

501/19B

Roll No.

B.Tech Vth Semester
Examination: Nov-Dec, 2019
NUMERICAL METHOD & OPTIMIZATION TECHNIQUES
Paper No. MAT-301

Time: 2:30 Hrs

Max. Marks: 90

Note: Attempt five questions in all selecting one question from each section. Question No. 1 is compulsory.

- Q1. (a) After rounding of upto three significant figures the no. 6.4356 becomes (09*02=18)
- (i) 6.43 (ii) 6.44 (iii) 6.45 (iv) 6.42
- (b) The normal equation of $y = a + bx$ are
- (i) $\sum y = nb + \sum x$ (ii) $\sum xy = b\sum x + a\sum x^2$ (iii) both (i) and (ii) (iv) none of these
- $\sum y = na + b\sum x$ $\sum xy = a\sum x + b\sum x^2$
- (c) Bisection method is used to solve
- (i) Non linear equations. (ii) Transcendental equations (iii) both (i) and (ii) (iv) none of these
- (d) Which of the following is averaging operator
- (i) Δ (ii) μ (iii) ∇ (iv) ϵ
- (e) To apply weddle's rule n should be multiple of
- (i) 2 (ii) 3 (iii) 4 (iv) 6
- (f) If velocity and time are given then to find acceleration we used
- (i) Numerical differentiation of order one (ii) Numerical differentiation of order two
- (iii) Numerical Integration (iv) Taylor series method. ✓
- (g) A function of one variable $f(x)$ is said to have a relative or local minimum at $x = x^*$ y
- (i) $f(x^* + h) \leq f(x^*)$ (ii) $f(x^*) \leq f(x)$ (iii) $f(x^* + h) \geq f(x^*)$ ✓ (iv) $f(x^*) \geq f(x)$
- (h) State sufficient condition for a single variable optimization problem.
- (i) Search direction in univariate method is given by
- (i) $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$ (ii) $\begin{pmatrix} 0 \\ 1 \end{pmatrix}$ (iii) both (i) and (ii) (iv) $S_i = -\nabla f_i$ ✓

SECTION-A

- Q2. (a) Evaluate a real root of the equation (09)
- $x^3 - x - 11 = 0$ using Newton Raphson method.
- (b) Fit a straight line to the data: (09)
- | Years X: | 1961 | 1971 | 1981 | 1991 | 2001 |
|---------------|------|------|------|------|------|
| Production Y: | 8 | 10 | 12 | 10 | 16 |
- And find the expected production in 2006
- Q3. (a) Solve the following system of equations by Gauss Seidal method (09)
- $10X + Y + Z = 12$, $2X + 10Y + Z = 13$, $2X + 2Y + 10Z = 14$
- (b) Solve the system of equations by Gauss-Jordan Method (09)
- $X + 3Y + 3Z = 16$, $X + 4Y + 3Z = 18$, $X + 3Y + 4Z = 19$

SECTION-B

Q4. (a) Prove that

(09)

$$(i) \Delta = \frac{1}{2} S^2 + S \sqrt{1 + \frac{S^2}{4}}$$

$$(ii) \Delta = E \nabla = \nabla E = \delta E^{1/2}$$

(b) Frame the following table, find Y when X = 1.85 by Newton's Interpolation formula

(09)

X: 1.7 1.8 1.9 2.0 2.1 2.2 2.3

Y=E^X: 5.474 6.050 6.686 7.389 8.166 9.025 9.974

Q5. (a) Obtain Newton's divided difference interpolation polynomial and hence find f(6)

(09)

X: 3 7 9 10

f(X): 168 120 72 63

(b) Evaluate $\int_0^1 \frac{1}{1+x^2} dx$ Using

(09)

(i) Simpson's 1/3rd rule, taking h = 1/4

(ii) Simpson's 3/8th rule, taking h = 1/6

SECTION-C

Q6. Find the value of x in the interval (0, 1) which minimize the function f(x) = x(x-1.5) by golden section (18)

Method with x=4.

