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II/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION**April, 2018****Fourth Semester****Time:** Three Hours**Common to all branches****Engineering Mathematics - IV****Maximum : 60 Marks***Answer Question No.1 compulsorily.*

(1X12 = 12 Marks)

Answer ONE question from each unit.

(4X12=48 Marks)

1 Answer all questions

(1X12=12 Marks)

- Find general value of $\log(-i)$.
- If $x + iy = \sqrt{2}$, find $x^2 + y$.
- Write C-R equations in polar coordinates.
- State Cauchy's integral theorem.
- Expand $\frac{1}{z-2}$ in $|z| < 1$ as Taylor's series.
- Find the poles of $\frac{(z-1)^2}{z(z-3)^2}$ which lie in $|z| < 2$.
- Write the properties of normal distribution curve.
- State central limit theorem.
- Verify that whether the function $f(x) = \begin{cases} 4x - 2x^2 - 1 & 0 \leq x \leq 2 \\ 0 & \text{otherwise} \end{cases}$ is probability density function?
- Define level of significance.
- Write the test statistic for one proportion.
- State different types of errors.

UNIT I

- Find all roots of the equation $\sqrt[4]{1+i}$. 6M
 - Evaluate $\int_C \frac{e^{z^2}}{(z-i)^4} dz$, where C is $|z| = 2$ using Cauchy's integral formula. 6M

(OR)

- Construct the analytic function whose real part is $e^x [(x^2 - y^2) \cos y - 2xy \sin y]$. 6M
 - Evaluate (i) $\int_C \frac{\sin \pi z^2 + \cos \pi z^2}{(z-1)(z-2)} dz$ where C is the circle $|z| = 3$ 4M
(ii) $\int_C \frac{z^2 - z + 1}{z-1} dz$, where C is the circle $|z| = \frac{1}{2}$ 2M

UNIT II

- Expand $f(z) = \frac{1}{z^2(z-1)}$ as Laurent series in the regions $0 < |z-1| < 1$ and $|z-1| > 1$. 6M
 - Compute $\int_C \frac{1}{z(z+1)^2(z+3)} dz$, where C is $|z| = 2$ using Cauchy's residue theorem. 6M

(OR)

- Evaluate $\int_{-\infty}^{\infty} \frac{x^2}{(x^2+1)(x^2+4)} dx$ by method of contour integration. 6M
 - Find the nature and location of singularities of the following functions
(i) $\frac{z - \sin z}{z}$ (ii) $(z+1) \sin\left(\frac{1}{z-2}\right)$ (iii) $\frac{1}{\cos z - \sin z}$ 6M

UNIT III

- 6 a) The length of satisfactory service (years) provided by certain model of laptop computer is a random variable having the probability density $f(x) = \begin{cases} \frac{1}{4.5} e^{-x/4.5}, & \text{for } x > 0 \\ 0 & ; x \leq 0 \end{cases}$. Find the probability that one of the laptops will provide satisfactory service for (i) at most 2.5 years (ii) anywhere from 4 to 6 years (iii) at least 6.75 years. 6M
- b) The guaranteed average life of a certain type of electric bulbs is 1500hrs with a S.D of 120 hrs. It is decided to sample the output so as to ensure that 95% of bulbs do not fall short of the guaranteed average by more than 2%. What will be the minimum sample size? 6M

(OR)

- 7 a) If 20% of the memory chips made in a certain plant are defective, what are the probabilities that in a lot of 100 randomly chosen for inspection (a) at most 15 will be defective? (b) exactly 15 will be defective? 6M
- b) If two random variables have the joint density $f(x_1, x_2) = \begin{cases} x_1 x_2; & \text{for } 0 < x_1 < 2, 0 < x_2 < 1 \\ 0 & ; \text{elsewhere} \end{cases}$. Find the probability that (a) Both random variables will take on values less than 1. (b) The sum of the values taken on by the two random variables will be less than 1. 6M

UNIT IV

- 8 a) The specifications for a certain kind of ribbon call for a mean breaking strength of 180 pounds. If five pieces of the ribbon (randomly selected from different rolls) have a mean breaking strength of 169.5 pounds with a SD of 5.7 pounds, test the null hypothesis $\mu = 180$ pounds against the alternative hypothesis $\mu < 180$ pounds at the 0.01 level of significance. Assume that the population distribution is normal. 6M
- b) It is desired to determine the whether there is less variability in the silver plating done by company-1 than in that done by company-2. If independent random samples of size 12 of the two companies' work yield $s_1 = 0.035$ mil and $s_2 = 0.062$ mil, test the null hypothesis $\sigma_1^2 = \sigma_2^2$ against the alternative hypothesis $\sigma_1^2 < \sigma_2^2$ at the 0.05 level of significance. 6M

