

K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)

End Semester Exam
Nov – Dec 2017

Max. Marks:100

Class: FY M.Tech

Name of the Course: Network Design and Management

Course Code: IPCEE102

Duration: 3Hrs.

Semester: I

Branch: Computer

Instructions:

- (1) All Questions are Compulsory
- (2) Draw neat diagrams
- (3) Assume suitable data if necessary

Question No.		Max. Marks
Q.1(a)	The college has a library, office, exam section and 5 departments which need to be interconnected via LAN, to internet. The library, office and server room are on the 1 st floor while every other department is housed on separate floors. Four servers are to be configured and installed in the server room. The same management has another campus 15 Kms away which is already networked. Both the campuses need to be connected. A mail-server cum web server is to be hosted at the new campus. Design the complete Access layer, Backbone layer, and Core layer of this network. Note: you can make necessary assumption for number of laboratories in each department and number of PC's and other network resources needed.	15
Q.1(b)	There are three remote sites single-homed into a backbone node. Each remote site is connected via a T1 (1536kbps) and each T1 has an average utilization of 30 percent. Your design objective is to have trunk ports designed for an average utilization of 50 percent. How many T1 trunk ports are required?	5
Q.2	Explain different Backbone topologies along with its advantages and disadvantages. OR Which networking equipment is usually found in the core campus network? List different criteria for selecting the network media. Which media is best choice in a campus network?	10
Q.3(a)	Discuss the technical challenges and requirements which a network designer must understand while designing the network.	10
Q.3 (b)	Explain continuous and discrete Markov process. OR What are different causes of delay? What is the impact of delay and impact of loss on application?	10
Q.4(a)	Describe goals, organization and functions of network management with neat labelled diagram.	10
Q.4(b)	What is remote monitoring? Discuss RMON1 groups and functions.	10

Q.4(c)	<p>What are the features of SNMP v2 different from Version 1. Give the architecture of SNMP-v2.</p> <p style="text-align: center;">OR</p> <p>Describe the information model of SNMP v1. What are the managed objects? How are they defined?</p>	10
Q.5	What is the necessity of TMN? Describe the functional architecture of TMN.	10
Q.6	<p>A network administrator needs to monitor his network for security and fault management. Explain how he can do this with the aid of specialized tools.</p> <p style="text-align: center;">OR</p> <p>Explain policy management architecture with the help of diagram. Which tools are used for policy management?</p>	10

K. J. Somaiya College of Engineering, Mumbai-77
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End Semester Exam
November – December 2017

Max. Marks: 100

Class: F.Y. M.Tech

Name of the Course: Emerging Databases

Branch: Computer Engg

Course Code: 1PCEC104

Duration: 3 hrs

Semester: I

Instructions:

- (1) All Questions are Compulsory
- (2) Draw neat diagrams
- (3) Assume suitable data if necessary

