Roll No.....

Dr B R Ambedkar National Institute of Technology, Jalandhar

B Tech (CSE)

CSX-308 Computer Graphics and Animation

End Semester Examination

Duration: 3 Hours Max. Marks: 50 Date: 11th May 2019

Note:

1. Attempt all the questions
2. Mention assumptions if any

Mapping of questions with Course Outcomes										
Q. No.	1	2	3	4	5	6	7	8		
CO No.	3	2,4	3,2	4	4	3,2	1,4	3,4		
DL	3	2	3	2	3	2	2	2		

CO: Course Outcome; DL: Difficulty Level.

A (a) Obtain 2 point perspective projection of unit cube obtained by rotating the cube 30 degree about y-axis and translating it by (0,3,-3) and the center of projection is at (0,0,2).

(b) Which is the most commonly used method to detect hidden surfaces? Explain in detail with a suitable example. (3+3=6)

2. (a) Rotate point P(1,-1,-1) 45 degree clockwise about the axis given by points A(1,2,1) and B(2,1,4).

(b) Discuss various problems in painter's algorithm with the help of an example.

(3+2=5)

3. (a) Suppose a window is defined as(-20,20) and(60,60) in the world coordinate system. Consider a line segment whose endpoints are given by (-30,0) and (80,40)

3.5 i. Determine region codes of the endpoints

1.5 ii. Find the intersection of line segment with appropriate window.

iii. Assume that a viewport is defined by (10,30) and (200,130).Find the viewport co-ordinates for the intersection points.

(b) Plot a line from (1,2) to (12,18) using Bresenham's line drawing algorithm. (3.5+2.5=6)

4. (a) How we can transform view of an object which is defined in world co-ordinate system into view reference co-ordinate system. Discuss.

(b) What is the difference between control points and knots? Discuss their role in the designing of curves.

(c) What will be the new points of unit square when shearing is applied along x-axis and y-axis in each individual case. Values of Shx=Shy=2.

(2+2+2=6)

5. (a) A square is defined by vertices A(0,0),B(0,2),C(2,2) and D(2,0).Compute new co-ordinates of a square after performing a rotation of 45 degree about point P(3,2).

(b) Draw an ellipse using midpoint ellipse drawing algorithm with input ellipse parameter rx=7and ry=4 and the center of ellipse is(5,5).

(2+3=5)

6. (a) Use the Liang-Barsky algorithm to clip the lines where window is defined by (1,1) and (9,7).Clip the following line segments whose endpoints are

A(3,2) and B(6,5)
E(2,5) and F(5,8).

(b) Define the following :

i. VUP and VRP
ii. Approximation and Interpolation.

(c) Derive the expression for Mid Point Circle generation algorithm.

(3+2+3=8)

7. (a) What do you mean by emissive and non-emissive displays? Discuss the working of plasma panels in detail.

(b) Derive expression for Hermite Blending functions and also discuss under which conditions hermite polynomials are useful ?

(c) How Gouraud shading is different from Phong shading? Discuss it with a suitable example.

(2+3+3=8)

8. (a) List 4 differences between perspective and parallel projections.

(b) What are the different data structures which are used in scan line polygon filling and also discuss how these elements are used in processing.

(3+3=6)

(Roll No .....)

Dr B R AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY, JALANDHAR
DEPARTMENT OF COMPUTER SCIENCE ENGINEERING
B.Tech 6th SEMESTER
Final Examination (AY Jan-June 2019)
CSX-310 Web Technologies

Duration: 3 Hrs. Max. Marks: 50

Notes: Attempt all the Questions. Make assumption were necessary.

Mapping of questions with Course Outcomes										
Q. No.	1	2	3	4	5	6	7	8	9	10
CO No.	1,2	2	3	2,3	2	3	2	3	3	2
DL	1	2	2	3	2	2	2	3	3	2

CO: Course Outcome; DL: Difficulty Level

1. Create, test and validate an HTML document to describe unordered list of a typical supermarket shopping list (5)
2. What is a CSS Selector? What are the different types of CSS? (5)
3. What is the difference between SAX and DOM parser in java? (5)
4. Explain call back in EJB? What are the call back annotations for stateless bean? What are the callback annotation for stateful bean? (5)
5. List and explain the difference between CGI Script and Java? (5)
6. Compare web server and application server with suitable example? (5)
7. Explain MVC Model in JSP with neat diagram? (5)
8. Compare and Distinguish between SOAP and REST (5)
9. What is Session Tracking in Servlet with example? What are the different session tracking methods? (5)
10. Write short notes on JDBC model with suitable examples (5)

Roll No. 16153A.....

