MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
MCA I Year I Semester (R20) Regular End Semester Examinations - September 2021
(Regulations: R20)
OPERATING SYSTEMS

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part-A or B only

Q.1(A) Explain the following operating systems   12M
   i)   Real time systems
   ii)   Multi Programmed
   iii)   Time shared

OR

Q.1(B) What is system call? Explain different types of system call.   12M

Q.2(A) What is Deadlock? Explain with example.   12M

OR

Q.2(B) Explain different types of process scheduling algorithms with example. 12M

Q.3(A) Explain the following   12M
   i)   File access Methods
   ii)   Free space management

OR

Q.3(B) Explain various disk scheduling algorithms.   12M

Q.4(A) Explain the following in UNIX   12M
   i)   Grep command
   ii)   Vi Editor

OR

Q.4(B) Explain different network commands in Unix.   12M

Q.5(A) Explain the different operators in Unix.   12M

OR

Q.5(B) Explain the following with examples.   12M
   i)   Shell variables
   ii)   Command line editing

*** END***

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PROGRAMMING WITH C++

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part-A or B only

Q.1(A)	i) How data and functions are organized in Object Oriented Program? Explain with an example.	6M
	ii) What is type conversion and write the example program on type cast	6M
	OR	
Q.1(B)	i) Differentiate between while and do-while loop and give an example.	5M
	ii) Explain about string manipulation functions with examples.	7M
Q.2(A)	i) Explain about pass by value and pass by reference parameter passing mechanism with suitable example programs.	6M
	ii) Explain about Friend functions and Inline functions.	6M
	OR	
Q.2(B)	Explain explicit Constructors, Parametrized Constructors, and multiple Constructors with suitable example.	12M
Q.3(A)	i) What are the differences between function overloading and operator overloading with the suitable c++ example programs	6M
	ii) Write a C++ Program to store GPA (Grade Point Average) of n number of students and display it using new and delete operator.	6M
	OR	
Q.3(B)	Illustrate different type of inheritance with suitable example.	12M
Q.4(A)	Write a C++ program to create a template T for a class named pair having two data members of type T which are inputted by a constructor and a member function get-max () return the greatest of two numbers to main.	8M 4M
	OR	
Q.4(B)	What is an Inheritance and write a c++ program to satisfy "virtual functions are hierarchical" concept	12M
Q.5(A)	What is an Exception handing? Write a C++ program to satisfy "one try block having multiple catch block" concept.	12M
	OR	
Q.5(B)	Explain the process of open, read, write and close files?	12M

*** END***

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MATHEMATICAL FOUNDATIONS FOR COMPUTER APPLICATIONS

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part-A or B only

Q.1(A)	(i) Construct the truth table for $(P \to Q) \wedge (Q \to R) \wedge (P \to R)$	6M
	(ii) Prove that $\neg(P \wedge Q) \Leftrightarrow (\neg P \vee \neg Q)$	6M

OR

Q.1(B)	(i) Let $X = \{2, 3, 6, 12, 24, 36\}$ and the relation $\leq$ be such that $x \leq y$ if x divides y. Draw the Hasse diagram of $\langle X, \leq \rangle$.	6M
	(ii) Consider the poset ({3,4,9,15,24,45}, /) that is the divisibility relation. Draw its Hasse diagram.	6M

Q.2(A)	i. Explain with examples: Graph, Weighted Graph, Planar Graph.	6M
	ii. What is a tree? Explain with an example.	6M

OR

Q.2(B)	i. What is meant by prefix code? Explain with an example.	6M
	ii. Describe Path in a graph, Circuit in a graph, Directed Graph with examples.	6M

Q.3(A)	i. Draw Box and Whisker plot diagram and its characteristics.	6M
	ii. Explain about Ogives with example.	6M

OR

Q.3(B) The heights (in centimetres) and weight (in kilograms) of 10 basketball players on a team are: 12M

Height (X)	186	189	190	192	193	193	198	201	203	205
Weight (Y)	85	85	86	90	87	91	93	103	100	101

Calculate correlation coefficients.