(OR)

- 9 a) The mean and SD of a population are 11,795 and 14,054 respectively. If $n = 50$, find 95% confidence interval for the mean. 6M
- b) In a random sample of 400 industrial accidents, it was found that 231 were due at least partially to unsafe working conditions. Construct a 99% confidence interval for the corresponding true proportion using the large sample confidence interval formula 6M

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II/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION

April, 2018

Fourth Semester

Time: Three Hours

Information Technology

Automata Theory & Formal Technology

Maximum : 60 Marks

Answer Question No.1 compulsorily.

(1X12 = 12 Marks)

Answer ONE question from each unit.

(4X12=48 Marks)

1. Answer all questions

(1X12=12 Marks)

- Define alphabet, string and language
- Differentiate DFA and NFA
- Is $(r^*)^* = r^*$?
- State any two algebraic laws of regular expressions.
- Define ϵ -closure of a state.
- Define PDA.
- What is meant by regular Grammar?
- What is Context Free Grammar?
- Give Chomsky Hierarchy.
- What is the difference between $+$ and $*$ in regular expressions ?.
- What is instantaneous description of a TM ?.
- What are recursive languages?.

UNIT I

- Construct a DFA that accept all the strings such that the sum of the digits is divisible by 3.
- Consider the following ϵ -NFA . Find its equivalent NFA.

6 M

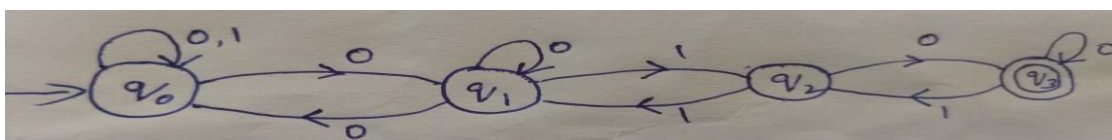
6 M

	ϵ	a	b	C
$\rightarrow p$	{ q,r}	Φ	{q}	{r}
q	Φ	{p}	{r}	{p,q}
$*r$	Φ	Φ	Φ	Φ

(OR)

- Construct a DFA such that, $L(M) = \{ x/x \text{ is a string of } a's, b's \text{ such that } x \text{ contains a substring } aba \}$
- Construct equivalent DFA for the following NFA.

6 M



6 M

UNIT II

- State and prove pumping lemma for regular languages.
- Obtain the minimal DFA for the following transition table.

6 M

state	0	1
$\rightarrow a$	b	f
b	g	c
c	a	c
d	c	g
e	h	b
f	c	g
g	g	e
h	g	c

6 M

(OR)

- Construct finite automaton to accept the following regular expression $(0+1)^*(00+11)(0+1)^*$
- Discuss any two closure properties of regular set with an example.

6 M

6 M

UNIT III

6. a) Show that the grammar $E \rightarrow E + E$, $E \rightarrow E^*E$, $E \rightarrow (E)$, $E \rightarrow \text{id}$ is ambiguous. 6 M
 b) Construct a push down automatic accepting $\{ a^n b^m a^n \mid m, n \geq 1 \}$ 6 M
(OR)
7. a) Show that $L = \{ a^i b^j \mid j = i^2 \}$ is not context free language. 6 M
 b) Reduce the following grammar to GNF.
 $G = (\{ A_1, A_2, A_3 \}, \{ a, b \}, P, A_1)$ Where the productions are as follows;
 $A_1 \rightarrow A_2 A_3$, $A_2 \rightarrow A_3 A_1 / b$, $A_3 \rightarrow A_1 A_2 / a$ 6 M

UNIT IV

8. a) Does the PCP with two lists $x = (b, bab^3, ba)$ and $y = (b^3, ba, a)$ have a solution? 6 M
 b) Design a Turing machine to recognise the language that has a balance set of parenthesis, $()$. 6 M
(OR)
9. a) Write about decision properties for CFL. 6 M
 b) Write in detail about Universal Turing Machine with an example. 6 M

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II/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION**April, 2018****Fourth Semester****Time:** Three Hours**Common to CSE & IT****Computer Organization****Maximum:** 60 Marks*Answer Question No.1 compulsorily.*

(1X12 = 12 Marks)

Answer ONE question from each unit.