Dr B R Ambedkar National Institute of Technology, Jalandhar
B Tech (Computer Science and Engineering)
CSX-332 (Advanced Operating System)
End Semester Examination

Duration: 3 Hours Max. Marks: 50 Date: 16th May 2019

Note:

1. Attempt all the questions

Mapping of questions with Course Outcomes										
Q. No.	1	2	3	4	5	6				
CO No.	1	2	3	3	4	5				
DL	2	1	2	3	3	1				

CO: Course Outcome ; DL: Difficulty Level.

1. (a) How does monitor works in process synchronization? Give the syntax of monitor.

(b) What are the necessary conditions of deadlock?Give differences between semaphores and mutex. (5+5)

2. (a) Discuss different classical synchronization problems.

(b) Can more than one process execute the same code? What happens when a semaphore is deleted? In particular, what happens to the processes that are waiting on a semaphore queue when the semaphore is deleted? (5+5)

3. (a)In Lamport's algorithm,condition L1 can hold concurrently at several sites.Why then is L1 needed to guarntee mutual exclusion?

(b)Compare the performances of non-token based and token based algorithms.Explain with example. (5+5)

4. (a) Show that in Ricart-Agrawala algorithm, the critical section is accessed according to the increasing order of timestamps?
(b)Describe the architecture of multiprocessor operating system. What is cache coherence problem? Explain with example. (5+5)

5. (a) Show that in the RSA method to implement the public key cryptography, when p=5 and q=7, both e and d are 11 .

(b) What is DES? In asymmetric cryptography, which cryptographic protocol is used to secure HTTP connection? (2+3)

6. (a) Mention the characteristics of Parallel programming.

(b) Explain the architecture of Distributed file system. (2+3)

Dr B R Ambedkar National Institute of Technology, Jalandhar

B Tech (Computer Science and Engineering)

Engineering Economics and Industrial Management

HMX-201

End Semester Examination

Duration: 3 Hours Max. Marks: 50 Date: 21st May 2019

Note:

1. Attempt all the questions
2. All the parts of same question must be attempted together.
3. Answer in proportion to the marks assigned to the questions. Writing undesirably long answers cannot fetch marks more than maximum.
4. Write your roll number, exam details and date on graph paper also.

Mapping of questions with Course Outcomes										
Q. No.	1	2	3	4	5	6	7	8	9	
CO No.	1	1	2	2	3	3	4	4	4	
DL	2	2	2	2	2	2	2	2	2	

CO: Course Outcome; DL: Difficulty Level.

1. A budding entrepreneur is planning to setup a handmade cardboard unit. He has made following annual estimates:

Fixed Cost	Rs. 1,00,000
Estimated Sales	Rs. 3,00,000
Variable Cost	Rs. 5 per unit
Selling Price	Rs. 30 per unit

Construct the breakeven chart and find the following:

(i) The minimum sale required for justifying the business proposal. What is this point called?

(ii) If the annual turn-over is Rs, 1,80,000, will the business make profit? How much it will be? (5)

2. (a) "Decision making is the essence of Management". Do you agree to the statement? Justify your opinion quoting the situations of certainty, uncertainty and conflict.

(b) Draw a flowchart showing steps in decision making procedure. (4+2)

3. (a) "Prevention is better than cure". Write a paragraph justifying the quote in context of replacement and maintenance analysis.
(b) How the factors Deterioration, Obsolescence and Inadequacy are important in Replacement decision? Give suitable examples when each of these factors is the dominating cause of recommendation for replacement of an equipment is an Industrial plant. (3+4)

4. (a) A machine costing Rs. 24 lacs was purchased on 1st January 2015. The installation and erection charges were 1 lac. Useful life of the machine is expected to be 10 years. The anticipated scarap value of the machine at the end of its predicted useful life is Rs. 5 Lacs. Calculate the yearly depreciation by stsraight line method.

(b) When does scrap value become negative? (4+1)

5. (a) "Safety Stock is a necessary evil". How?

(b) Inventory in an organization (manufacturing as well as service) consists of thousands of different items in stock. The control of all these items is a serious management problem, if the same extent of control is exercised on each of these items. How ABC analysis rescues managers out of this severe management problem? Take example of your department head and give examples of few items which he might have categorized according to the principles of ABC analysis. (2+4)

6. (a) "Using past to predict the future" is practiced as a technique of demand forecasting. When do we prefer such techniques, for short range or long range forecasts? Why?

(b) Describe how a democratic consensus is arrived at using DELPHI method? How conflicts are avoided during execution of the process? (3+3)

7. (a) Enlist factors favoring "MAKE" decision and disapproving "OUTSOURCING"?

