MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

MCA II Year I Semester (R16) Regular End Semester Examinations – Dec 2017
(Regulations: R16)

DATA STRUCTURES THROUGH PYTHON

Time: 3Hrs   Max Marks: 50

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) Describe operator precedence in python.	5M
	ii) Define module? Explain time module in python.	1M+4M
	OR	
Q.1(B)	i) What is chained conditional in python? Write its syntax and suitable code.	1M+4M
	ii) Write python program to generate 10 random numbers between 1&100.	
		5M
Q.2(A)	i) Define class and instance object? How do you create them in python? Give suitable examples.	1M+4M
	ii) What is static class member? Explain with suitable python code.	1M+4M
	OR	
Q.2(B)	i) What is type conversion function? Explain with suitable program	1M+4M
	ii) What is sequence in python? Write a program to implement sequence	1M+4M
Q.3(A)	i) Explain the evaluation of expressions.	5M
	ii) Write a python program to find smallest element among the elements of given one dimensional array.	5M
	OR	
Q.3(B)	i) What is stack? Explain stack as an ADT.	1M+4M
	ii) What are the various operations of array? Write algorithm and program to implement the operations.	1M+4M
Q.4(A)	i) Describe limitations of array implementation.	5M
	ii) What is queue? Explain linked implementation queues.	1M+4M
	OR	
Q.4(B)	i) Write python code to insert and delete nodes in single linked list.	6M
	ii) Describe applications of linked lists.	4M
Q.5(A)	i) What is Red Black tree? Explain its properties and give example.	1M+4M
	ii) What is AVL tree? Explain its operations.	1M+4M
	OR	
Q.5(B)	Write short notes on	5M+5M
	i)indexed sequential search ii) interpolation search	

*** END***

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MCA II Year I Semester (R16) Regular End Semester Examinations –Dec 2017
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COMPUTER NETWORKS

Time: 3Hrs   Max Marks: 50

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)   What is the significance of layered architecture? Explain the OSI layered architecture with neat sketch.   10M

OR

Q.1(B)   Explain the principle differences between connection-oriented communication and connectionless communication   10M

Q.2(A)   Give explanation about copper cables with neat sketch.   10M

OR

Q.2(B)   Explain the significance of Switching? What are different switching techniques used in computer networks? Discuss   10M

Q.3(A)   i. Explain the working carrier sense multiple access protocol.   4M
           ii. How does a Token Ring LAN operate? Discuss.   6M

OR

Q.3(B)   How does work on functioning of Wireless LAN in detail.   10M

Q.4(A)   Write Short notes on   10M
         i.   SNMP
         ii.   ICMP

OR

Q.4(B)   How DNS service maps Domain Names to IP address ?Explain   10M

Q.5(A)   How does SHA-I Algorithm work? Explain with an Example.   10M

OR

Q.5(B)   Explain how Network Security can be achieved. Discuss with example.   10M

*** END***

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SOFTWARE ENGINEERING

Time: 3Hrs

Max Marks: 50

> 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)	What is Software Engineering? Explain the principles and practices of Software Engineering.	10M

OR

Q.1(B)	Write about Agile Development.	10M

Q.2(A)	With an example, explain the Functional and Non Functional requirements.	10M

OR

Q.2(B)	In detail write about Software Architecture.	10M

Q.3(A)	Define various steps of Interface designing.	10M

OR

Q.3(B)	Define various patterns of component Level design.	10M

Q.4(A)	What is testing? Write about unit testing and Integration testing.	10M

OR

Q.4(B)	Define the strategy of testing an Object Oriented Programming Application.	10M

Q.5(A)	What is a metric? Write about software engineering metrics.	10M

OR

Q.5(B)	In detail explain the process of Reengineering.	10M

*** END***

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DESIGN AND ANALYSIS OF ALGORITHMS

Time: 3Hrs   Max Marks: 50

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 briefly the Time Complexity estimation, space complexity estimation and the   6M
tradeoff between Time and Space complexity.
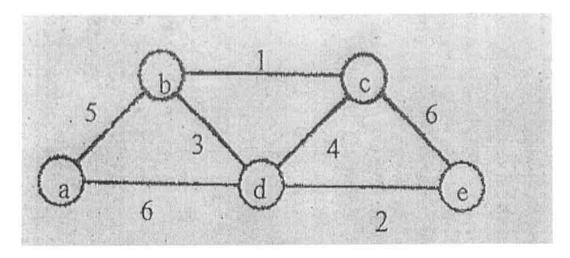Write the recursive Fibonacci algorithm and its recurrence relations.   4M

OR

Q.1(B) Explain the heap sorting algorithm with an example.   6M
Write the asymptotic notations for heap sort algorithm and explain its analysis.   4M

Q.2(A) Explain merge sort algorithm with suitable example and also discuss its time   10M
complexity.

