

Roll No [16110023]

दा वी आर अम्बेडकर राष्ट्रीय प्रौद्योगिकी संस्थान, जालन्धर

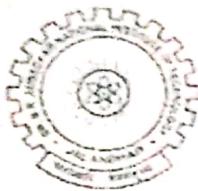
Dr B R Ambedkar National Institute of Technology, Jalandhar

Department of Computer Science and Engineering

B.Tech. (CSE) 6<sup>th</sup> Semester

Minor- I (7<sup>th</sup> February, 2019)

CSX-302 (Theory of Computation)



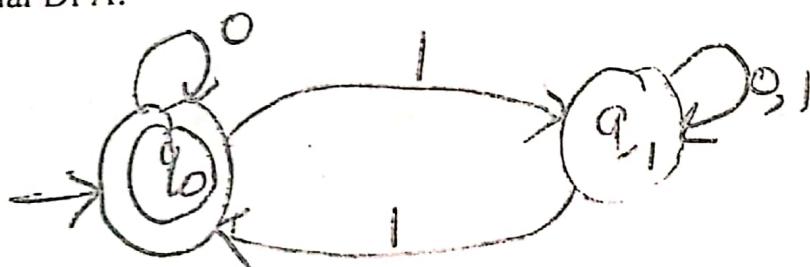
Time Allowed: 1 hr

MM-20

This Question Paper Consists of 7 Questions and 2 Pages

Note: Attempt all Questions.

- 1) Find the language generated by grammar  $G=(\{S,A,B\}, \{0,1,2,3\}, P, S)$ , where  $P$  is defined as:  $S \rightarrow AB, A \rightarrow A1|0, B \rightarrow 2B|3$ . Write the type of the given grammar with proper explanation. Can the above language be generated by a grammar of higher type? If yes, write the grammar and if no, give reason. (3)
- 2) Construct a transition system which can accept the strings over the alphabet  $a,b,c,\dots,z$  containing substrings either 'bat' or 'mat'. (3)
- 3) Write the regular expression for each of the following languages over alphabet  $\{p,q\}$ 
  - a)  $L = \{p^nq^m \mid n \geq 5, m \leq 4\}$
  - b)  $L = \{p^nq^m \mid n+m \text{ is even}\}$
  - c)  $L = \{w \in (p,q)^*, \ n_q(w) \bmod 4 = 0\}$  (3)
- 4) Convert the following NFA to DFA. Also write the regular grammar for the final DFA. (1+2)

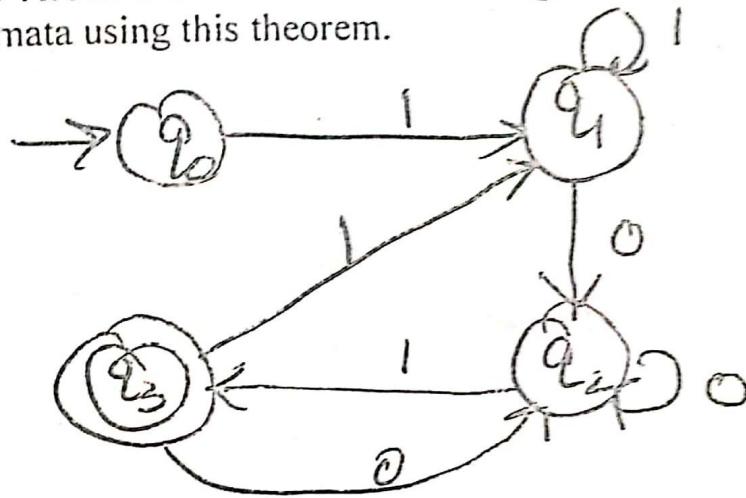


- 5) Design a complete DFA for a set of strings over alphabet  $\{0,1\}$  having substring 110 or 101. (3)

8  
20

got:  
13.5  
20

- 6) State Arden's theorem. Write the regular expression for the following automata using this theorem.