(b) Is going for collaboration or partnership a mid-way between make or outsource decisions? Suppose you are Mr. Rajat Obroi the owner-promoter of a big business empire. Give an example of a situation when you would drop both the exclusive making of an item at one of your own already existing facilities or exclusive outsourcing to some other firm. Instead, you decided to strike partnership with another organization to manufacture the item in a joint venture?

(2+4)

8. (a) Define value.
   (b) Describe briefly three major advantages of applying value engineering techniques? (1+2)

9. Three grades of coal (Grade-1, Grade-II and Grade-III) contain phosphorous and ash as impurities. In a particular industrial process, fuel up to 100 ton is required which should contain ash not more than 3% and phosphorous not more than 0.03%. It is desired to maximize the profit while satisfying these conditions. Note that there is an unlimited supply of all the three grades freely available. The percentage of impurities and the profit corresponding to different grades are given as below:

Coal Grade	Phosphorous (%)	Ash (%)	Profit in Rs. Per ton
I	0.02	2.00	12
II	0.04	3.00	15
III	0.03	5.00	14

Find the proportions in which the three grades should be used? Use Simplex method. Perform two iterations only. (6)

डा बी आर अम्बेडकर राष्ट्रीय प्रौद्योगिकी संस्थान, जालन्धर

Dr B R Ambedkar National Institute of Technology, Jalandhar

Department of Computer Science and Engineering

B.Tech. (CSE) 6th Semester

CSX-302 (Theory of Computation)

End Semester Examination

Duration: 3 Hours | Max. Marks: 50 | Date: 7th May 2019

Note:

1. *Attempt all the questions*
2. *This Question Paper Consists of 10 Questions and 3 Pages.*

Mapping of questions with Course Outcomes										
Q. No.	1	2	3	4	5	6	7	8	9	10
CO No.	2	2	3	1	1	2	3	4	4	1
DL	2	2	3	2	3	2	3	3	3	1

CO: Course Outcome; DL: Difficulty Level.

1. (a) If each production in a grammar G has some variable on right-hand side, what can you say about L(G)?

   (b) Construct following grammars to generate the language $L = \{p^n | n>=1\}$

   i. a context-sensitive but not context-free grammar

   ii. a context-free but not regular grammar

   iii. a regular grammar (2+3)

2. (a) How many strings of length 5 or less can be generated by the regular set represented as the following regular expressions:

   i. (ab+a)*(aa+b)

   ii. a* +(ab+a)*

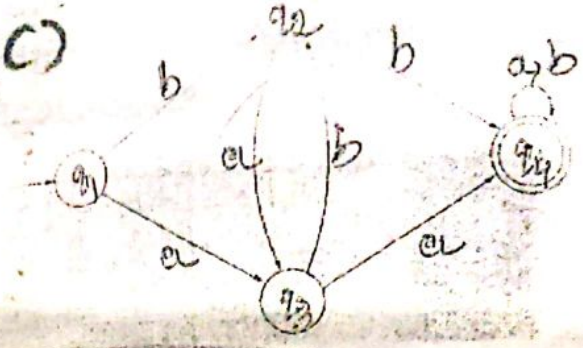
   (b) Write the regular expressions representing the following sets:

   i. Let Σ = {a, b, c}. Give a regular expression for the all strings containing no more than three a's.

   ii. Let Σ = {0, 1}. Write a regular expression for all strings not ending in 01.

   iii. Let Σ = {a, b}. Give a regular expression for the all strings which do not contain the substring 'ba'. (2+3)

3. (a) Find a regular grammar accepting the set recognized by the finite automaton:



(b) Construct a complete deterministic finite automaton to the grammar:

$S \rightarrow aS \mid bS \mid aA$

$A \rightarrow bB$

$B \rightarrow aC$

$C \rightarrow \varepsilon$

4. (a) A context free grammar G =({S,A,B},{0,1,2,3},P,S) has the following productions:

$S \rightarrow 0S0 \mid 1S1 \mid A$

$A \rightarrow 2B3$

$B \rightarrow 2B3 \mid 3$

Describe the language generated by the parameters.

(b) Consider G=({S,A,B},{a,b},P,S), where P consists of

$S \rightarrow AB \mid ab$

$B \rightarrow b$

What will be the sequence of steps to find the reduced grammar? Show that if the sequence of steps is reversed, then we may not get a reduced grammar. (2+3)

5. Construct a context free grammar with one variable generating the following language $L=\{wcw^r \mid w \in \{a,b\}^*\}$. Convert the above grammar into Chomsky Normal Form and Greibach Normal form. (1+2+2)

6. (a) If $w \in L(G)$ and $|w|=k$, where G is in (i) Chomsky normal form (ii) Greibach Normal form, what can you say about the number of steps in the derivation of w?

