Hall Ticket Number:

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

April, 2017 **Common for all branches**

Fourth Semester **Engineering Mathematics -IV**

Time: Three Hours **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) Find the imaginary part of *l*og(-i).

b) State Cauchy-Riemann equations in polar form.

c) Evaluate $\int_C \frac{dz}{z-2}$, where 'C' is the circle $|z-2| = 1$.

d) If z = a is simple pole of f(z), then what is residue of f(z) at z = a?

e) Find the nature of singularity of $f(z) = \frac{z-\sin z}{z^2}$.

f) State Residue theorem.

g) If the distribution function of a random variable is given by $F(x) = \begin{cases} 1-\frac{1}{x^2}; & x>1 \\ 0 \quad ; & x \le 1 \end{cases}$,

Find the probability that this random variable will take on a value less than 3.

h) What is the mean and standard deviation of standard normal distribution?

i) The variance of a population is 2. The size of the sample collected from the population is 169. What is the standard error of mean?

j) What are the errors of sampling?

k) Define point estimation.

l) Define F-distribution.

UNIT I

2 a) Find all roots of the equations $(i)\sqrt[3]{1+i}$ $(ii)\, z^2+z+1=i$. 6M

b) Evaluate $\int_C \frac{z-1}{(z+1)^2(z-2)}dz$, using Cauchy's integral formula, where 'C' is $|z-i| = 2$. 6M

(OR)

3 a) Show that $u = e^{-x}$ (x siny – y cosy) is harmonic and find its conjugate harmonic. 6M

b) If $F(a) = \int_C \frac{4z^2+z+5}{z-a}dz$, where 'C' is the ellipse $\left(\frac{x}{2}\right)^2 + \left(\frac{y}{3}\right)^2 = 1$ then find the value of (i) F(3.5) (ii) F(i), $F^1(-1)$, $F^{11}(-i)$. 6M

UNIT II

4 a) Expand $f(z) = \cos z$ in powers of 'z – π/2'. 6M

b) Using the method of contour integration prove that $\int_{-\infty}^{\infty} \frac{dx}{x^4+1} = \frac{\pi}{\sqrt{2}}$ 6M

(OR)

5 a) Evaluate $\int_C \frac{z\cos z}{\left(z-\frac{\pi}{2}\right)^3}dz$ where 'C' is the circle $|z-1| = 1$, by using Cauchy's Residue theorem. 6M

b) Expand $f(z) = \frac{1}{(z-1)(z-2)}$ in the region (i) $|z| < 1$ (ii) $1 < |z| < 2$ (iii) $|z| > 2$. 6M

UNIT III

6 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 using normal approximation to binomial distribution (a) at most 15 will be defective; (b) exactly 15 will be defective? 6M

b) If the mean of breaking strength of copper wire is 575 lbs with a standard deviation 8.3 lbs. How large a sample must be used in order that there will be one chance in 100 that the mean breaking strength of the sample is less than 572 lbs. 6M

(OR)

7 a) If the joint probability density of two random variables is given by

$$f(x_1, x_2) = \begin{cases} 6\, e^{-2x_1 - 3x_2} & \text{for } x_1 > 0, x_2 > 0 \\ 0 & \text{elsewhere} \end{cases}$$

(i) Find the probability that the first random variable will take on a value between '1' and '2' and the second random variable will take on a value between '2' and '3'

(ii) Find the probability that the first random variable will take on a value less than '2' and the second random variable will take on a value greater than '2'. 6M

b) The chi square distribution with 4 degrees of freedom is given by

$f(x) = \begin{cases} \frac{1}{4}\, x\, e^{-x/2}; & \text{for } x > 0 \\ 0\,; & \text{for } x \leq 0 \end{cases}$. Find the probability that the variance of a random sample of size 5 from a normal population with $\boldsymbol{\sigma}$ = 12 will exceed 180. 6M

UNIT IV

8 a) An airline claims that only 6% of all lost luggage is never found. If, in a random sample, 17 of 200 pieces of lost luggage are not found, test the null hypothesis p = 0.06 against the alternative hypothesis p> 0.06 at the 0.05 level of significance. 6M

b) A sample of 400 items is taken from a population whose standard deviation is 10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. Also calculate 95% confidence interval for the population. 6M

