DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination – Oct 2018

Course: B. Tech in Information Technology   Sem: III

Subject Name: Switching Theory and Logic Design   Subject Code: BTITC302

Max Marks: 20   Date: 09/10/2018   Duration:- 1 Hr.

Instructions to the Students:
1. Assume suitable data wherever necessary.

Marks

Q. 1   Select any one option from the following questions.   6

1. In Boolean algebra, the OR operation is performed by which properties?

a) Associative properties   b) Commutative properties

c) Distributive properties   d) All of the Mentioned

2. The octal number 645 in power of 8 is equal to

a) 450   b) 451   c) 421   d) 501

3. $(A + B)(A' * B') = ?$

a) 1   b) 0   c) AB   d) AB'

4. 1's complement can be easily obtained by using

a) Comparator   b) Inverter   c) Adder   d) Subtractor

5. The systematic reduction of logic circuits is accomplished by:

a) Symbolic reduction   b) TTL logic

c) Using Boolean algebra   d) Using a truth table

6. It should be kept in mind that don't care terms should be used along with the terms that are present in

a) Minterms   b) Maxterm   c) K-Map   d) Latches

Q.2   Solve Any Two of the following.   3 X 2

(A)   Perform the following subtractions using 2's complement method:

    a)   01100 – 00011

    b)   0011.1001 – 0001.1110

(B)   Minimize the following expression using K-Map.

f1(A,B,C,D)=Σm(1,3,5,8,9,11,15)+d(2,13)

(C)   Explain the operation of TTL NAND gate.

Q. 3   Solve Any One of the following.   8

(A)   Simplify the logic function using Quine McCluskey minimization technique.

Y(A,B,CD)= Σm(0,1,3,7,8,9,11,15)

(B)   Some 8-4-2-1 code words are transmitted in Hamming code with even parity checking. The following words are received:

a) 0101000   b) 0011101
c) 1100100   d) 1100110
e) 1110011   f) 1111001
g) 1101001   h) 1000010

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination – Oct 2018

Course: B. Tech in Information and Technology   Sem: III

Subject Name: Programming in JAVA   Subject Code: BTITOE305̶7̶8̶

Max Marks: 20   Date:-12/10/2018   Duration:- 1 Hr.

Instructions to the Students:
1. Assume suitable data wherever necessary.
2. All questions are compulsory.

	(Level/CO)	Marks
Q.1 Solve all questions. One mark for each question.		
1. Which access specifiers can be used for a class so that it's members can be accessed by a different class in the different package?	CO1	6
a. Private b. Public	CO1	
c. Protected d. None of the above		
2. What is the range of the int data type?	CO1	

a. –2,147,483,648 to 2,147,483,647   b. -2,147,483,647 to 2,147,483,648

c. -32,768 to 32,767   d. -32,767 to 32,768

3. Find the output   CO1

```
class Char {
public static void main(String args[]) {
char ch1, ch2;
ch1 = 88; // code for X
ch2 = 'Y';
System.out.print("ch1 and ch2: ");
System.out.println(ch1 + " " + ch2);
}
}
```

a. ch1 and ch2: X Y   b. ch1 and ch2: x y

c. ch1 and ch2: 1 3   d. None of the above

4. Which is the correct syntax to convert string to integer datatype   CO1

a. parseInt.Integer(variable);   b. int.parseint(variable);

c. Integer.parseInt(variable);   d. int.parseInteger(variable);

5. JVM stands for   CO1

a. java virtual module   b. java virtual machine

c. java variable machine   d. none of the above

6. What will be the output of following code   CO1

```
class Demo{
  int result=0;
  public static void main(String[] arg)  {
```

```
for( int x=0; x<5;x++) {
    if(x= =3)
        result += 10;
    else
        result += x;
    }
System.out.println(result);
}
}
```

a. 3   b. 13
c. 17   d. 10

Q.2   Solve Any Two of the following.   **3 X 2**

(A)   Write a Java program to trim any leading or trailing whitespace from a given string.   CO3

(B)   How the constructors are different from methods in java? Illustrate with example.   CO2

(C)   What is abstract method and total abstraction explain with example.   CO2

Q. 3   Solve Any One of the following.   **8 X 1**

(A)   Write a Java program to remove the duplicate elements of a given array and return   CO3
the new length of the array.

