SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)
(Accredited by NBA-AICTE, New Delhi, Accredited by NAAC with "A" Grade)
Madagadipet, Puducherry - 605 107

M. TECH END SEMESTER EXAMINATIONS, FEBRUARY 2023
I SEMESTER
COMPUTER SCIENCE AND ENGINEERING
MATHEMATICAL FOUNDATION OF FORMAL APPROACH (P20BST103)

Duration: 3 hrs. **Max. Marks- 60**

Note: B.L – Bloom's Level CO- Course Outcome

Q. No		Marks	B.L	CO's
	PART A (12 Marks) **Answer all the Questions (6x2=12)**			
Q.1	Find the Eigen values of $\begin{bmatrix} a & h & g \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$.	2	3	CO 1
Q.2	Find the rank of a matrix $A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 6 & 8 \\ -1 & -2 & -3 & -4 \end{bmatrix}$.	2	3	CO 1
Q.3	Define Binary relation with an example.	2	1	CO 2
Q.4	Construct the Truth table for $p \wedge \sim p$.	2	2	CO 3
Q.5	Define the Conditional statement $p \rightarrow q$.	2	1	CO 3
Q.6	Write the Chomsky classification of grammar in formal languages.	2	1	CO 4
	PART B (48 Marks) **Answer any four question (4x12=48)**			
Q.7	Verify the Cayley-Hamilton theorem for $A = \begin{pmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{pmatrix}$. Also find A^{-1} and A^4.	12	4	CO 1
Q.8	Find the Eigen value and Eigen vector of $A = \begin{pmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{pmatrix}$.	12	3	CO 1
Q.9	If A, B and C are non-empty sets. Show that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ using Venn diagram.	12	3	CO 2
Q.10	Prove that $(\exists x)\big(P(x) \wedge Q(x)\big) \Rightarrow (\exists x)\, P(x) \wedge (\exists x)\, Q(x)$.	12	5	CO 3
Q.11	Without constructing the Truth table, obtain the product of sums canonical form of the form $(\neg P \rightarrow R) \wedge (Q \leftrightarrow P)$. Hence find the sums of Product canonical form.	12	3	CO 3
Q.12	Derive the Context free languages.	12	5	CO 4

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M. TECH END SEMESTER EXAMINATIONS, FEBRUARY 2023
I SEMESTER
COMPUTER SCIENCE AND ENGINEERING
ADVANCED DATA STRUCTURES AND ALGORITHMS (P20CST101)

Duration: 3 hrs. **Max. Marks- 60**

Note: B.L – Bloom's Level CO- Course Outcome

Q. No		Marks	B.L	CO's
	PART A (12 Marks) **Answer all the Questions (6x2=12)**			
Q.1	Define the need for Balanced binary search trees	2	2	CO1
Q.2	List the nature of insertions in a two level Priority queue	2	2	CO2
Q.3	List methods of rotations done to achieve height balancing	2	2	CO2
Q.4	Define the need for prefix trees with a suitable example	2	2	CO3
Q.5	List characteristics of set data type and how is it implemented	2	2	CO3
Q.6	Define the term Spanning tree and its uses	2	2	CO4
	PART B (48 Marks) **Answer any four question (4x12=48)**			
Q.7	Discuss the storage of sparse matrices and its advantages	12	2	CO1
Q.8	Discuss the role of recurrence equations in present day computing with any two suitable examples	12	2	CO1
Q.9	Discuss the Method of Heap sort and provide intermediate answers for sorting in descending order, the following integer values 15, 25, 20, 45, 06, 13, 35, 57, 32, 59, 71	12	3	CO2
Q.10	Discuss the advantages and disadvantages of Greedy Method in a detailed manner with a suitable example.	12	3	CO3
Q.11	Discuss the role of Huffman coding with the given probabilistic values. .001, .003, .009, .083, .040, .105, .249, .25, .26,	12	4	CO3
Q.12	Explain the role of Dynamic Programming principles in Travelling Salesperson Problem with a suitable numerical example	12	3	CO4

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M. TECH END SEMESTER EXAMINATIONS, FEBRUARY – 2023

I SEMESTER

COMPUTER SCIENCE AND ENGINEERING

CLOUD AND BIG DATA ANALYTICS (P20CST102)