(4X12=48 Marks)

1. Answer all questions

(1X12=12 Marks)

- What is the use of buffers?
- Write basic performance equation.
- What is interrupt?
- How control memory works?
- What is the role of micro programmed Control?
- Explain indirect register addressing modes.
- State the meaning of locality of reference
- Define virtual Memory.
- How the cache memory helps to improve the performance of computer?
- What is the advantage of data transfer using DMA?
- What is the throughput of Pipeline processor?
- Define USB.

UNIT I

- Write about basic operational concepts of computer. 6M
 - Discuss about shift and rotate instructions with neat sketch. 6M

(OR)

- Demonstrate the direct and indirect addressing mode of basic computer taking a suitable example. 6M
 - Explain about performance considerations of computer. 6M

UNIT II

- Write about micro programmed control in detail. 6M
 - Show the step by step multiplication process using Booth algorithm. When the following binary numbers are multiplied. Assume 5-bit registers that holds signed numbers: (+15) X (+13). 6M

(OR)

- Explain the difference between hardwired control and micro programmed control. Is it possible to have a hardwired control associated with a control memory? 6M
 - Explain single and double precision format of a floating point number representation. 6M

UNIT III

- What are the attributes used in design of Memory hierarchy? Show the memory hierarchy organization. 8M
 - Contrast cache memory and virtual memory 4M

(OR)

- Show the four stages of pipeline and explain how it helps to improve the performance of computer 6M
 - What is Hazard? Explain about data Hazards in detail. 6M

UNIT IV

- In most computers an interrupt is recognized only after the execution of the instruction. Consider the possibility of acknowledging the interrupt at any time during the execution of the instruction. Discuss the difficulty that may arise. 6M
 - What is the difference between program controlled I/O transfer and DMA transfer? 6M

(OR)

- What is the need for DMA? Explain the working of DMA. Also mention its advantages. 8M
 - What are events generated by SCSI controller after receive command from processor. 6M

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II/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION**April, 2018****Common to CSE & IT****Fourth Semester****Design And Analysis of Algorithms****Time:** Three Hours**Maximum:** 60 Marks*Answer Question No.1 compulsorily.*

(1X12 = 12 Marks)

Answer ONE question from each unit.

(4X12=48 Marks)

(1X12=12 Marks)

1. Answer all questions
 - a) Write the syntax for 'for' and repeat –until' statements.
 - b) What is a recursive algorithm?
 - c) List various asymptotic notations.
 - d) Write the control abstraction procedure of Divide and Conquer.
 - e) What is the use of Dijkstra's algorithm?
 - f) Define safe edge.
 - g) Define explicit and implicit constraints in backtracking.
 - h) Define state space tree.
 - i) What is the purpose of 0/1 Knapsack problem?
 - j) Describe traveling salesman problem.
 - k) Write two applications of Branch and Bound
 - l) What is decision problem?

UNIT I

2. a) Explain four distinct areas of study of an algorithm. 5M
- b) Discuss about pseudo conventions. 7M

(OR)

3. a) Explain Strassen's matrix multiplication using Divide and conquer strategy and derive its time complexity. 8M
- b) Briefly explain the method of Quick Sort using Divide and conquer strategy. 4M

UNIT II

4. a) Write an algorithm for Knapsack problem. Find an optimal solution to the knapsack instance $n=3$, $m=20$, $(p_1, p_2, p_3) = (25, 24, 15)$ and $(w_1, w_2, w_3) = (18, 15, 10)$ using greedy method. 8M
- b) Differentiate between Greedy method and Dynamic Programming. 4M

(OR)

5. a) What is the purpose of multistage graph problem? Explain various approaches involved in it. 7M
- b) Write short notes on Traveling Salesperson problem. 5M

UNIT III

6. a) What are strongly-connected components? Give an algorithm to determine strongly-connected components of a given graph.. 7M
- b) Write the iterative backtracking algorithm and explain. 5M

(OR)

7. a) Solve the 0/1 knapsack problem with the given data using backtracking.
 $m=24$, $n=6$, $p=(10, 8, 8, 10, 10, 9)$ and $w=(5, 4, 3, 4, 6, 7)$ 9M
- b) Define the following
 i)problem state ii)answer state iii)solution state 3M

UNIT IV

8. a) What do you mean by bounding? Explain how these bound are useful in branch and bound methods 7M
- b) Differentiate between Backtracking and Branch and Bound. 5M

(OR)

9. a) Write short notes on Least Cost Search. 7M
- b) Differentiate between NP-complete and NP-Hard. 5M

Bapatla Engineering College

II/IV B.Tech DEGREE EXAMINATION

Department of Information Technology

Design And Analysis of Algorithms

Time : 3 Hours

Total Marks: 60

Answer Question No. 1 compulsorily

(12x1=12 Marks)

Answer ONE Question from each Unit

(4x12=48 Marks)

1. Answer all the Questions

12 x 1 =12M

- a. Write the syntax for 'for' and repeat –until' statements.
- b. What is a recursive algorithm?
- c. List various asymptotic notations.
- d. Write the control abstraction procedure of Divide and Conquer.
- e. What is the use of Dijkstra's algorithm?
- f. What is an articulation point?
- g. Define explicit and implicit constraints in backtracking.
- h. What is the difference between backtracking and branch and bound?
- i. What is the purpose of 0/1 Knapsack problem?
- j. Describe traveling salesman problem.
- k. Write two applications of Branch and Bound
- l. What is decision problem?