Q7. (a) Write any four applications of optimization. (04)

(b) Find the minimum of f = $\lambda^3 - 6\lambda^2 - 18\lambda + 10$ by cubic interpolation method. Solve up to two iterations. (14)

SECTION-D

Q8. Minimize of f = $2x_1^2 + x_2^2$ from starting point (1,2) using the univariate method (Three iteration only) (18)

Q9. Minimize z = $12x_1 + 21x_2 + 2x_1x_2 - 2x_1^2 - 2x_2^2$ (18)

subject to the constraints

$$x_2 \geq 8$$

$$x_1 + x_2 \geq 10$$

$$x_1, x_2 \geq 0$$

using Kuhn - Tucker conditions.

Time: 2.30 hours

Max.Marks:90

Attempt any five Questions in all selecting at least one question from each section. Question no.1 is Compulsory.

- Q.1 (a) What is the use of AD0-AD7 lines in 8085? 04
 (b) Describe the difference between the instruction MOV AX, 2450H and MOV AX, [2450H] 04
 (c) What is the difference between Static and Dynamic RAM. 05
 (d) What is the difference among RAM, ROM and Hard disk? 05

SECTION A

- Q2. Explain briefly register section and interrupt section of architectural block diagram of 8085. 18
 Q3. Write an ALP to find the smallest number from given unordered array of 8 bit numbers, stored the location starting from a known address, 18

SECTION B

- Q4. (a) What is addressing modes of 8086? Explain each with at least two examples. 09
 (b) Explain Memory segmentation in 8086? Explain how is it helpful while addressing the memory 09
 Q5. (a) Explain architectural diagram of 8086. 18

SECTION C

- Q6 Explain various looping and branching instructions with their syntax and use. also give one example of each, 18
 Q7. (a) What are assembly directives? how these are different from instruction? what are the advantages and disadvantages 09
 (b) Explain interrupts of 8085. What are Interrupt Service Routine (ISR) and Interrupt Vector Table (IVT). Explain the steps of interrupt if being occurred. 09

SECTION D

- Q8. What is direct memory access? Explain its working in details. 18
 Q9. Explain programmable peripheral interface 8255. what is BSR mode? explain in brief 18

539/19B

Roll No. 406

B.TECH 5th Semester Exam, Nov-Dec-2019
Computer Graphics & Multimedia
(Paper No. : CSE-307)

Max. Marks: 90

Time: 2.30 Hours

Note *: Attempt any five questions in all selecting at least one question from each section. All Questions carry equal marks. Question number 1 is compulsory.

6x3=18

Que-1: Attempt all.

- a) Fill in the blanks.
- i) In computer graphics, short form of picture element is called pixel.
 - ii) In LCD, the refresh rate of the screen is 3260.
 - iii) Bezier curve are used to produce smooth curves at all scales.
 - iv) Scaling is used either to increase and decrease the size of object.
- b) Write Short notes on the following
- i) Direct View Storage Tubes.
 - ii) Stereoscopic & Virtual Reality Systems.

Section - A

Q.-2 Explain Raster scan systems and Random scan systems in detail.

18

- Q.-3 a) What are various applications of multimedia in industry?
b) Explain Video display devices.

09

09

Section - B

Q. 4 Explain multimedia system architecture and multimedia database in detail.

18

- Q.5- a) Discuss the DDA Line drawing algorithm in detail.
b) Explain Line and polygon clipping with example.

09

09

Section - C

- Q.-6 a) What is Depth Buffer Method explain.
b) Explain some image compression methods.

09

09

Q.-7 What is window to viewport coordinate transformation? describe with example.

18

Section - D

- Q. 8- Explain multimedia authoring tools.
b) Explain digital representation of sound.

09

09

Q.9- Explain the Scanline and Area subdivision method of surface detection.

