SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)

(Established under section 3 of the UGC Act 1956)
Re-accredited by NAAC with 'A' Grade

Seat No. | | | | | | |

titute: (0701)SYMBIOSIS INSTITUTE OF TECHNOLOGY, PUNE

ogramme: (070121) BACHELOR OF TECHNOLOGY
Computer Science and Engineering, Information Technology

tch: 2012-16,2013-17

mester: III

urse: Industrial Management

urse Code: 0701210306CS, 0701210306IT

ESE
CS - 2016 - April
Sem- III

te: 29/04/2018

y: Sunday

Maximum Marks: 45

Time: 12:00Noon-01:30 pm

Instructions:

1. **All questions in 'PART A' are compulsory**
2. **Answer any two questions from Q.2 to Q. 4 in 'PART B'**
3. **Draw neat diagrams wherever necessary**

PART A

Q. 1	**a)**	What is quality control? Describe in detail.	**5**
	b)	What is a balance sheet and describe its contents?	**5**
	c)	Explain the concept of globalization.	**5**

PART B

Q. 2	**a)**	Describe in detail the infrastructure in a Tri-Management Level of an IT Organization.	**7**
	b)	How to assess the Skill Levels of Current Onboard Staff?	**8**
Q.3	**a)**	Describe the Approaches of financial management profit maximization, wealth maximization and its limitations.	**7**
	b)	What are the cardinal sins that undermine good customer service?	**8**
Q.4	**a)**	What is the difference between manufacturing and service organization?	**7**
	b)	Explain Juran's and Demings view of quality.	**8**

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SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)

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Re-accredited by NAAC with 'A' Grade (3.58/4) Awarded Category – I by UGC

Seat No. | | | | | | |

Institute: (0701)SYMBIOSIS INSTITUTE OF TECHNOLOGY, PUNE

Programme: (070121) BACHELOR OF TECHNOLOGY
Computer Science and Engineering, Information Technology

Batch: 2014-18,2015-19,2016-20

Semester: III

Course: Digital Electronics & Logic Design

Course Code: 0701220305CS, 0701240305IT

Date: 21/05/2018 **Maximum Marks:** 60

Day: Monday **Time:** 09:45 am - 12:15 pm

Instructions:

1. **All questions are compulsory.**
2. **Draw neat diagrams wherever necessary.**
3. **Use of non-programmable calculators is allowed.**
4. **Make suitable assumptions wherever required.**

Q.1 **Solve any Three.**

a. Solve the equation using k –map 5
F(A,B,C,D)=(A+B+C'+D').(A'+C+D').(A'+B+C'+D').(B'+C).(B'+C')(A+B').
(B'+D') and realize it using NAND gates only.

b. Which logic gates are known as universal gates? Realize all the basic gates and special gates using any one universal gate. 5

c. What are different ways of representing signed binary numbers? Explain with examples. 5

d. Simplify the given expression using Boolean laws. Also mention the name of the laws. 5
$Y = (A + B + \bar{C})(A + \bar{B} + \bar{C})(\bar{A} + B + \bar{C})(\bar{A} + \bar{B} + \bar{C})$

Q.2 Define Propagation delay, power dissipation and noise margin. 6

Q.3 Perform the following. 5

1. $(D8A)_{16}$ - $(426)_{16}$ = ($)_{16}$ Hexadecimal subtraction using16's complement.
2. $(777)_{10}$ + $(246)_{10}$ =($)_{10}$ BCD addition.
3. $(541)_{10}$ - $(216)_{10}$ = ($)_{10}$ BCD subtraction using 10's complement.