Question No.		Max. Marks																																																																											
Q 1 (a)	Discuss the guidelines for physical database design with suitable examples.	10																																																																											
Q 1 (b)	With example discuss how do we tune indexes, conceptual schema, queries and view	10																																																																											
Q2 (a)	Explain how TP-monitors can be used in complex transaction processing involving multiple clients and multiple servers.	10																																																																											
Q2 (b)	Discuss implementation of transaction management in a real time system. Compare high performance system and real time system <div style="text-align: center;">OR</div> <div style="text-align: right;">P.T.O</div>	10																																																																											
Q3 (a)	An hospital has collected following historical data for the classification of its patients has to whether they suffer from heart disease or not("Heart" is the decision attribute). Apply any classification algorithm and classify the following test data ($<60, <120, >200, \text{Male}, ?$) <table border="1"><thead><tr><th>Age</th><th>Trestbps</th><th>Chol</th><th>Gender</th><th>Heart</th></tr></thead><tbody><tr><td><50</td><td><120</td><td><200</td><td>Male</td><td>No</td></tr><tr><td><50</td><td><120</td><td><200</td><td>Female</td><td>No</td></tr><tr><td><70</td><td><120</td><td><200</td><td>Male</td><td>Yes</td></tr><tr><td><60</td><td><140</td><td><200</td><td>Male</td><td>Yes</td></tr><tr><td><60</td><td><160</td><td>>200</td><td>Male</td><td>Yes</td></tr><tr><td><60</td><td><160</td><td>>200</td><td>Female</td><td>No</td></tr><tr><td><70</td><td><160</td><td>>200</td><td>Female</td><td>Yes</td></tr><tr><td><50</td><td><140</td><td><200</td><td>Male</td><td>No</td></tr><tr><td><50</td><td><160</td><td>>200</td><td>Male</td><td>Yes</td></tr><tr><td><60</td><td><140</td><td>>200</td><td>Male</td><td>Yes</td></tr><tr><td><50</td><td><140</td><td>>200</td><td>Female</td><td>Yes</td></tr><tr><td><70</td><td><140</td><td><200</td><td>Female</td><td>Yes</td></tr><tr><td><70</td><td><120</td><td>>200</td><td>Male</td><td>Yes</td></tr><tr><td><60</td><td><140</td><td><200</td><td>Female</td><td>No</td></tr></tbody></table>	Age	Trestbps	Chol	Gender	Heart	<50	<120	<200	Male	No	<50	<120	<200	Female	No	<70	<120	<200	Male	Yes	<60	<140	<200	Male	Yes	<60	<160	>200	Male	Yes	<60	<160	>200	Female	No	<70	<160	>200	Female	Yes	<50	<140	<200	Male	No	<50	<160	>200	Male	Yes	<60	<140	>200	Male	Yes	<50	<140	>200	Female	Yes	<70	<140	<200	Female	Yes	<70	<120	>200	Male	Yes	<60	<140	<200	Female	No	10
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	<p style="text-align: center;">OR</p> <p>An university database contains information about the professors and courses they teach. The university has decided to publish this information on the web. Create a DTD and well-formed XML document that conforms to the DTD.</p>	
Q3 (b)	<p>What are the different phases of Knowledge discovery from databases? Describe the complete application scenario in which new knowledge may be mined from an existing database of transactions.</p>	10
Q4 (a)	<p>Illustrate with example how active rules are designed and implemented.</p>	10
Q4 (b)	<p>Describe deductive databases.</p> <p style="text-align: center;">OR</p> <p>Compare spatial and regular database. What is the different type of spatial data. Discuss different kinds of spatial queries.</p>	10
Q5 (a)	<p>Discuss the data management issues in mobile databases.</p> <p style="text-align: center;">OR</p> <p>What is Big data? Discuss the 4 v's of Big data with suitable example</p>	10
Q5 (b)	<p>Discuss any two recent storage systems in cloud.</p>	10
Q2 (b)	<p>Discuss how transaction management are handled effectively for long duration transaction</p>	10

Max. Marks: 100

End Semester Exam

Duration: 3 hours

Class: M.Tech

Name of the Course: Advanced Algorithms and Complexity

Semester: I

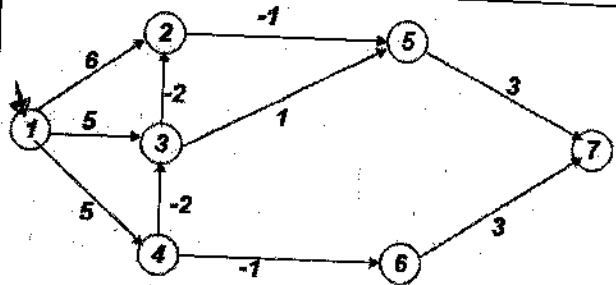
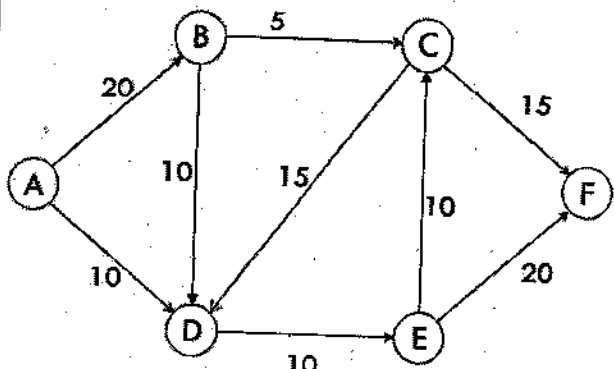
Course Code: IPCEC101

Branch: Computer Engineering

Instructions:

- (1) All Questions are Compulsory.
- (2) Figures to the right indicate full marks.
- (3) Assume suitable data, if necessary.