18

B. Tech (CSE) Vth SEM
Examination, Oct-Nov, 2019
Python Programming & Machine Learning
Paper No: CSE-301

Time: 2:30 Hours

Max. Marks: 90

Note: Attempt Five question in all. At least one question from each section. Question-1 is compulsory.

3x6

1. Write a short note on:
 - a. Future scope of Artificial Intelligence
 - b. Discuss Active learning
 - c. Explain with examples 'Decision Trees'

Section A

18

2. What are different applications of Python? Give examples.
3. Write a Python program to convert height in feet and inches to cm.

[1 feet = 12 inch and 1 inch = 2.54 cm]
(Sample input: 2 feet 7 inch Sample output: 78.74 cm)

Section B

18

4. List and explain different arithmetic operators supported by Python. Discuss about their precedence and associativity.
5. Explain A* searching technique in detail with example. Discuss conditions for the optimality of this technique.

Section C

6. How to create, raise and handle user defined exceptions in Python ? 18
7. Explain searching and sorting algorithms with example. 18

Section D

8. List various components of natural language understanding process. Describe syntactic analysis and schematic analysis in brief. 18
9. Write a short note on : 18
 - a. Applications of Machine Learning
 - b. What is Learning ? Explain its types.

Gr. Marks

B.Tech V-Semester Examination, 2019
Theory of Automata & Computation

Paper No. CSE-303

Time: 2:30 Hours

Maximum Marks: 90

Note: Question 1 is compulsory. Attempt any one question from each section A, B, C and D. All questions carry equal marks.

1. Attempt all Questions.

[6 x 3 = 18]

- State and prove Arden's method.
- Briefly explain Myhill-Nerode Theorem.
- Construct a PDA equivalent to the following grammar:
 $S \rightarrow aAA, A \rightarrow aS|bS|a$
- Explain the Halting problem of Turing machine.
- What do you mean by unrestricted grammar?
- What is pumping lemma?

Section-A

2. (a) Give regular expressions for the following languages on $\Sigma = \{a, b, c\}$

[9]

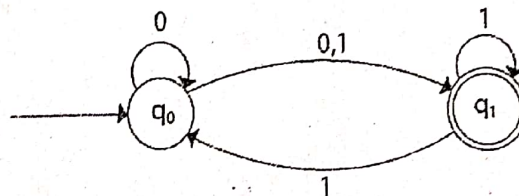
- all strings containing no more than three a's
- all strings containing exactly one a.
- all strings in which all runs of a's have lengths that are multiples of three.

(b) Design a DFA which accepts even number of a's over the alphabet $\{a, b\}$.

[9]

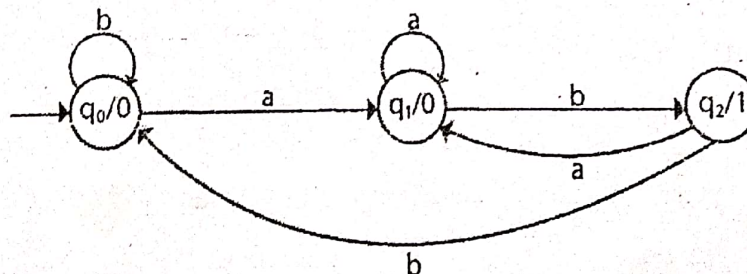
3. (a) Convert the following NFA to DFA.

[9]



(b) Convert the given Moore machine into its equivalent Mealy machine.