UNIT-1

2. a) Explain four distinct areas of study of an algorithm.
- b) Discuss about pseudo conventions.

5M

7M

(OR)

3. a) Explain Strassen's matrix multiplication using Divide and conquer strategy and derive its time complexity.
- b) Briefly explain the method of Quick Sort using Divide and conquer strategy.

8M

4M

UNIT-1I

4. a.) Write an algorithm for Knapsack problem. Find an optimal solution to the knapsack instance $n=3$, $m=20$, $(p_1, p_2, p_3) = (25, 24, 15)$ and $(w_1, w_2, w_3) = (18, 15, 10)$ using greedy method.
- b) Differentiate between Greedy method and Dynamic Programming.

8M

4M

(OR)

5. a) What is the purpose of multistage graph problem? Explain various approaches involved in it. **7M**
b) Write short notes on Traveling Salesperson problem. **5M**

UNIT-1II

6. a) What are bi-connected components ? Give an algorithm to determine bi-connected components of a given graph.. **7M**
b) Write the iterative backtracking algorithm and explain. **5M**

(OR)

7. a. Solve the 0/1 knapsack problem with the given data using backtracking.
m=24, n=6, p=(10,8,8,10,10,9) and w=(5,4,3,4,6,7) **9M**
b. Define the following **3M**
i) problem state ii) answer state iii) solution state

UNIT-1V

- 8.a.) What do you mean by bounding? Explain how these bound are useful in branch and bound methods **7M**
b) Differentiate between Backtracking and Branch and Bound. **5M**

(OR)

9. a) Write short notes on Least Cost Search. **7M**
b) Differentiate between NP-complete and NP-Hard. **6M**

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II/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION**April, 2018****Fourth Semester****Time:** Three Hours**Common for CSE & IT****GUI Programming****Maximum : 60 Marks***Answer Question No.1 compulsorily.**(1X12 = 12 Marks)**Answer ONE question from each unit.**(4X12=48 Marks)**(1X12=12 Marks)*

1. Answer all questions
 - a) Write the syntax to create an object of a class.
 - b) Write the uses of final keyword in java.
 - c) What is an abstract class?
 - d) What is an Exception?
 - e) Define the term Thread.
 - f) List any two collection classes of Java.
 - g) What is stream?
 - h) What is Applet? Write the syntax of <applet> tag.
 - i) What is Event?
 - j) What is Headless Exception?
 - k) Differentiate awt and swings.
 - l) List two constructors of JButton Class

UNIT I

2. a) Explain the following OOP principles in detail.
Encapsulation, Inheritance, Polymorphism 6M
- b) Explain Declaration, Initialization and access elements of Multidimensional Array with an example program. 6M

(OR)

3. a) Write a short note on Inheritance and types of Inheritance. 6M
- b) Explain the concept of Dynamic Method Dispatch with suitable example. 6M

UNIT II

4. a) Explain various string handling methods with suitable examples. 6M
- b) Explain StringBuffer Constructors and methods with an example. 6M

(OR)

5. a) Explain the concept of Interthread Communication in detail 6M
- b) Write a short on the concept of Thread priorities with suitable examples. 6M

UNIT III

6. a) Write a Java Program to copy contents of one file to another file using Character Streams. 6M
- b) Explain various Byte Streams in detail. 6M

(OR)

7. a) Explain the architecture of an Applet with its life cycle methods. 6M
- b) Explain various Event classes in detail. 6M

UNIT IV

8. a) Write a short note on creating a Swing Applet with suitable example. 6M
- b) Explain JTree class and create a list using suitable event handling functions in JTree. 6M

(OR)

9. a) Discuss various Layout Mangers to place the components in an Applet. 6M
- b) Explain Event handling using AWT components. 6M

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II/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION**April, 2018****Fourth Semester****Time:** Three Hours**Department of CSE & IT****Web Technologies****Maximum : 60 Marks***Answer Question No.1 compulsorily.*

(1X12 = 12 Marks)

Answer ONE question from each unit.