Question No.		Max. Marks																																				
Q1(a)	Define θ , O , Ω notations for algorithm complexity. Find the complexity of following recurrence using Substitution method $T(n)=2T(n-1)+1$	10																																				
Q1(b)	Explain Master's Method for solving recurrences. Solve the given recurrences using Master Theorem- a. $T(n) = 16T(n/4) + n^2$ b. $T(n) = T(2n/3) + 1$	10																																				
Q.2(a)	Explain Dynamic programming approach to solve knapsack problem. Solve the following Knapsack Problem Let $n=4$, $W_i=\{3, 4, 5, 6\}$, $P_i=\{50, 40, 10, 30\}$, Knapsack size $M=10$ OR Find the optimal solution for matrix chain multiplication with dimension sequence : $\langle 15, 8, 10, 12, 3 \rangle$ $A[15][8], B[8][10], C[10][12], D[12][3]$	10																																				
Q.2(b)	Write Quick Sort Algorithm and derive the best case and worst case complexity of it. OR Write an algorithm for Merge Sort. Derive the complexity of Merge sort.	10																																				
Q.3(a)	Find all pairs shortest path for the given weight matrix using Floyd- Warshall's Algorithm <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td>E</td> </tr> <tr> <td>A</td> <td>0</td> <td>5</td> <td>8</td> <td>∞</td> <td>-3</td> </tr> <tr> <td>B</td> <td>∞</td> <td>0</td> <td>∞</td> <td>2</td> <td>6</td> </tr> <tr> <td>C</td> <td>2</td> <td>∞</td> <td>0</td> <td>∞</td> <td>∞</td> </tr> <tr> <td>D</td> <td>2</td> <td>∞</td> <td>-4</td> <td>0</td> <td>∞</td> </tr> <tr> <td>E</td> <td>∞</td> <td>∞</td> <td>∞</td> <td>3</td> <td>0</td> </tr> </table> OR Consider following graph to compute shortest path from 1 to 7 using Bellman-ford Algorithm.		A	B	C	D	E	A	0	5	8	∞	-3	B	∞	0	∞	2	6	C	2	∞	0	∞	∞	D	2	∞	-4	0	∞	E	∞	∞	∞	3	0	10
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E	∞	∞	∞	3	0																																	

	<div><p>Source = 1</p></div>																										
(b)	<div><p>Evaluate the maximum flow from Node A to F for the given graph using Ford Flukerson Algorithm.</p></div>	10																									
Q.4 (a)	<div><p>Find the optimal solution for the given weight matrix using travelling sales person</p><table border="1" data-bbox="490 993 859 1194"><thead><tr><th></th><th>A</th><th>B</th><th>C</th><th>D</th></tr></thead><tbody><tr><th>A</th><td>∞</td><td>11</td><td>6</td><td>7</td></tr><tr><th>B</th><td>11</td><td>∞</td><td>12</td><td>6</td></tr><tr><th>C</th><td>4</td><td>8</td><td>∞</td><td>10</td></tr><tr><th>D</th><td>11</td><td>3</td><td>1</td><td>∞</td></tr></tbody></table><p>(dynamic programming method)</p></div>		A	B	C	D	A	∞	11	6	7	B	11	∞	12	6	C	4	8	∞	10	D	11	3	1	∞	10
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D	11	3	1	∞																							
(b)	<div><p>Differentiate between Greedy algorithm and dynamic Programming approach.</p><p>OR</p><p>Write the control abstraction (General Algorithm) for</p><ol style="list-style-type: none">Greedy Algorithm ApproachDivide and Conquer Approach</div>	10																									
Q.5 (a)	<div><p>Develop an Approximation Algorithm for Vertex Cover Problem. Explain with an example.</p><p>OR</p><p>What are complexity classes of problems? Explain with an example the differences between NP, NP-Complete and NP-Hard?</p></div>	10																									
Q.5 (b)	<div><p>Solve the Following linear programming using simplex method</p><p>Maximize $-5x_1 - 3x_2$</p><p>Subject to $x_1 - x_2 \leq 1$</p><p>$2x_1 + x_2 \leq 2$</p><p>Where $x_1, x_2 \geq 0$</p></div>	10																									

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End Semester Exam
Nov – Dec 2017

Max. Marks: 100

Class: MTech

Name of the Course: Advanced Digital Image Processing

Course Code: 1PCEC103

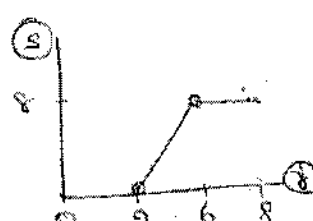
Duration: 3 Hrs

Semester: I

Branch: Computer

Instructions:

- (1) All Questions are Compulsory
- (2) Draw neat diagrams
- (3) Assume suitable data if necessary