(b) Are the following statements true or false? Support your answer by giving proofs or counter examples.

i. If L1 and L2 are context free languages, then L1∪ L2 is also context free.

ii. If L1 and L2 are context free languages, then L1∩ L2 is also context free. (2+3)

7. Let L= $\{a^m b^n | \ n<m, \ m>=1\}$ Construct a context free grammar accepting L and convert that grammar to PDA by empty store. (2+3)

8. (a) Consider the Turing machine M;

$M= (Q, \sum, \Gamma, \delta, q0, B, F)$

and δ is defined by

$\delta(q_0, a)= (q_1, a, R)$

$\delta(q_1, b)= (q_2, b, R)$

$\delta(q_2, a)= (q_2, a, R)$

$\delta(q_2, b)= (q_3, b, R)$

q3 is final state.

Find the language accepted by above Turing machine with proper *justification.*

(b) Design a turing machine with its transition diagram that recognizes all the palindrome strings of odd length over (0, 1). (2+3)

9. (a) Design a turing machine which computes the following function: f(n)= {n-2 if n>2 and 0 otherwise} for positive integer n.

(b) What do you mean by undecidable problems? Prove that 'Halting problem of Turing machine is undecidable'. (2+3)

10. (a) If a language L and its complement are both recursively enumerable then L is recursive language. Is it true? Justify your answer.

(b) What is PCP? Consider the following two lists: F=(11,111,001,010) and S=(10110,000,0101,0) Is this PCP has a solution? (2+3)

B Tech (Computer Science & Engineering)

CSX-306 System Programming

End Semester Examination

Duration: 3 Hour Max. Marks: 50 Date: 9th May 2019

Note:

1. Attempt all the questions

Mapping of questions with Course Outcomes										
Q. No.	1	2	3	4	5	6	7	8		
CO No.	1	1	2	3	2	2	3	3		
DL	2	2	1	3	1	2	3	3		

CO: Course Outcome ; DL: Difficulty Level.

Q1. Demonstrate and compare radix exchange and bucket sort techniques for the list
19,13,5,27,1,26,31,16,2,9,11,21. *(6)*

Q2. Comment whether you would prefer a generative schematic or an interpretive schematic for the following purposes:

a) Implement display commands issued during dynamic programming.
b) Producing a report from a file.
c) Writing a general purpose screen handling system.
d) Handling data base queries.

Give reasons for answers. (4)

Q3. Discuss the problem of deletion of entries in the following symbol table organizations:

a. Sequential search organization
b. Binary search organization

c. Hash table organization with rehash and overflow chaining techniques
d. Linked list and tree-structured organizations

(6)

Q4. Consider the following source program on a hypothetical computer, which supports four registers AREG, BREG, CREG & DREG contains 11 Mnemonic operation codes from 00 to 10 viz STOP, ADD,SUB, MULT,MOVER,MOVEM, COMP, BC, DIV, READ, PRINT. DS as label and LTORG as advanced assembler directive.

```
            START    100
A           DS       3
L1          MOVER    AREG, B
            ADD      AREG, C
            MOVEM    AREG, D
D           EQU      A+1
L2          PRINT    D
            ORIGIN   A-1
C           DC       '5'
            ORIGIN   L2+1
            STOP
B           DC       '19'
            END      L1
```

a. Show the contents of the symbol table at the end of Pass I.
b. Explain the significance of EQU and ORIGIN statements in the program and explain how they are processed by the assembler.
c. Show the intermediate code generated for the program

(8)

Q5. Compare and contrast the properties of macros and subroutines with respect to the following:

e. Code space requirements
f. Execution speed
g. Processing required by the assembler
h. Flexibility and generality.

(4)

Q6.

a. It is proposed to perform dynamic linking and loading of the program units constituting an application. Comment on the nature of the information which would have to be maintained during the execution of a program.

b. Comment on the following statements:

x. Self-relocating programs are less efficient than re-locatable programs?

y. There would be no need for linkers if all programs are coded as self-relocating programs. (3+3)

Q7. Build a control flow chart for the following:

```
z:= 5;
w:=z;
for i:=1 to 100 do
    x:=a*b;
    y:=c+ d;
 if y<0 then
        a:=25;
        f:=c+d;
  else
      g:=w;
      h:=a*b + f;
      d:=z+10;
end;
g;= c+d;
print g,h,d,x,y;
```

Apply following:

a) Common Subexpression elimination
b) Dead code elimination
c) Constant propagation
d) Frequency reduction. (10)