(4X12=48 Marks)

1. Answer all questions

(1X12=12 Marks)

- What is the purpose of img tag?
- Write the structure of html document.
- What is the Difference Between DHTML and HTML?
- Write about background-position property.
- How to declare an array in Java Script?
- What are the built-in functions in Java Script?
- What are rules for XML elements?
- Write the syntax of attributes in DTD.
- Difference between XML and Html.
- What are call-back functions in AJAX.
- What is the difference between id and class?
- What is DOM?

UNIT I

- What is the importance of lists in HTML? Explain different types lists used in HTML with suitable examples. 6M
 - Describe the different ways that styles can be added to a webpage. 6M

(OR)

- Explain the following input components in HTML forms with proper syntax of the corresponding HTML tags: 6M
i.Text Input. ii.Radio Buttons
 - Explain the concept of image map creation with suitable example. 6M

UNIT II

- Explain in detail about array methods. 6M
 - Write a Java Script code to search for a particular pattern in a string. 6M

(OR)

- Explain about Event Handling in Java Script. 6M
 - Write a Java Script code to find the factorial of a given number using functions. 6M

UNIT III

- What is a Parser? Compare DOM and SAX Parsers. 6M
 - Explain advantages and disadvantages of XML. 6M

(OR)

- What is XSLT? Apply the two XSLT constructs used for extracting data from three book xml elements where book xml contains child elements {title, isbn, author, price}. 12M

UNIT IV

- What is an AJAX? What are the steps to be followed by programmer to write AJAX based applications? 6M
 - Explain differences between traditional web application and AJAX enabled web application. 6M

(OR)

- Explain in detail about JQuery. 6M
 - Explain in detail about usage of XMLHttpRequest object in the application. 6M

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II/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION**March, 2018****Sixth Semester****Time:** Three Hours**Department of CSE & IT****Web Technologies****Maximum : 60 Marks***Answer Question No.1 compulsorily.*

(1X12 = 12 Marks)

Answer ONE question from each unit.

(4X12=48 Marks)

1	Answer all questions	(1X12=12 Marks)
	a) What is the purpose of img tag?	
	b) Write the structure of html document.	
	c) What is the Difference Between DHTML and HTML?	
	d) Write about background-position property.	
	e) How to declare an array in Java Script?	
	f) What are the built-in functions in Java Script?	
	g) What are rules for XML elements?	
	h) Write the syntax of attributes in DTD.	
	i) Difference between XML and Html.	
	j) What are callback functions in AJAX.	
	k) What is the difference between id and class?	
	l) What is DOM?	
UNIT I		
2	a) What is the importance of online form? Explain its attributes with a simple login form. Form tag – 2M Login form with attributes – 4M	6M
	b) Describe the different ways that styles can be added to a webpage. Inline CSS – 2M Internal CSS – 2M External CSS – 2M	6M
(OR)		
3	a) Explain the following input components in HTML forms with proper syntax of the corresponding HTML tags: i.Text Input. ii. Radio Buttons Text Input – 4M Radio Buttons – 4M	6M
	b) Discuss about 3-tier web architecture with neat diagram. 3-tier web architecture with diagram.- 6M	6M
UNIT II		
4	a) Explain in detail about Date object methods. Date object – 2M Methods – 6M	6M
	b) Write a Java Script code to search for a particular pattern in a string. Java Script code using either search (or) match method – 6M	6M
(OR)		
5	a) Explain about Event Handling in Java Script. Any 3 Event handling – 6M	6M
	b) Write a Java Script code to find the factorial of a given number using functions. Java Script code to find the factorial of a given number using functions – 6M	6M
UNIT III		
6	a) What is a Parser? Compare DOM and SAX Parsers. Parser – 2M	6M

		Compare DOM & SAX Parsers – 4M	
	b)	Explain advantages and disadvantages of XML. Any four advantages and disadvantages of XML.- 6M	6M
(OR)			
7	a)	What is XSLT? Apply the two XSLT constructs used for extracting data from three book xml elements where book xml contains child elements {title, isbn, author, price}. XSLT – 2M XSLT Program with XSL – 10M	12M
UNIT IV			
8	a)	What is an AJAX? What are the steps to be followed by programmer to write AJAX based applications. AJAX – 2M Steps to follow – 4M	6M
	b)	Explain differences between traditional web application and AJAX enabled web application. Differences between applications – 6M	6M
(OR)			
9	a)	Explain in detail about JQuery. JQuery – 6M	6M
	b)	Explain in detail about usage of XMLHttpRequest object in the application. XMLHttpRequest – 6M	6M