[9]



Section-B

4. (a) Using pumping lemma for the context free language, prove that the following language is not context free: [9]

$$L = \{ \{a^p\} \mid p \text{ is a prime number} \}$$

- (b) Consider the following productions: [9]

$$\begin{aligned} S &\rightarrow aB|bA \\ A &\rightarrow aS|bAA|a \\ B &\rightarrow bS|ABB|b \end{aligned}$$

For the string aaabbabbba, find

- (i) The leftmost derivation
- (ii) The rightmost derivation and
- (iii) Parse tree

5. (a) Find a grammar in GNF equivalent to the grammar $E \rightarrow E+T \mid T, T \rightarrow T^*F \mid F, F \rightarrow (E) \mid a$. [9]

- (b) (i) Show that $L = \{a^n b^n c^n \mid n \geq 1\}$ is not context free but context sensitive. [9]
 (ii) Show that the following grammar is ambiguous.

$$\begin{aligned} S &\rightarrow aB|ab \\ A &\rightarrow aAb|a \\ B &\rightarrow ABb|b \end{aligned}$$

Section-C

6. (a) Construct a PDA accepting the set of all even length palindrome over $\{a,b\}$ by empty store. [9]
 (b) Write transition rules for a PDA corresponding to the following Context Free Language: [9]
 $L = \{wcw^R \mid w \text{ is in } (0+1)^* \text{ and } w^R \text{ represents reverse } W\}$
7. (a) Design a Turing machine M to recognize the language $\{1^n 2^n 3^n \mid n \geq 1\}$ [9]
 (b) What is Turing Machine? Design a Turing machine that enumerates $\{0^n 1^n \mid n \geq 1\}$. [9]

Section-D

8. Write and briefly explain the characteristics of each class of grammar classified according to Chomsky hierarchy. Also explain the relation between languages of classes under Chomsky classification with the help of diagram. [18]
9. (a) Explain the following: [9]
 (i) Computability
 (ii) primitive recursive functions
- (b) What are Primitive recursive function? Show that the following function is primitive recursive: [9]
 $f(x, y) = x - y$

537/198

B.TECH 5th Semester
Examination –Dec, 2019
CORE JAVA PROGRAMMING

Paper : CSE-305

[Maximum Marks : 90]

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The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus, Student will have to attempt 5 questions out of 9 questions.

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Note : Question No. 1 Compulsory.

1. Briefly explain the following: -

2*9

1.1 Which of these operators is used to allocate memory to array variable in Java?

☒ a) malloc

b) alloc

c) new

d) new malloc

1.2 Can 8 byte long data type be automatically type cast to 4 byte float data type?

a) True

☒ b) False

1.3 When does method overloading is determined?

☒ a) At run time

b) At compile time

c) At coding time

d) At execution time

1.4 Modulus operator, %, can be applied to which of these?

a) Integers

b) Floating – point numbers

☒ c) Both Integers and floating – point numbers

d) None of the mentioned

1.5 What is the range of short data type in Java?

a) -128 to 127

☒ b) -32768 to 32767

c) -2147483648 to 2147483647

d) None of the mentioned

1.6 Which of this keyword must be used to inherit a class?

a) super

b) this

☒ c) extent

d) extends

1.7 Which of these method of ArrayList class is used to obtain present size of an object?

a) size()

☒ b) length()

c) index()

d) capacity()

1.8 Which of this method of class String is used to obtain a length of String object?

a) get()

b) Sizeof()

☒ c) lengthof()

d) length()

1.9 Which of these are types of multitasking?

a) Process based

☒ b) Thread based

c) Process and Thread based

d) None of the mentioned

UNIT 1

2. a. Explain data abstraction, encapsulation, information hiding with example. 9
b. Explain static method and static variable with the help of example. 9
3. What do you understand by access modifiers? Explain all access modifiers that are related
Visibility with proper example. 18

UNIT 2

4. a. What is interface, why it is important in java programming? 9
b. Explain the difference between string and string buffer class with example. 9
5. What is Inheritance? Explain multilevel, hierarchical inheritance with suitable program. 18

UNIT 3

6. What is Exception handling? Explain the difference between Checked Exception and
Unchecked Exception. Explain them with example. 18
7.a Explain the concept of event handling. 9
b. what is adapter classes. Explain them with example. 9

UNIT 4

8. Write a program in Swing to add two number and display result in any text field. 18
9. a. Explain life cycle of thread with example. 10
b. Write a program in thread to demonstrate the thread priority. 8