(1+2)

- 7) Construct a context free but not a regular grammar to generate the language  $L = \{(ab)^n | n \geq 1\} \cup (ba)^n | n \geq 1\}$  (2)

Roll No [...] 1631023

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Dr B R Ambedkar National Institute of Technology, Jalandhar

Department of Computer Science and Engineering

B.Tech. (CSE) 6<sup>th</sup> Semester

CSX-302 (Theory of Computation)

Minor- II Examination

Duration: 1 Hour

Max. Marks: 20

Date: 28<sup>th</sup> March 2019

*This Question Paper Consists of 5 Questions and 2 Pages.*

**Note:** Attempt all Questions.

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

CO: Course Outcome; DL: Difficulty Level.

1. Design a Moore Machine which gives output 'Y' if the input string contains the sequence 'bab' otherwise gives output 'N' over the alphabet {a,b}. Convert this Moore Machine into Mealy Machine.

(3+2)

2. Construct a CFG for the following PDA:

$M = (\{q_0, q_1\}, \{0, 1\}, \{z_0, x\}, \delta, q_0, z_0, \phi)$  and  $\delta$  is given by

$$\delta(q_0, 1, z_0) = \{(q_0, xz_0)\}$$

$$\delta(q_0, \epsilon, z_0) = \{(q_0, \epsilon)\}$$

$$\delta(q_0, 1, x) = \{(q_0, xx)\}$$

$$\delta(q_1, 1, x) = \{(q_1, \epsilon)\}$$

$$\delta(q_0, 0, x) = \{(q_1, x)\}$$

$$\delta(q_1, 0, z_0) = \{(q_0, z_0)\}$$

(3)

3. Construct a context free grammar generating for following language and hence a pda accepting it by empty store

$$L = \{a^n b^n | n \geq 1\} \cup \{a^m b^{2m} | m \geq 1\}$$

(3+2)

4. What do you mean by CNF? Find a grammar in CNF equivalent to  $G = (\{S, A, B\}, \{a, b\}, P, S)$ , where  $P$  is defined as:

$$S \rightarrow aAbB$$

13  
20

$$A \rightarrow aA|B$$

$$B \rightarrow bB|b$$

(2+3)

5. What is ambiguous grammar? If  $G$  is the grammar and  $G = \{\{S\}, \{a, b\}, P, S\}$ , where  $P$  is defined as  $S \rightarrow SbS|a$ , show that  $G$  is ambiguous by considering the string abababa using parse trees.

(2)

I got: ~  
16  
20



DEPARTMENT OF COMPUTER SCIENCE  
B.Tech SIXTH SEMESTER (CSE)  
Class Test- I (7.2.19)  
CSX-306 SYSTEM PROGRAMMING

Time Allowed: 1 hr

MM-20

**This Question Paper Consists of 5 Questions and 1 Page**

Note: Attempt all Questions. Be brief and to the points in writing answers.

- Q.1 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. Give the values of Data Structures after Pass 1 ; intermediate code (IC) and machine code. (8)

```
START 100
READ N
MOVER B, = '1'
MOVEM B, TERM
A MUL B, TERM
LTORG
MOVER C, = '2'
MOVEM B, = '5'
LTORG
N DS 1
TERM DS 1
END
```

- Q.2 Consider the following code and answer the following (4)

```
MACRO
XYZ &A
ST 1, &A
MEND
MACRO
AR 4, &W
XYZ ALL
MEND
ALL DC F'3'
END
```

- Expand the macro into assembly program
- Design MDT table Macro Processing
- Design MNT table after Processing

- Q3. Give the example to explain how the model statements are used to perform the action of storing contents of the CPU register into different areas of memory. (2)

- Q.4 A language processor is to be designed to handle programs containing upto 500 symbols. However it is found that an average program contains about 200 symbols. It is decided that a hash organization with sequential rehashing must be used. Evaluate the design alternatives in terms of memory requirement and access efficiency considering size of table having 550 and 700 entries. (4)

- Q.5 Explain the role of Language Processors in terms of application and execution domains. (2)

**Dr B R Ambedkar National Institute of Technology,  
Jalandhar**

**B Tech (Computer Science & Engineering)  
CSX-306 System Programming  
Minor -II Examination**

Duration: 1 Hour

Max. Marks: 20

Date: 28<sup>th</sup> March 2019

**Note:**

1. Attempt all the questions

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

CO: Course Outcome ; DL: Difficulty Level.