Q.4(A) i) In studying the causes of power failures, these data have been gathered: 5% are due   12M
to transformer damage, 80% are due to line damage, 1% involves both problems. Based
on these percentages, approximate the probability that a given power failure involves
    a.   Line damage given that there is a transformer damage
    b.   Transformer damage given that there is line damage
    c.   Transformer damage but not line damage
    d.   Transformer damage given that there is no line damage
    e.   Transformer damage or line damage

OR

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COMPUTER ORGANIZATION AND ARCHITECTURE

Time: 3Hrs **Max Marks: 60**

> Attempt all the questions. All parts of the question must be answered in one place only.
> **In Q.no 1 to 5 answer either Part-A or B only**

Q.1(A) Converts the following decimal numbers to Binary, Decimal to Hexadecimal, and Decimal to Octal. **12M**
i. 32
ii. 89
iii. 298
vi. 432

OR

Q.1(B) What is flip flop? Explain different types of Flip flops. **12M**

Q.2(A) Explain different types of registrar architecture with neat diagram. **12M**

OR

Q.2(B) Define addressing modes. Give the details of different addressing modes. **12M**

Q.3(A) Explain the concept of exception handling in pipelining. **12M**

OR

Q.3(B) What is data hazard? Explain how data hazards will effect on instruction execution. **12M**

Q.4(A) Differentiate the characteristics of SRAM & DRAM. **12M**

OR

Q.4(B) What is RAID? Explain RAID levels in details. **12M**

Q.5(A) Explain the details of standard I/O interfaces. **12M**

OR

Q.5(B) Explain working principle of Direct Memory Access (DMA) with neat diagram. **12M**

*** END***

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OBJECT ORIENTED SOFTWARE ENGINEERING

Time: 3Hrs　　　　　　　　　　　　　　　　　　　　　　　　Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **In Q.no 1 to 5 answer either Part-A or B only**

Q.1(A)	Compare and contrast the Object-Oriented methodology of Booch, Rumbaugh and Jacobson.	12M
	OR	
Q.1(B)	Explain Agile process with its advantage. Explain any one Agile process model.	12M
Q.2(A)	i. What is Software requirement? Discuss Functional and Non-Functional requirements.	6M
	ii. Describe the different characteristics of a good requirement.	6M
	OR	
Q.2(B)	i. Define Use Case diagram. How do you create Use Case scenario matrix. Give an example.	6M
	ii. Draw Use Case diagram for Library Management System.	6M
Q.3(A)	With a neat sketch, discuss the Interaction diagrams with an example.	12M
	OR	
Q.3(B)	i. What is Activity diagram? What are the elements used in Activity diagram, explain each?	6M
	ii. Draw the Activity diagram of Automatic Teller Machine.	6M
Q.4(A)	Explain in detail about Software Quality Models.	12M
	OR	
Q.4(B)	i. Distinguish between Coupling and Cohesion metrics.	6M
	ii. Describe the Software Quality Metrics based on defects.	6M
Q.5(A)	a. Explain the techniques of Software verification.	6M
	b. Write short notes on Regression Testing.	6M
	OR	
Q.5(B)	i. How to design the test cases in State-Based testing with an example?	6M
	ii. What is Software maintenance? List the different categories of Software maintenance and explain each.	6M

*** END***

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COMPUTER NETWORKS

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part-A or B only

Q.1(A)   Explain ISO/ OSI reference model with neat diagram.   12M

OR

Q.1(B)   What is meant by topology? And explain the topologies of the network.   12M

Q.2(A)   Discuss in detail about CSMA Protocol.   12M

OR

Q.2(B)   Explain Sliding Window Protocol with their advantages and disadvantages.   12M

Q.3(A)   Explain Link State algorithm.   12M

OR

Q.3(B)   Explain in detail Switching concepts.   12M

Q.4(A)   Explain in detail about Transmission Control Protocol.   12M

OR

Q.4(B)   Discuss in detail about User datagram protocol.   12M

Q.5(A)   Explain symmetric and asymmetric cryptography algorithms with examples.   12M

OR

Q.5(B)   What is firewall? Explain the types of firewalls in detail.   12M

*** END***