(OR)

9 a) Experience has shown that 20% of a manufactured product is of the top quality. In one day's production of 400 articles only 50 are of top quality. Test the hypothesis at 0.05 level. 6M

b) A random sample of 100 teachers in a large metropolitan area revealed a mean weekly salary of Rs.487 with a standard deviation Rs.48. With what degree of confidence can assert that the average weekly salary of all teachers in the metropolitan area is between Rs.472 to Rs.500 6M

14IT 402

Hall Ticket Number:

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

April, 2017 **Information Technology**

Fourth Semester **Automata Theory & Formal Languages**

Time: Three Hours **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) Define NFA.
b) What is the relation between $\Sigma^* = \Sigma^+$?
c) What is regular expression? Give a suitable example.
d) Write the number of states in a smallest FA which accepts the language {x/length of x is divisible by 3}
e) Define CFL.
f) Is $(r^*)^* = r^*$?
g) What is meant by ambiguous grammar?
h) Explain the term satisfiability in TM.
i) How many ways can PDA accepts the string?
j) Why computability functions are needed in the context of TM?
k) Define Pumping lemma.
l) Define a Turing machine

UNIT I

2. a. Design DFA to accept the language L where L = {w/w has both an even number of 0's and even number of 1's}. 6M

b. Let L (language) be a set accepted by NFA. Show that there exists a DFA that accepts L. 6M

(OR)

3. a. Construct a DFA equivalent to the NFA given by M = ({p,q,r,s}, {0,1}, δ, p, {s}), where δ is defined in the following table

δ	0	1
p	{p,q}	{p}
q	{r}	{r}
r	{s}	{s}
s	{s}	{s}

6M

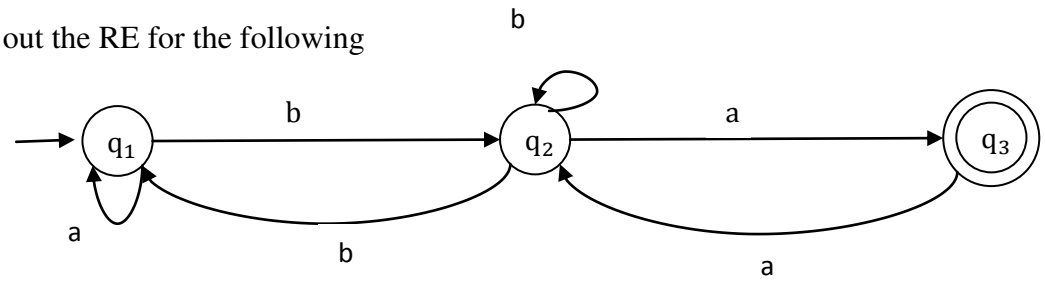
b. Design ∈-NFA for the following language. Try to use ∈-transitions to simplify your design. "the set of strings consisting zero or more a's followed by zero or more b's followed by zero or more c's.

UNIT II

4. a. Show that L = $\{0^n 1 0^{2n} / n \geq 0\}$ is not regular. 6M

b.

Find out the RE for the following



(OR)

5. a. Construct an FA for RE 10 + (0 + 11)0*1 6M
   b. Discuss briefly the algebraic law's for regular expressions. 6M

UNIT III

6. a) Let G be the grammar S→aB/bA
   A→a/aS/bAA
   B→b/bS/aBB.
   For the string 'aabbabab' find (i) right most derivation (ii) derivation tree. 6M

   b) Explain context free grammar. Construct a CFG generating all integers (with sign). 6M

(OR)

7. a. Convert the following grammar into CNF from G = ({S,A,B}, {a,b,c}, p, S) productions are S→ABa
   A→aab
   B→Ac 6M
   b. Construct a PDA that accepts the language L = $\{WCW^T / W \in \{a, b\}^*\}$. 6M

UNIT IV

8. a) Discuss about the Turing machine in detail. 6M
   b) Design a Turing machine for the language L = $\{a^n b^{2n} / n \geq 1\}$. 6M

(OR)