Q1. Discuss in brief the major advantages and disadvantages of absolute loaders. (3)

Q2. Show the traces of execution of algorithm for relocation of programs by taking suitable example (3)

Q3. Show the traces of execution of algorithm for program linking by taking suitable example. (3)

Q4. Consider the following grammar for arithmetic expressions.

$<\text{exp}>$	$::=$	$<\text{exp}> + <\text{term}> \mid <\text{term}>$
$<\text{term}>$	$::=$	$<\text{term}> * <\text{factor}> \mid <\text{factor}>$
$<\text{factor}>$	$::=$	$<\text{factor}> \uparrow <\text{primary}> \mid <\text{primary}>$
$<\text{primary}>$	$::=$	$<\text{id}> \mid <\text{const}> \mid (<\text{exp}>)$
$<\text{id}>$	$::=$	$<\text{letter}> \mid <\text{id}> <\text{letter}> \mid <\text{id}> <\text{digit}>$
$<\text{const}>$	$::=$	$[ + - ] <\text{digit}> \mid <\text{const}> <\text{digit}>$

$\langle \text{letter} \rangle ::= \text{a } \text{b } \text{c } \text{l } \dots \text{z}$   
 $\langle \text{digit} \rangle ::= 0 1 1 1 2 1 3 1 4 1 5 1 6 1 7 1 8 1 9$

Show the reduction of  $a+b*c$  the ambiguity in grammar should be eliminated, If any. (3)

Q5. Show the sequence of prediction made by the following LL(1) parser table for the source string  
 $| - < \text{id} > + < \text{id} > * < \text{id} > |$

Non-Terminal	Source symbol			
	$< \text{id} >$	$+$	$*$	$-$
E	$E \Rightarrow T E'$			
$E'$		$E' \Rightarrow + T E'$		$E' \Rightarrow \epsilon$
T	$T \Rightarrow V T'$			
$T'$		$T' \Rightarrow \epsilon$	$T' \Rightarrow * V T'$	$T' \Rightarrow \epsilon$
V	$V \Rightarrow < \text{id} >$			

(3)

Q6. Show the memory allocation for the following program segment considering that it is an accessing an element of an array with dynamic bounds

Var

$x, y : \text{real};$   
 $\alpha : \text{array } [l\_1 : u\_1, l\_2 : u\_2] \text{ of integer};$   
 $i, j : \text{integer};$

begin

$\alpha[i, j] := \dots;$

where  $l\_1, l\_2, u\_1$  and  $u\_2$  are nonlocal variables (3)

Q7. Discuss in brief the major issue in the code generation for expressions. (2)

16110023

DR B R AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY,  
JALANDHAR  
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING  
B. Tech Sixth Semester(CS)  
Mid Semester Examination I ( 08.2.2019 )  
CSX- 308 COMPUTER GRAPHICS AND ANIMATION

Duration: 1 Hr.

Max. Marks: 20

This Question Paper consists of 5 Questions and 1 Page

Note: Attempt all Questions. Be brief and to the point in writing answers.