OR

Q.2(B) Apply Kruskal's algorithm to find a minimum spanning tree of the following graph   10M

Q.3(A) Write and explain the algorithm to compute the all pairs source shortest path using   10M
dynamic programming. (5)
For the following graph having four nodes represented by the matrix given below
determine the all pairs source shortest path (5)

$$\begin{matrix} 0 & \infty & 3 & \infty \\ 2 & 0 & \infty & \infty \\ \infty & 7 & 0 & 1 \\ 6 & \infty & \infty & 0 \end{matrix}$$

OR

Q.3(B) Differentiate BFS and DFS.   5M
Distinguish between backtracking and branch – and bound techniques.   5M

Q.4(A)   Explain the algorithm using Backtracking technique to solve Graph coloring problem.   10M

OR

Q.4(B)   Solve the Travelling Salesman problem using branch and bound algorithm   10M

Q.5(A)   Differentiate between NP-Complete and NP-hard problems. Give example for each.   10M

OR

Q.5(B)   How to solve NP problem using Cliques decision problem?   10M

*** END***

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FINANCIAL ACCOUNTING FOR MANAGERS

Time: 3Hrs   Max Marks: 50

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)	Define Accounting. Discuss the objectives and importance of accounting.	10M

OR

Q.1(B)	Write brief notes on: i) Single entry system versus Double entry system ii) Golden rules of debit and credit	10M

Q.2(A)	Why trial balance is not the conclusive evidence of arithmetical accuracy of the books of accounts? Explain.	10M

OR

Q.2(B)	From the following Trial Balance of Shukla, prepare Trading and Profit and Loss Account for the year ending 31st March 2016 and Balance Sheet as on that date	10M

Particulars	Dr (Rs)	Cr (Rs)
Buildings	2,00,000	
Capital A/C		6,00,000
Purchases and Sales	90,000	3,00,000
Opening Stock (01-04-2015)	50,000	
Debtors and Creditors	1,30,000	60,000
Drawings A/C	40,000	
Sales returns and Purchase returns	20,000	5,000
Freight	25,000	
Office Salaries	80,000	
Wages	15,000	
Postage and Telegrams	10,000	
Machinery	1,50,000	
Bills receivable & Bills Payable	80,000	20,000
Advertisement	20,000	
Cash in hand	33,000	
Loose Tools	42,000	
Total	**9,85,000**	**9,85,000**

Adjustments: i) Closing Stock was valued at Rs.6000/- ii) Depreciate Buildings by 10% iii) Loose Tools are valued at Rs.38,000/-

Q.3(A)	What are the methods of inventory valuation? Explain any three methods of your choice.	10M

OR

Q.3(B)	What is depreciation? Explain the causes and objectives of depreciation.	10M

Q.4(A) Distinguish between funds flow statement and cash flow statement.   10M

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

Q.4(B) From the following Balance Sheet of X Ltd. Co as on 31st December 2005 and 2006.   10M
        You are required to prepare the statement of changes in working capital and funds
        flow statement.

Liabilities	2005	2006	Assets	2005	2006
Share Capital	1,00,000	1,00,000	Goodwill	12,000	12,000
General Reserve	14,000	18,000	Buildings	40,000	36,000
P& L Account	16,000	13,000	Plant	37,000	36,000
Sundry Creditors	8,000	5,400	Investments	10,000	11,000
Bills Payable	1,200	800	Stock	30,000	23,000
Provision for Taxation	16,000	18,000	Debtors	18,000	19,000
Outstanding expenses	400	600	Bills Receivables	2,000	3,200
			Cash Balance	6,600	15,200
	1,55,600	1,55,800		1,55,600	1,55,800

Q.5(A) What is bank reconciliation statement? How can you prepare the bank reconciliation   10M
        statement? Explain.

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

Q.5(B) From the following Balance Sheet calculate: 10M
        i)   Current Ratio.
        ii)   Liquid Ratio.
        iii) Cash ratio
        iv)   Debt-equity Ratio.

Liabilities	Rs.	Assets	Rs.
Equity share capital	1,00,000	Cash in hand	2,000
6% preference share capital	1,00.000	Cash at Bank	10,000
7% Debentures	40,000	Bills receivable	30,000
8% Public debt	20,000	Investments	20,000
Bank over draft	40,000	Sundry debtors	70,000
Sundry Creditors	60,000	Closing stock	40,000
Outstanding expenses	7,000	Plant and Machinery	1,00,000
Proposed dividend	10,000	Furniture	30,000
Reserves	1,50,000	Land and Buildings	2,20,000
Provision for taxation	20,000	Goodwill	35,000
Profit & loss account	20,000	Preliminary expenses	10,000
	5,67,000		5,67,000

<div align="center">*** END***</div>