Sample array: [20, 20, 30, 40, 50, 50, 50]

(B)   Create an application with applet to accept the integer from the input field and   CO3
display its square.

*** End ***

Course: S.Y. B. Tech.   Sem: 1

Subject : Engineering Mathematics-III   Subject Code:BTBS301

Max. Marks: 20   Date: 08.10.2018   Duration: 1 Hr.

Instructions: 1. All question are compulsory.
             2. Use of nonprogrammable calculator is allowed.
             3. Figures to right indicate full marks.

Q1. Attempt the following.   (6)

a) $L\left[\dfrac{f(t)}{t}\right] = \ldots\ldots\ldots$

   i) $\dfrac{1}{s}\bar{f}(s)$ ii) $-\dfrac{d}{ds}\bar{f}(s)$ iii) $\int_s^\infty \bar{f}(s)ds$ iv) none of these

b) The Fourier sine transform of $\dfrac{1}{x}$ is

   i) $\dfrac{s}{2}$ ii) $\dfrac{s^2}{2}$ iii) $\dfrac{s^2}{3}$ iv) none of these

c) $L[t^2] = ---$

   i) $\dfrac{1}{s}$ ii) $\dfrac{2}{s^2}$ iii) $\dfrac{2}{s^3}$ iv) $\dfrac{1}{s^3}$

d) Inverse Laplace Transform of $\dfrac{1}{(s^2+36)}$

   i) $\dfrac{1}{2}sin6t$ ii) $cos6t$ iii) $\dfrac{1}{5}(sin6t + cos6t)$ iv) $\dfrac{1}{6}sin6t$

e) Inverse Laplace Transform of $\dfrac{2}{3s+1}$

   i) $\dfrac{2}{3}e^{-s}$ ii) $\dfrac{2}{3}e^{-t}$ iii) $\dfrac{2}{3}e^{-\frac{t}{3}}$ iv) $\dfrac{2}{3}e^{-4t}$

f) Find $L[(t-1)^2 . H(t-1)]$

   i) $\dfrac{12e^{-s}}{s^3}$ ii) $\dfrac{2e^{-s}}{s^3}$ iii) $\dfrac{2e^{-s}}{s}$ iv) none of these

Q2. Attempt any Two of the following.   (6)

(A) Express $f(t) = \begin{cases} sint , & 0 < t < \pi \\ sin2t , & t > \pi \end{cases}$

   into Heaviside unit step function & find it's Laplace transform .

(B) Find Inverse Laplace Transform of $\dfrac{3s+2}{s^2+s+1}$

(C) Find Fourier sine transform of $f(x) = 2e^{-4x} + 4e^{-2x}$

Q3. Attempt the following.

(8)

(A) Find Inverse Laplace Transform of $\dfrac{S}{(S-2)(S^2+1)}$ by convolution theorem

(B) Evaluate $\displaystyle\int_0^\infty e^{-4t}\left[\dfrac{\cos 6t - \cos 4t}{t}\right]dt$

OR

(A) Solve: $\dfrac{dx}{dt} = 2x - 3y, \dfrac{dy}{dt} = y - 2x, x(0) = 8, y(0) = 3$ *by Laplace transform*

(B) Show that $\displaystyle\int_0^\infty \dfrac{\cos\lambda x}{1+\lambda^2}\,d\lambda = \dfrac{\pi}{2}e^{-x}$, $x \geq 0$

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Mid Semester Examination – Oct 2018

Course: B. Tech in IT   Sem: III

Subject Name: <u>Computer Architecture and Organization</u>

Subject Code: BTCOC304

Max Marks: 20   Date:-   Duration:- 1 Hr.

Instructions to the Students:
1. Read question carefully and write complete answers.