9. a. Write short notes on recursively enumerable languages. 6M
   b. State and explain post correspondence problem with suitable example 6M

14CS IT403

Hall Ticket Number:

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

April, 2017 **Common for CSE & IT**

Fourth Semester **Computer Organization**

Time: Three Hours **Maximum:** 60 Marks

Answer Question No.1 compulsorily. (1X12 = 12 Marks)

Answer ONE question from each unit. (4X12=48 Marks)

1. Answer all questions (12X1=12 Marks)

a) Define Throughput and Throughput rate.
b) Write basic performance equation.
c) What do you mean by out-of order execution? Is it Desirable?
d) What are virtual and logical addresses?
e) List out Various branching technique used in micro program control unit?
f) What is known as Multi-Phase clocking?
g) What is an index register?
h) What is write-through Protocol?
i) What is locality of reference?.
j) What is a Memory Controller?
k) What are the steps required for a pipelined processor to process the instruction?
l) What is DMA?

UNIT I

2. a) What is the addressing mode? Explain different addressing modes in detail. **(6M)**
b) Explain different functional units of a digital computer. Mention the functions of different processor registers i)IR ii)MAR iii)PC **(6M)**

(OR)

3. a) Write the procedure for integer division for dividing (101101)2 (45)10 by (000110)2 (6)10 **(6M)**
b) Write the use of Rotate & Shift instructions with examples. **(6M)**

UNIT II

4. a) Give the different instruction formats of a CPU in detail. **(6M)**
b) Explain horizontal and vertical organizations in micro programmed control. **(6M)**

(OR)

5. a) Give Booth's algorithm to multiply two binary numbers. Explain the working of the algorithm taking an example. **(6M)**
b) Explain in detail the principle of carry look ahead adder. Show how 16-bit CLAs can be constructed from 4-bit adders with an example. **(6M)**

UNIT III

6. (a) Explain detail the working of a micro programming control unit. **(6M)**
(b) What are handshaking signals? Explain asynchronous data transfer with hand shaking signals. **(6M)**

(OR)

7. (a) What are data hazards? Explain how data hazards effect pipelining. **(6M)**
(b) Discuss the various mapping schemes in cache design. Compare the schemes in terms of cost and performance. **(6M)**

UNIT IV

8. (a) Why is priority handling desired in priority controllers? How do the different priority schemes work? Explain **(6M)**
(b) What are Interrupt nesting? Briefly bring out the methods involved in the processor attending to simultaneous requests. **(6M)**

(OR)

9. (a) Discuss the main phases involved in the operation of SCSI bus in detail. **(6M)**
(b)Write short notes on (a) USB (b)PCI bus **(6M)**

14CS IT404

Hall Ticket Number:

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

April, 2017 **Common for 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)

1 Answer all questions (1X12=12 Marks)

a) What is a pseudo code?
b) What is the time complexity of Quick Sort?
c) Define optimality principle.
d) What is spanning tree?
e) What is the difference between Greedy method and Dynamic Programming?
f) List various representations of graph.
g) What is e-node?
h) What is a stack?
i) What is articulation point?
j) What is the difference between backtracking and Branch and Bound?
k) What is feasible solution?
l) What is P and NP?

UNIT I

2. What is time complexity and discuss various methods of evaluating time complexity of algorithm in detail by illustrating with examples. 12M

(OR)

3. a) Write short notes on Recursive algorithms. 4M
   b) Explain Merge Sort algorithm to sort the list of elements using Divide and Conquer technique. 8M

UNIT II

4. Write short notes on Minimum Cost Spanning Tree problem. Explain with example Kruskal's algorithm for finding minimum-cost spanning tree. 12M

(OR)

5. a) Write and explain the general method of Greedy method**.** 6M
   b) What is 0/1 Knapsack problem? Define merging and purging rules of O/1 Knapsack problem. 6M

UNIT III

6. a) Explain briefly about Breadth First Search and write the pseudocode for Breadth First Search . 8M
   b) Write short notes on Biconneted components. 4M

(OR)

7. a) Write the control abstraction of backtracking and write backtracking algorithm for n-queen problem. 8M
   b) Define the following i)Problem state ii)Answer state iii)State space tree 4M

UNIT IV

8. a) Explain the following
   i)Control Abstractions for LC – search.
   ii)FIFO branch and Bound 12M
   iii)LC Branch and Bound.