- Q1. a) Explain basic refresh operations of video controller in raster graphics system?  
b) Find out the aspect ratio of a raster system using 8 X 10 inches screen and 100 pixels per inch. [2+1=3]

- Q2. a) Compute the intermediate points on the line drawn from (35,40) to (43,45) using Bresenham's algorithm.  
b) Discuss the limitations of DDA algorithm. [3+1=4]

- Q3. a) Explain the technique which is used for producing colors in CRT monitors in random scan systems?  
b) List three differences between boundary fill algorithm and flood fill algorithm. [2+2=4]

- Q4. a) Using mid point circle drawing algorithm find out the screen co-ordinates of the circumference of circle centered at origin and radius is 5 units.  
b) Rotate the given triangle A(1,0), B(0,1) and C(1,1) by 45 degree in anticlockwise direction followed by translation in the direction of vector(1,0). Find out the new co-ordinates of given triangle. [2.5+2.5=5]

- Q5. a) Explain Mid point ellipse generation algorithm in detail. [4]

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Dr B R Ambedkar National Institute of Technology, Jalandhar

B Tech (CSE)

CSX- 308 Computer Graphics and Animation

Minor II - Examination

Duration: 1 Hour

Max. Marks: 20

Date: 29<sup>th</sup> March 2019

Note:

1. Attempt all the questions. Mention assumptions if any
2. This question paper consists of 8 questions and 2 pages.

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

CO: Course Outcome; DL: Difficulty Level.

1. A line with endpoints (4,6) and (10,10) is to be rotated about its midpoint by an angle of 45 degree clockwise. Find out the coordinates of the endpoints after rotation. [3]
2. Prove that any two successive rotations about a given rotation axis is commutative. [1.5]
3. Find the transformation matrix that will map points contained in window with lower left corner at(2,2) and upper right corner at (6,5) onto a normalized viewport that has lower left corner(0,0) and upper right corner(1,1). [2.5]
4. Reflect the diamond shaped polygon whose vertices are A(-1,0), B(0,-2),C(1,0)and D(0,2) about the line  $y=x+2$ . [2.5]
5. Explain Cohen Sutherland line clipping algorithm in detail with example. [3]



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

**Duration: 1 Hr.**

**Max. Marks: 20**

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

1. a) How tables are created in HTML? What are the various tags used during table? [2]
- b) What Can JavaScript do? [2]
2. a) Difference between div and span in html with an example and syntax? [2]
- b) Explain with an example about cellpadding and cellspacing attributes? [3]
3. a) Write a note on XML elements and XML attributes. [2]
- b) What is DTD? How is it different from XML? [2]
4. What is parsers? Distinguish between tree based parsers and event based parsers? [3]
5. Explain DOM architecture? [4]

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Dr B R AMBEDKAR NATIONAL INSTITUTE OF TECHNOLOGY, JALANDHAR  
DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

B.Tech 6th SEMESTER

Minor II Examination (A Y Jan-June 2019)

CSX-310 Web Technologies

Duration: 1 Hr.

Max. Marks: 20

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

Mapping of questions with Course Outcomes							
Q. No.	1a	1b	2	3	4	5	
CO No.	CO1	CO2	CO3	CO2	CO4	CO4	
DL	1	1	2	1	3	3	

CO: Course Outcome; DL: Difficulty Level

- 1 a. What is Java Bean and write the advantages of Java Beans? (2)
- b. What is BDK? Explain the steps involved in BDK tool? (2)
- 2 Explain Session bean Persistence in EJB? (4)
- 3 What is the two level security that client must pass in EJB? (4)
- 4 Explain about EJB Architecture? (4)
- 5 Explain the life cycle of servlet? (4)



DR B R AMBEDKAR NATIONAL INSTITUTE OF  
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
B. Tech 6<sup>th</sup> Semester  
MINOR- 1 (09.02.2019)  
CSX- 332 ADVANCED OPERATING SYSTEM

16/11/0023

Duration: 1 Hr.

Max. Marks: 20

*This Question Paper consists of 4 Questions and 1 Page*

Note: Attempt all Questions. Be brief and to the point in writing answers.