	(Level/CO)	Marks

Q. 1 Attempt following questions   **6**

1. The communication between the components in a microcomputer takes place via the   1
address and ....

2. The memory unit that communicates directly with the CPU is called   1

3. A bus that connects major computer components (processor, memory, I/O) is called?   1

    A) System bus B) address bus C) data bus   D) control bus

4. A computer with a 32-bit word size uses 2's complement to represent numbers. The   3
    range of integers that can be represented by this computer is

A) - 2^{32} to 2^{32} B) - 2^{31} to 2^{31} C) - 2^{31} to 2^{31}-1   D) - 2^{32} to 2^{31}

5. A collection of lines that connects several devices is called   1

A) Bus   B) peripheral connection wires   C) Both a and b   D) internal wires

6. An exception condition in a computer system caused by an event external to the CPU is   1
    called ....

A) Interrupt   B) Halt   C) Wait   D) Process

Q.2 **Solve Any Two of the following.**   **3 X 2**

(A) Describe fixed- point and floating-point representation.   3

(B) Explain functionality of top-level components of Computer.   1

(C) List different addressing modes and describe any two with suitable examples.   2

Q. 3 **Solve Any One of the following.**   **8**

(A) Write two and three address instructions to execute Y= (A-B) / (C + (D x E))   2

(B) Describe different types of operands with examples and general types of operations   2
found on all machines.

*** End ***

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE
Mid Semester Examination – Oct 2018

Course: S.Y.B.Tech(CSE)	Sem: I
Subject Name: Discrete Mathematics	Subject Code: BTCOC302
Max Marks: 20 Date:- 09/10/2018	Duration:- 1 Hr.

Instructions to the Students:
1. Check that you have received a correct Question paper.
2. Assume suitable data if necessary and mention it clearly
3. Draw NEAT labeled diagrams wherever necessary

Q.1. Attempt any **six Questions**   (1*6 = 6 Marks)

1. Given A= {1, 3, 6, 8, 9, 12, 15} and B= {6, 9, 12}, which of the following is true?
   (a) B is complement of A   (b) B intersection A = NULL
   (c) A and B are disjoint sets   (d) B ⊂ A
2. What is Universal Quantifier?
3. Determine the power set P (A) of A = {a, b, c, d}.
4. Let A = {1, 2, 3}, B = {a, b, c}, and C = {x, y, z}. Consider the following relations R and S from A to B and from B to C, respectively.
   R = {(1, b), (2, a), (2, c)} and S = {(a, y), (b, x), (c, y), (c, z)}
   Find the composition relation $R \circ S$.
5. What is a Homogeneous solution?
6. Range of a function is
   a. A maximal set of numbers of which a function is defined
   b. The maximal set of numbers which a function can take values
   c. It is set of natural numbers for which a function is defined
   d. None of the above
7. A store has T-shirts in 6 different styles and 4 different sizes. How many different kinds of T-shirts does the store have?
   (a) 10   (b) 24   (c) 16   (d) 36
8. Define Equivalence relation.

Q. 2. Attempt any **two** of the following   (2*3 =6 Marks)

A. Let X = {1, 2, 3, 4}. Determine with justification, whether each relation given below on X is a function from X into X.
   (a) f = {(2, 3), (1, 4), (2, 1), (3.2), (4, 4)}
   (b) g = {(3, 1), (4, 2), (1, 1)}
   (c) h = {(2, 1), (3, 4), (1, 4), (2, 1), (4, 4)}
B. How many strings of 8 English letters are there?
   (i) if letters can be repeated   (ii) if no letter can be repeated?
C. State and prove DeMorgan's laws.

Q.3. Attempt any **one** of the following   (1* 8 = 8 Marks)

A. Define and explain with suitable example:
   (i) Ordered set   (ii) Union of sets
   (iii) Symmetric difference   (iv) Relative complement
B. Show that:
   $1^2 + 3^2 + 5^2 + \ldots + (2n-1)^2 = (n (2n-1)(2n+1))/3$ by method of induction

END

Q.1 Answer the following questions: (6-Marks)

1. Perform Binary Subtraction on $1100.10 - 111.01$

2. Convert $(2AB)_{16} = (?)_8$

3. Draw the structure of 4-variable K-map.

4. Draw the symbol & truth table for SR-FF.

5. Write Excitation table for D-FF

6. Define shift register & its types.

Q.2 Solve any TWO of the following (6-Marks)

A) Design 4 input NAND gate by using 2 input NAND gates.

