

**Adikavi Nannaya University, Rajahmundry**  
**MCA III Semester**  
**3.1 Computer Networks (Model Question Paper)**

Time : 3 Hours

Max. Marks : 75

**SECTION – A ( 4X15=60 Marks)**  
**Answer ALL Questions**

1. a) With a neat block diagram explain the TCP/IP reference model. List out the limitations of the model. [15]  
(OR)  
(b) What are the functions of the physical layer?  
(c) Give the physical description, characteristics, and uses of all the guide transmission media. [5+10]
- 2 (a) Explain Sliding Window Protocol  
(b) Differentiate Error detection and Correction Codes [8+7]  
(OR)  
(c) Explain Link State Routing Protocol  
(d) What are the methods of congestion control in datagram subnets [10+5]
- 3 (a) what is TCP protocol? How is connection management done by TCP?  
(b) Explain how TCP controls congestion [8+7]  
(OR)  
(c) Explain SMTP and MIME [15]
- 4(a) Compare the different network devices [15]  
(OR)  
(b) Write brief notes on Mobile Adhoc Networks and Sensor networks [15]

**SECTION – B (5X3=15 Marks)**  
**Answer any FIVE Questions**

- 5.
- (a) ATM Reference Model
  - (b) Explain Frequency Division Multiplexing
  - (c) Give the format of IPv4 header
  - (d) IPv4 Address Classes
  - (e) What are the various timers used by TCP and what are their purposes?
  - (f) Difference between TCP and UDP
  - (g) Short Notes on Firewalls
  - (h) Wireless Access Points

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**3.2 Artificial Intelligence and Expert Systems ( Model Question Paper)**

Time : 3 Hours

Max. Marks : 75

**SECTION – A ( 4X15=60 Marks)**  
**Answer ALL Questions**

1. a) Describe any one informed search strategy and uninformed search strategy.  
(OR)  
b) Explain four basic kinds of agents that underlie almost all intelligent systems.
2. a) Explain how optimal strategies lead to optimal decisions in games.  
(OR)  
b) Describe resolution and unification
3. a) Explain different approaches to uncertain reasoning.  
(OR)  
b) Describe multi attribute utility functions
4. a) Explain the stages in the development of an expert system.  
(OR)  
b) Briefly explain the concept of neural networks.

**SECTION – B (5X3=15 Marks)**  
**Answer any FIVE Questions**

5.
  - a) Define AI. What is Turing Test?
  - b) Specify the basic components of a problem.
  - c) Write a short notes on CSP.
  - d) Give the BNF of sentences in propositional logic.
  - e) Axioms of probability.
  - f) Axioms of utility theory.
  - g) Applications of expert systems
  - h) Frames

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**3.3 Design and Analysis of Algorithms (Model Question Paper)**

Time : 3 Hours

Max. Marks : 75

**SECTION – A ( 4X15=60 Marks)**  
**Answer ALL Questions**

1. a) Define Algorithm. Explain fundamentals of Algorithmic problem solving.  
(OR)  
b) Define space and time complexity. Explain different types of Asymptotic notations.
2. a) Explain divide and conquer solution for quick sort. Illustrate with examples.  
(OR)  
b) Explain DFS and BFS search using decrease and conquer technique with examples .
3. a) Explain Floyd's algorithm for all-pairs shortest path problem with an example.  
(OR)  
b) Explain Greedy method .Discuss Krushkal's algorithm for minimum spanning tree.
4. a) Explain NP-Complete and NP-Hard problems.  
(OR)  
b) Explain n-queen problem using backtracking technique.

**SECTION – B (5X3=15 Marks)**  
**Answer any FIVE Questions**

5. a). Analysis of recursive algorithm.  
b) Strassen's matrix multiplication.  
c) Binary search algorithm.  
d) Horner's rule.  
e) Horspool's algorithm.  
f) Dijkstra's algorithm.  
g) Decision tree.  
h) Hamiltonian circuit problem.

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**MCA III Semester**  
**3.4 Operating Systems**

Time : 3 Hours

Max. Marks : 75

**SECTION – A ( 4X15=60 Marks)**  
**Answer ALL Questions**

1. Write short note on (5\*3=15)
    - a) i) Mainframe Systems      ii) Multiprocessor Systems
    - iii) Distributed Systems      iv) Real Time Systems
    - v) Functions of OS

(OR)

    - b) i) Write short notes on System calls.
    - ii) Explain System Structure. [8+7]
  2. a) i) Explain Interprocess Communications.
  - ii) Write short notes on communication in Client-Server Systems. [9+6]
- (OR)
- b) Compare and Construct preemptive and non-preemptive scheduling algorithms.
3. a) Write a short notes on Demand Paging and Segmentation.
- (OR)
- b) i) Explain various Page Replacement Algorithms.
  - ii) Write a short notes on Disk Management and Disk Scheduling. [8+7]
4. a) Describe protections concepts and mechanisms provided by an operating system.
- (OR)
- b) Explain OS Concepts with respect to LINUX.

**SECTION – B (5X3=15 Marks)**  
**Answer any FIVE Questions**

5. a) Threads
- b) Dining Philosophers Problem
- c) Paging
- d) File Operations
- e) Process
- f) Methods for Handling Deadlocks
- g) Directory Structure
- h) User Authentication

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**3.5 Web Technologies (Model Question Paper)**

Time : 3 Hours

Max. Marks: 75

**SECTION – A ( 4X15=60 Marks)**  
**Answer ALL Questions**

1. a) i) Explain the different layers and their roles in protocols of Computer Communication.  
ii) What are the types of Bridges? Explain Simple Bridge? [10+5]

(OR)

- b) Explain the concepts of data fragmentation and reassembly in detail.  
2. a) i) How does the three way Handshake technique help in creating a TCP connection?  
ii) Explain the concept of FTP (File Transfer Protocol)? [7+8]

(OR)

- b) i) Describe the steps involved when a web browser request for and obtains a web page from a Web server?  
ii) What are the three approaches for e-Commerce application Development and Explain Main features of a product such as IBM's Net. Commerce? [7+8]  
3. a) i) Describe how static Web pages are made dynamic?  
ii) Create web pages for MOOCs with relevant fields. [8+7]

(OR)

- b) i) What are the advantages of Client - side scripting?  
ii) Describe ADO and how it can be used to interact with Databases? [7+8]  
4. a) i) Describe the typical operation involving a middleware such as CORBA?  
ii) Explain the concept of EDI? [7+8]

(OR)

- b) i) Describe the anatomy of an XML Document?  
ii) Explain WAP Architecture? [7+8]

**SECTION – B (5X3=15 Marks)**  
**Answer any FIVE Questions**

5. a) What is ICMP?  
b) Describe Spooling in brief?  
c) What is Resolver?  
d) What are Java Beans?  
e) What is the need for XSL? Illustrate this with the help of an example?  
f) Explain GPRS and UMTS?  
g) Life cycle of JAVA applet.  
h) JAVA Remote Method Invocation.