Q1a) Consider a bank database which is fully replicated. Give an algorithm/protocol for ordering of transactions.

b) Why global clock is important in distributed systems? [3+2=5]

Q2a) How does monitor works in process synchronization? Give the syntax of monitor.

b) Is it possible to have a deadlock situation in system involving one process? [3+2=5]

Q3a) At a particular time of computation the value of a counting semaphore is 7. Then 20 P operations and x V operations were completed on this semaphore. If the new value of semaphore is 5, compute the value of x.

b) List some of the issues in distributed operating systems. [3+2=5]

Q4 a) Explain the different classical synchronization problems.

b) What is causal ordering in distributed systems? [3+2=5]

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Dr B R Ambedkar National Institute of Technology, Jalandhar  
B Tech 6<sup>th</sup> (CSE)

CSX- 332 Advance Operating Systems  
Minor II - Examination

Duration: 1 Hour Max. Marks: 20 Date: 30<sup>th</sup> March 2019

Note:

1. Attempt all the questions

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

CO: Course Outcome; DL: Difficulty Level.

Q1. Explain the Chandy- Lamport's global state recording algorithm. 5

Q2. Describe the implementation rules for the vector clocks.  
— Explain with an example. 5

Q3. a) Compare the performance of token based and non-token based algorithms in mutual exclusion  
b) Discuss the impact of message loss on the various deadlock detection algorithms. [3+2=5]

Q4. a) Explain the architecture of SUN Network File System.  
b) What are the important goals of distributed systems?

[3+2=5]  
file



## Mid-Semester Examination-1

Duration: 1 Hour (02:30pm to 3:30pm; February 09, 2019)

Max.Marks: 20

Teacher: Dr. Rakesh K. Sharma, Asso. Prof., Industrial and Production Engineering Department

### NOTE:

1. Answer all the four questions carrying 05 marks each.
2. Students are expected to make use of neat illustrations, comparison-tables, flow-charts, graphs or diagrams wherever possible.
3. Answer crisply. Avoid being obscure and verbose while writing answers.

1. How the distinction of goods as substitutes and complements help in business decision making? If the price of milk increases, what do you think will happen to its demand? What do you expect to happen to the demand of Corn-Flakes?
2. What is the accumulated value of a Rs.25000/-payment to be made at the end of each of the next three years if the prevailing rate of interest is 9% computed annually? Draw cash flow diagram also.
3. Answer the following:
  - a. Name any three qualitative methods for delivering a consensus forecast.
  - b. As an operations manager how would you forecast the demand for next period; by one of the above methods or by using some quantitative models? Give an appropriate argument in favour of your answer (one-line answer only).
  - c. What shortcoming of the averaging time series models are eliminated by the use of a weighted average model?
  - d. Comment about the value of Bias in the case of demand forecasting for a product using simple average method if it's demand is continuously increasing.
4. Draw a flowchart showing how "Make or Outsource" decision is taken in an Industrial organisation. Give example of a situation when a decision recommended by using quantitative techniques is rejected after the final analysis due to some qualitative factors.

Note:

1. Attempt all the questions
2. Draw flowcharts, diagrams neatly.

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

CO: Course Outcome; DL: Difficulty Level.

1. A firm pays Rs. 10,000/- for purchasing an equipment. The operating and maintenance cost of the equipment is Rs.2,500/- per year for the first two years and then it goes up by approximately Rs. 1,500/- per year. Find out the optimum length of time to hold the machine before replacing it? Take discount rate as 10% per year. 5
2. (a) What is the difference between scheduled and preventive maintenance?  
(b) Give an example of a situation when economic life of an asset is suddenly shortened.  
(b) Why is safety stock maintained?  
(c) Can scrap value be negative? Give example to support your answer. 2, 1, 1, 1
3. A pick-up truck was purchased by a bread supplier for its operations for Rs. 2,00,000/-. As per government rules concerning pollution norms, its life span was 10 years. It carries a salvage value of Rs. 50,000/- at the end of its permissible life. Calculate the depreciation ratio (in %age), using the diminishing balance method. How much

depreciation fund, the bread supplier need to maintain at the end of  
two years? 5

4. A manufacturer estimates to use Rs.1,00,000/- worth of an item during 2019-2020. The ordering cost is Rs. 250/- per order and the inventory carrying cost is 12.5% of average inventory value. Find the number of orders per year and the value of each consignment. Also evaluate the total optimal cost of inventory over the year. 5