B) Reduce the following expressions using K-map and implement them in universal logic:

$$F(A,B,C) = \sum m(2,3,4,5)$$

C) Realize the logic expression given below using 4:1 MUX

$$F = \sum m (0, 2, 4, 7)$$

Q.3 Solve any ONE of the following (8-Marks)

A) What do you mean by universal gates ? Why these gates are called as universal gates.

B) Design 2-bit synchronous counter using T-FF.

**** END ****

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE	
Mid Semester Examination – Oct 2018 **Course: B. Tech in Computer Science and Engineering Sem: III** **Subject Name: Data Structure Subject Code: BTCOC303** **Max Marks: 20 Date:-10/10/18 Duration:- 1 Hr.**	40 40 27

Instructions to the Students:
1. Please check whether you have got the right question paper
2. Assume suitable data if necessary.

		Marks
Q. 1	**Attempt the following questions:**	6
	1. Array elements are always stored in_____ memory locations. a) Sequential c) Sequential and random b) Random d) None of the above	
	2. The worst case occur in linear search algorithm when .... A. Item is somewhere in the middle of the array B. Item is not in the array at all C. Item is the last element in the array D. Item is the last element in the array or item is not there at all	
	3. Which of the following is not the required condition for binary search algorithm? A. The list must be sorted B. There should be the direct access to the middle element in any sub list C. There must be mechanism to delete and/or insert elements in list. D. Number values should only be present	
	4. If several elements are competing for the same bucket in the hash table, what is it called? a) Diffusion b) Replication c) Collision d) None of the mentioned	
	5. What can be the techniques to avoid collision? a) Make the hash function appear random b) Use the chaining method c) Use uniform hashing d) All of the mentioned	
	6. Which of the following is not a part of ADT description? a) Data c) Both of the above b) Operations d) None of the above	
Q.2	**Solve Any Two of the following.**	3 *2
(A)	Write the algorithm for finding transpose of sparse matrix.	
(B)	Explain Abstract data type.	
(C)	What are asymptotic notations? Explain them in detail.	
Q. 3	**Solve Any One of the following.**	8
(A)	Explain how operations like insertion & deletion are performed in a skip list.	
(B)	Explain insertion sort with example and algorithm.	
	*** End ***	

Course: B. Tech in Information Technology   Sem: III

Subject Name: Object Oriented Paradigm with C++   Subject Code: BTIT C303

Max Marks: 20   Date:- 10/10/18   Duration:- 1 Hr.

Instructions to the Students:
1. All questions are compulsory.
2. Assume suitable data whenever necessary.

(Level/CO)   Marks

Q. 1 Solve all questions. (one mark for each question)   6

1. _____ means determining at runtime what method to invoke?   CO3

   a) data hiding   b) dynamic typing   c) dynamic binding   d) dynamic loading

2. _____ private members functions are allowed in class?   CO3

   a) Only 1   b) Only 7   c) only 255   d) As many as required

3. The member functions, if defined outside the class must use _____ operator.   CO3

   a)Extractor   b) dot   c)scope resolution d) none

4. A class contains _____ and methods that operate on these.   CO2

   a) Struct variables b) objects c) data members   d) integers

5. The class members, by default are _____.   CO2

   a) public b) Private   c) protected d) all of the above

6. The _____ determines the order of evaluation of an expression.   CO3

   a) Overlay b) Precedence c)descending d) ascending

Q.2 Solve Any Two of the following. (Three mark for each question)   3 X 2

(A) Write a program to calculate area of triangle and circle using function overloading.   CO3

(B) Design a class which will accept and display information of five employees working in   CO3
organization. Information of employee includes name, employee id and age.

(C) Illustrate the concept of object Oriented system development.   CO2

Q. 3 Solve Any One of the following. (Eight mark for each question)   8

(A) Create a constructor complex which will calculate sum of two real numbers and two   CO5
imagery numbers. Also Write a display ( ) function which will print complex number in
a form 2+j3.

(B) Demonstrate how constructor takes a reference to an object of the same class as itself as   CO5
an argument (copy constructor) by writing a suitable program.

*** End ***