(OR)

9. a) Explain the method of reduction to solve TSP problem using Branch and Bound. 8M
   b) Write short notes on Complexity measures. 4M

14CS IT405

Hall Ticket Number:

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

April , 2017 — **GUI Programming**

Fourth Semester — **Common for CSE & IT**

Time: Three Hours — **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) Define object.
   b) Explain the use of Super keyword.
   c) List different access specifiers in Java.
   d) Write String functions.
   e) What is a collection in Java?
   f) What are the two ways used for creating user defined exceptions?
   g) What is delegation event model?
   h) What are the attributes of Applet tag?
   i) Write the syntax for creating simple panel in AWT.
   j) List some Event classes in java.
   k) Write short note on AWT components.
   l) Differentiate process and Thread.

UNIT I

2. a) Define a class which consist of properties and methods for Student 6M
   b) What is interface? Explain with an example program how an interface can extend another interface. 6M

(OR)

3. a) Define inheritance? Explain the types of inheritances with examples. 12M

UNIT II

4. a) Write a java program to use command – line arguments 6M
   b) Write the basic interfaces of Java Collection 6M

(OR)

5. a) Explain throws and finally keywords in Java with an example program. 6M
   b) Explain the concept of synchronization in Java with an example program. 6M

UNIT III

6. a) Define an Applet? Explain the life cycle of an applet with an example program 6M
   b) Write a Java application to handle Mouse Events and MouseMotion Events. 6M

(OR)

7. a) Explain types of streams (I/O) with example. 12M

UNIT IV

8. a) Write a Java Program to display simple File dialog box with supported AWT components 6M
   b) Explain various adapter classes 6M

(OR)

9. a) Explain the creation of JTables with an example program. 6M
   b) Discuss about JTabbedPane and how it can helpful to create multiple tabs? 6M

14CS/IT 406

Hall Ticket Number:

II/IV B.Tech (Regular/Supplementary) Degree Examination

April, 2017 **Common for CSE & IT**

Fourth Semester **Web Technologies**

Time: Three Hours **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=12Marks)

a) List and explain any two HTML elements
b) How to link external style sheet in CSS?
c) Write HTML code to create a web page containing background image.
d) How to define functions in java script?
e) Define the terms DOM Tree & DOM Node.
f) What is the use of <map> tag?
g) Differentiate well-formed and valid XML documents.
h) Mention the three technologies included in XSL.
i) What are the features of XML?
j) What is jQuery?
k) What is the use of XMLHttpRequest object?
l) What is the need of AJAX in developing web sites?

UNIT I

2 a) Discuss HTML form elements with example. 6M

b) Create a simple HTML page which demonstrates the use of various types of lists. Try adding a definition list which uses an unordered list to define term. 6M

(OR)

3 a) Explain the following terms related to CSS with examples. 6M

i) Font-size ii) Font-weight iii)Text-decoration
iv) Text-transform v) Padding vi) Border style.

b) Explain CSS border and background properties with example. 6M

UNIT II

4 a) Briefly explain about the following popup boxes in JavaScript with examples 6M

i) Alert Box ii) Confirm Box iii) Prompt Box

b) Briefly explain about arrays in javascript with an example program. 6M

(OR)

5 a) Explain about the following Events with suitable examples 6M

i) onload ii) onclick iii)onmouseover

b) What are the properties & methods of document object? Explain HTML DOM tree with an example. 6M

UNIT III

6 a) Write a valid XML document with external DTD. 6M

b) Discuss in details about features of XML. 6M

(OR)

7 a) Explain XML parsing process using XML converters. 6M

b) What is an XSLT? How to convert XML data into XHTML using XSLT. 6M

UNIT IV

8 a) Give the key difference between traditional synchronous web application and AJAX web applications. 6M

b) Discuss AJAX working model architecture with XHR objects methods. 6M

(OR)

9 a) Difference between jQuery and Java Script. 6M

b) Write an AJAX application to suggest the google names using jQuery. 6M