Duration: 3 hrs. **Max. Marks-75**

Note: B.L – Bloom's Level CO- Course Outcome

Q. No		Marks	B.L	CO's
	PART A (12 Marks) **Answer all the Questions (6x2=12)**			
Q.1	Write the difference between cloud computing and grid computing	2	1	1
Q.2	What is meant by Business Process Execution Language?	2	2	2
Q.3	Define VL2.	2	1	3
Q.4	List the challenges in big data analytics	2	4	4
Q.5	Write the benefits of Blade Servers.	2	2	2
Q.6	What is active monitoring and passive monitoring in cloud service operation?	2	1	2
	PART B (48 Marks) **Answer any four question (4x12=48)**			
Q.7	Explain in detail about Server Virtualization and also Discuss about the comparison of Parallel Processing and Vector Processing.	12	2	1
Q.8	Write short notes on Network Virtualization in Multi-Tenant Data Centers VL2.Write the merits and demerits of VL2 with NVP	12	2	2
Q.9	Define Software Defined Network (SDN). Write the comparison between Traditional Networking versus Software Defined Networking. Describe the opportunities and challenges in SDN.	12	1	3
Q.10	What are the various operational modes of hadoop cluster configuration and explain in detail about configuring/installing hadoop in fully distributed mode.	12	1	4
Q.11	How Hadoop streaming is suited with text processing? Explain in detail manner.	12	4	4
Q.12	Discuss about data center challenges and solutions with real time examples.	12	5	2

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M. TECH END SEMESTER EXAMINATIONS, FEBRUARY 2023
I SEMESTER
COMMON TO ALL
RESEARCH METHODOLOGY AND IPR (P20CCT101)

Duration: 3 hrs. **Max. Marks- 60**

Note: B.L – Bloom's Level CO- Course Outcome

Q. No		Marks	B. L	CO's
	PART A (12 Marks) **Answer all the Questions (6x2=12)**			
Q.1	List out various types of research in detail with example.	2	1	CO1
Q.2	Identify the need for presentation and assessment by a review committee for research paper.	2	2	CO2
Q.3	Define literature review and identify its importance while starting a research work.	2	3	CO2
Q.4	Highlight the importance of research proposal for getting funds from organizations.	2	4	CO3
Q.5	Define Plagiarism and list any two software used by researchers for checking plagiarism.	2	2	CO4
Q.6	List out the need for h – Index in research profile for individual researcher.	2	1	CO4
	PART B (48 Marks) **Answer any four question (4x12=48)**			
Q.7	List and elaborate various methods of collecting primary data for research project.	12	1	CO1
Q.8	Give a detailed account on various approaches adopted by researchers in solving problems stated by them.	12	1	CO1
Q.9	Discuss the significance of critical literature reviews and their applications in the planning of innovation research.	12	3	CO2
Q.10	Write short notes on the following: (a) Innovation (b) International cooperation on Intellectual Property (c) Trade and Copyright	12	2	CO3
Q.11	What is ethics? What are the various ethics to be followed in research work?	12	2	CO2
Q.12	Explain in detail about Intellectual Property Rights and identify the requirements or precautions to be taken for obtaining good trade mark.	12	4	CO5

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M. TECH END SEMESTER EXAMINATIONS, APRIL-MAY 2022
I SEMESTER
COMPUTER SCIENCE AND ENGINEERING
MATHEMATICAL FOUNDATION OF FORMAL APPROACH (P20BST103)

Duration: 3 hrs. **Max. Marks- 60**

Note: B.L – Bloom's Level CO- Course Outcome

		Marks	B.L	CO's
	PART A (12 Marks) **Answer all the Questions (6x2=12)**			
Q.1	Find the sum and product of the eigen values of the matrix $\begin{bmatrix} 3 & 1 & 4 \\ 0 & 2 & 6 \\ 0 & 0 & 5 \end{bmatrix}$.	2	2	CO1
Q.2	Find the Characteristic Equation of $\begin{bmatrix} 1 & -2 \\ -5 & 4 \end{bmatrix}$	2	2	CO1
Q.3	For the given sets A = {- 10,0,1, 9, 2, 4, 5} and B = {- 1,- 2, 5, 6, 2,3,4},find $\mathbf{A \cup B}$ and $\mathbf{B \cup A}$	2	2	CO2
Q.4	Define De Morgan's Laws for complementation.	2	2	CO2
Q.5	Construct the truth table for $(P \wedge Q) \wedge \neg(P \vee Q)$	2	2	CO3
Q.6	Write the Chomsky Classification of Grammar in formal languages.	2	2	CO4
	PART B (48 Marks) **Answer any four question (4x12=48)**			
Q.7	Find the eigen values and eigen vectors of the matrix $A = \begin{pmatrix} 2 & 2 & 0 \\ 2 & 1 & 1 \\ -7 & 2 & -3 \end{pmatrix}$.	12	4	CO1
Q.8	Verify Cayley-Hamilton theorem for the matrix $A = \begin{pmatrix} 2 & -1 & 2 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{pmatrix}$ and also find A^4 and A^{-1}.	12	4	CO1
Q.9	If $\mathbf{A, B}$ and $\mathbf{C}$ are nonempty sets, with the help of Venn diagram, show that $\mathbf{A \cap (B \cup C) = (A \cap B) \cup (A \cap C)}$	12	3	CO2
Q.10	In a group of students, 65 play football, 45 play hockey, 42 play cricket, 20 play football and hockey, 25 play football and cricket, 15 play hockey and cricket and 8 play all the three games. Find the number of students in the group.	12	3	CO2
Q.11	Construct the truth table for (i) $\neg(P \vee Q) \wedge (P \vee R)$ (ii) $\neg(P \rightarrow Q) \rightarrow \neg Q$	12	4	CO3
Q.12	Derive the Pumping Lemma for Regular Languages.	12	4	CO4