Question No.		Max. Marks																
Q1	<p>Justify/Contradict the following statements with the help of example:</p> <p>i) Bit plane slicing is used in image steganography?</p> <p>ii) Show that the first difference of chain code normalizes to rotation.</p> <p>iii) All edge detection filters are called as high pass filters?</p> <p>iv) Spatial and intensity resolution of images is affected by changing the sampling and quantization rate?</p>	20																
Q2 (a)	<p>Given $F =$</p> <table><tr><td>2</td><td>5</td><td>3</td><td>5</td></tr><tr><td>3</td><td>6</td><td>5</td><td>3</td></tr><tr><td>3</td><td>5</td><td>2</td><td>4</td></tr><tr><td>2</td><td>5</td><td>4</td><td>5</td></tr></table>  <p>i) If the gray level intensity changes are to be made as shown in figure above, derive the necessary expression for obtaining the new pixel value using slope.</p> <p>ii) Obtain the new image by applying the above mentioned transformation function.</p> <p>iii) Plot and compare the histogram of input and output image.</p>	2	5	3	5	3	6	5	3	3	5	2	4	2	5	4	5	10
2	5	3	5															
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Q2 (b)	<p>How Signature and Fourier descriptors are used to represent an image?</p> <p style="text-align: center;">OR</p> <p>Find the corners of an object using hit miss transform, given below 10×10 image & four structuring elements.</p>	10																

	<table> <tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> </table> <table> <tr><td></td><td>1</td><td></td></tr> <tr><td>0</td><td>1</td><td>1</td></tr> <tr><td>0</td><td>0</td><td></td></tr> </table> <table> <tr><td></td><td>1</td><td></td></tr> <tr><td>1</td><td>1</td><td>0</td></tr> <tr><td></td><td>0</td><td>0</td></tr> </table> <table> <tr><td></td><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td><td>0</td></tr> <tr><td></td><td>1</td><td></td></tr> </table> <table> <tr><td>0</td><td>0</td><td></td></tr> <tr><td>0</td><td>1</td><td>1</td></tr> <tr><td></td><td>1</td><td></td></tr> </table> <div> <div>B1</div> <div>B2</div> <div>B3</div> <div>B4</div> </div> <p>In structuring elements, 1 represents foreground, 0 represents background and blank represents don't care.</p>	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		1		0	1	1	0	0			1		1	1	0		0	0		0	0	1	1	0		1		0	0		0	1	1		1		
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Q3 (a)	Show that how Hough transforms can be used to link edges.	10																																																																																																																																								
Q3 (b)	<p>What are Pseudo inverse filters and how are they different from inverse filters.</p> <p style="text-align: center;">OR</p> <p>What is image restoration? Compare image restoration with image enhancement.</p>	10																																																																																																																																								
Q4 (a)	Explain Two dimensional discrete wavelet transform decomposition and reconstruction.	10																																																																																																																																								
Q4 (b)	<p>Explain any one application of image processing</p> <p>i) Content based image retrieval</p> <p>ii) Vehicle number plate detection</p>	10																																																																																																																																								
Q.5	<p>Write short note on following: (Any Four)</p> <p>i) Color image quantization</p> <p>ii) Additive color model</p> <p>iii) Dilation & Erosion</p> <p>iv) Trimmed average filter</p> <p>v) Continuous wavelet transform</p> <p>vi) Image Negative</p>	20																																																																																																																																								

13.12.2017 (M)

K. J. Somaiya College of Engineering, Mumbai-77
(Autonomous College Affiliated to University of Mumbai)

End Semester Exam
Nov – Dec 2017

Max. Marks:100

Class: M.Tech.

Name of the Course: Cloud Computing and Virtualization

Branch: Computer

Course Code: 1PCEC102

Duration:3Hrs

Semester: I

Instructions:

- (1) All Questions are Compulsory
- (2) Draw neat diagrams
- (3) Assume suitable data if necessary

Question No.		Max. Marks
Q 1 (a)	What is VMDK File Structure? List different types of virtualization. Explain storage virtualization in detail.	10
Q 1 (b)	Write a short note on SUN virtual box. OR Write a short note on KVM Hypervisor.	10
Q2 (a)	What are the challenges and benefits of cloud computing? OR Discuss cloud computing and explain architecture of cloud computing with neat diagram.	10
Q2 (b)	Explain various issues in inter cloud environments.	10
Q3 (a)	Explain various QOS issues in cloud.	10
Q3 (b)	Explain disaster recovery in cloud computing environment. OR Write a short note on Vulnerability assessment for cloud	10
Q4 (a)	Explain Eucalyptus architecture and its various components and neat diagram.	10
Q4 (b)	Write short note on: i. Differentiate between Vertical Scaling and Horizontal scaling ii. Community cloud	10
Q5 (a)	Explain security issues and challenges specific to virtual machines. OR Write down step by step procedure to deploy HTML page on cloud with Google App Engine?	10
Q5 (b)	What is mobile cloud computing? Explain its architecture with neat diagram.	10

