Carson, Barry L. Nelson, David M. Nicol (2010). *Discrete Event System Simulation*, Pearson Education.

Course Contents and Lecture Schedule

No	Topic	No. of Lectures
1	**Systems**	
1.1	Systems theories, System modelling, system analysis, system postulation, system synthesis, systems approach to problem solving, applications in industrial and business systems.	2 Hours
1.2	Areas of application of simulation, steps in simulation study, classification of systems, different types of system models.	3 Hours
1.3	Merits and demerits of simulation, comparison between simulation and numerical methods.	2 Hours
2	**Random Numbers and Random Variables**	
2.1	Uniformly distributed random numbers, properties of random numbers, generation of Pseudo-Random numbers (concepts only) and testing of randomness	3 Hours
2.2	Generation of random processes: random walk (one dimensional only), demand processes, lead time generation	2 Hours
2.3	Arrival process generation, service activity generation, defects and defectives generation.	3 Hours
3	**Types of Simulation**	
3.1	Monte-Carlo method, Distributed Lag models, Cobweb models. Continuous system models, feedback systems, Real-time simulation	2 Hours
3.2	Use of Monte Carlo method to approximate solutions and games applied to business situations.	2 Hours
3.3	Modelling of uncertainty in maintenance and inventory systems, stock price fluctuation, demand process and market price.	3 Hours
4	**Dynamic Business Systems**	
4.1	Business dynamics, properties of dynamic systems, effects of dynamic interactions - learning disabilities and System archetypes	2 Hours
4.2	Modelling of dynamic systems- tools of modelling - stock and flows & causal relations. Simulation of dynamic systems	2 Hours
4.3	Beer Game modelling and analysis. Examples of product growth model and the manufacturing Supply Chain models.	2 Hours
5	**Discrete Event Simulation**	
5.1	Next-Event approach/Event scheduling, Fixed time increment method	2 Hours
5.2	Hand simulation of Queuing models, Business systems and Service models, other business system models	3 Hours
5.3	Concepts of Verification and Validation of models, statistical analysis of outputs.	3 Hours
	Total	36 Hours