25/4/22

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M. TECH END SEMESTER EXAMINATIONS, APRIL-MAY 2022
I SEMESTER
COMPUTER SCIENCE AND ENGINEERING
MATHEMATICAL FOUNDATION OF FORMAL APPROACH (P20BST103)

Duration: 3 hrs. **Max. Marks- 60**

Note: B.L – Bloom's Level CO- Course Outcome

		Marks	B.L	CO's
	PART A (12 Marks) **Answer all the Questions (6x2=12)**			
Q.1	Find the sum and product of the eigen values of the matrix $\begin{bmatrix} 3 & 1 & 4 \\ 0 & 2 & 6 \\ 0 & 0 & 5 \end{bmatrix}$.	2	2	CO1
Q.2	Find the Characteristic Equation of $\begin{bmatrix} 1 & -2 \\ -5 & 4 \end{bmatrix}$	2	2	CO1
Q.3	For the given sets A = {- 10,0,1, 9, 2, 4, 5} and B = {- 1,- 2, 5, 6, 2,3,4},find $\mathbf{A \cup B}$ and $\mathbf{B \cup A}$	2	2	CO2
Q.4	Define De Morgan's Laws for complementation.	2	2	CO2
Q.5	Construct the truth table for $(P \wedge Q) \wedge \neg(P \vee Q)$	2	2	CO3
Q.6	Write the Chomsky Classification of Grammar in formal languages.	2	2	CO4
	PART B (48 Marks) **Answer any four question (4x12=48)**			
Q.7	Find the eigen values and eigen vectors of the matrix $A = \begin{pmatrix} \mathbf{2} & \mathbf{2} & \mathbf{0} \\ \mathbf{2} & \mathbf{1} & \mathbf{1} \\ \mathbf{-7} & \mathbf{2} & \mathbf{-3} \end{pmatrix}$.	12	4	CO1
Q.8	Verify Cayley-Hamilton theorem for the matrix $A = \begin{pmatrix} \mathbf{2} & \mathbf{-1} & \mathbf{2} \\ \mathbf{-1} & \mathbf{2} & \mathbf{-1} \\ \mathbf{1} & \mathbf{-1} & \mathbf{2} \end{pmatrix}$ and also find A^4 and A^{-1}.	12	4	CO1
Q.9	If $\mathbf{A, B}$ and $\mathbf{C}$ are nonempty sets, with the help of Venn diagram, show that $\mathbf{A \cap (B \cup C) = (A \cap B) \cup (A \cap C)}$	12	3	CO2
Q.10	In a group of students, 65 play football, 45 play hockey, 42 play cricket, 20 play football and hockey, 25 play football and cricket, 15 play hockey and cricket and 8 play all the three games. Find the number of students in the group.	12	3	CO2
Q.11	Construct the truth table for (i) $\neg(P \vee Q) \wedge (P \vee R)$ (ii) $\neg(P \rightarrow Q) \rightarrow \neg Q$	12	4	CO3
Q.12	Derive the Pumping Lemma for Regular Languages.	12	4	CO4

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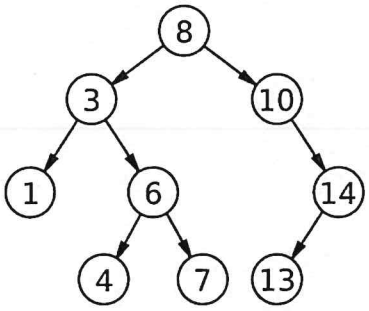
M. TECH END SEMESTER EXAMINATIONS, APRIL-MAY 2022
1 SEMESTER
COMPUTER SCIENCE AND ENGINEERING
ADVANCED DATA STRUCTURES AND ALGORITHMS (P20CST101)

Duration: 3 hrs. **Max. Marks- 60**

Note: B.L – Bloom's Level CO- Course Outcome

		Marks	B.L	CO's
	PART A (12 Marks) **Answer all the Questions**			
Q.1	State Mathematical induction.	2	1	CO1
Q.2	Predict the result of inserting 3,1,4,6,9,2,5,7 into an initially empty binary search tree.	2	2	CO2
Q.3	Extend at what conditions AVL tree balancing is to be done.	2	2	CO2
Q.4	Label the pattern matching for Brute force.	2	1	CO3
Q.5	Define Minimum spanning tree.	2	1	CO4
Q.6	Outline the properties of Multithreaded algorithms.	2	1	CO4
	PART B (48 Marks) **Answer any Four Questions**			
Q.7	Illustrate with suitable examples of NP hard and NP Completeness.	12	3	CO1
Q.8	Analyze Red Black trees in detail with suitable examples.	12	4	CO2
Q.9	Categorize Binary search tree deletion and delete 8 in the below BST. 	12	4	CO2
Q.10	Interpret the Longest common subsequence problem with an example.	12	3	CO3
Q.11	Demonstrate Multithreaded algorithms in detail with an example.	12	3	CO4
Q.12	Prioritize the usages of Elementary graph algorithms with suitable examples.	12	4	CO4

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M. TECH END SEMESTER EXAMINATIONS, APRIL-MAY 2022
1 SEMESTER
COMPUTER SCIENCE AND ENGINEERING
CLOUD AND BIGDATA ANALYTICS (P20CST102)

Duration: 3 hrs. **Max. Marks- 60**

Note: B.L – Bloom's Level CO- Course Outcome

		Marks	B.L	CO's
	PART A (12 Marks) **Answer all the Questions (6x2=12)**			
Q.1	How would you solve to establish a Common Protocol for the Internet?	2	3	CO1
Q.2	Define Hyperthreading	2	1	CO2
Q.3	Define Mininet and its applications	2	1	CO3
Q.4	What is Big Data and mention its applications	2	2	CO4
Q.5	Define Symmetric Multiprocessing Systems.	2	1	CO1
Q.6	What is WSDL and SOAP?	2	2	CO2
	PART B (48 Marks) **Answer any four Questions (4x12=48)**			
Q.7	a) Explain characteristics, benefits of Software-as-a-Service, along with its maturity levels.	6	2	CO1
	b) How can you efficiently manage the data in cloud?	6	1	
Q.8	Discuss about Universal Description, Discovery, and Integration (UDDI) and Business Process Execution Language (BPEL).	12	6	CO2
Q.9	Explain Docker, and Linux containers methods of virtualization.	12	5	CO3
Q.10	Illustrate with a neat sketch Apache Hadoop and its eco system.	12	2	CO4
Q.11	Classify the different types of virtualizations.	12	4	CO2
Q.12	a) What are the contents of Big Insights?	6	4	CO4
	b) How would you apply processing scenarios in Big Sheets.	6	3	

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M. TECH END SEMESTER EXAMINATIONS, APRIL-MAY 2022

I SEMESTER

COMPUTER SCIENCE AND ENGINEERING

CRYPTOGRAPHY AND INFORMATION SECURITY (P20CSE105)

Duration: 3 hrs. **Max. Marks- 60**

Note: B.L – Bloom's Level CO- Course Outcome

		Marks	B.L	CO's
	PART A (12 Marks) **Answer all the Questions (6x2=12)**			
Q.1	What is the purpose of the S-boxes in DES?	2	3	CO1
Q.2	Perform encryption and decryption using RSA Algorithm. for the following. P=7; q=11; e=17; M=8.	2	4	CO1
Q.3	Define Pseudo Random Numbers.	2	2	CO2
Q.4	What are the functions of Digital Signatures?	2	2	CO3
Q.5	Differentiate between threats and attacks?	2	3	CO4
Q.6	Why the leading two octets of message digest are stored in PGP message along with encrypted message digest?	2	4	CO4
	PART B (48 Marks) **Answer any four question (4x12=48)**			
Q.7	User A and B exchange the key using Diffie-Hellman algorithm. Assume α=5 q=11 XA=2 XB=3. Find the value of YA, YB and k.	12	4	CO1
Q.8	Explain in detail about DES and Triple DES.	12	2	CO1
Q.9	Compare stream cipher and block cipher with example.	12	3	CO2
Q.10	(i)Write and explain the digital signature algorithm. (8) (ii) Explain Hash Functions. (4)	12	2	CO3
Q.11	Describe the familiar types of firewall configurations.	12	2	CO4
Q.12	What is Kerberos? Explain how it provides authenticated service.	12	2	CO3