Q.4	**a.**	Design and explain two bit magnitude comparator using 1:16 demultiplexer.	**5**
	b.	Design full subtractor using half subtractor along with truth table and K-map. Also show that expression obtained with K-map and digital circuit diagram is equal.	**5**
Q.5	**a.**	Draw and explain the circuit diagram of 5-bit SISO shift register. Show the timing diagram for specified data input 10101. Assume register initially clear all (0s). Also write advantages and disadvantages of SISO shift register.	**7**
	b.	Explain SR flip flop with preset and clear input. Also draw the truth table. What is the major drawback of SR flip flop?	**5**
	c.	Differentiate sequential circuit and combinational circuits.	**3**
Q.6		Draw and explain ASM chart for a 2-bit up/down counter with the mode control input M. For M=1 it acts as up counter otherwise down counter.	**5**
Q.7		Explain the internal architecture of a PLA.	**4**

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rogramme: (070121) BACHELOR OF TECHNOLOGY
Computer Science and Engineering

atch: 2012-16,2013-17,2014-18,2015-19,2016-20

emester: III

ourse: Programming Paradigms

ourse Code: 0701220302CS

ate: 14/05/2018 Maximum Marks: 45

ay: Monday Time: 01:30 pm - 03:00 pm

Instructions:

1. **All are compulsory.**
2. **Draw neat diagrams wherever required.**

Q.1 **a)** Distinguish between Object and Procedure Oriented Programming. **3**

b) List and explain various programing paradigms. **3**

Q.2 **a)** Identify the error and write the correct code for following snippet: **2**

```
#include<iostream.h>
#include<String>
using namespace std;
void main(){
    string str1('ghi');
    string str2('abc'+'def');
    str2+=str1;
    cout<<str2;
}
```

b) Describe various stages involved in C++ program compilation and execution with the help of flow chart. **3**

Q.3	**a)**	Write and explain a C++ program that illustrates the usage of friend function.	3
	b)	Define manipulator. List any four in-built manipulators.	2
	c)	Define Destructor in C++. Write a C++ program that demonstrates use of a parameterized constructor in derived classes.	5
Q.4	**a)**	Consider a book shop which sells both books and video tapes. Create a class media that stores the title and price of a publication. Derive two classes from media, one for storing the number of pages in a book and another for storing playing time of a tape. Write a C++ program using run time polymorphism to implement it.	6
	b)	How do the properties of following two derived classes differ?	3
		i. class D1: private B{//...};	
		ii. class D2: public B{//...};	
	c)	We know that a private members of a base class is not inherited. Is it any way possible for the object of a derived class to access the private member of the base class? If yes, how? Remember, the base class cannot be modified.	3
Q.5	**a)**	Explain the backtracking in Prolog with the help of example.	3
	b)	Explain Depth First Search with the help of example.	3
Q.6		Discuss the various features of Python. Write a Python program to find the sum of digits using recursion.	6

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Programme: (070121) BACHELOR OF TECHNOLOGY
Computer Science and Engineering,Information Technology

Batch: 2012-16,2013-17,2014-18

Semester: III

Course: Digital Electronics & Logic Circuits

Course Code: 0701210305CS,0701210305IT

Date: 21/05/2018 **Maximum Marks:** 60

Day: Monday **Time:** 09:45 am - 12:15 pm

Instructions:

1. **All questions are compulsory.**
2. **Draw neat diagrams wherever necessary.**
3. **Use of non-programmable calculators is allowed.**
4. **Make suitable assumptions wherever required.**

1 **Solve any Three.**

a. Solve the equation using k –map 5
F(A,B,C,D)=(A+B+C'+D').(A'+C+D').(A'+B+C'+D').(B'+C).(B'+C')(A+B').
(B'+D') and realize it using NAND gates only.

b. Which logic gates are known as universal gates? Realize all the basic gates and special gates using any one universal gate. 5

c. What are different ways of representing signed binary numbers? Explain with examples. 5

d. Simplify the given expression using Boolean laws. Also mention the name of the laws. 5
$Y = (A + B + \bar{C})(A + \bar{B} + \bar{C})(\bar{A} + B + \bar{C})(\bar{A} + \bar{B} + \bar{C})$

Define Propagation delay, power dissipation and noise margin. 6

Perform the following. 5
1. $(D8A)_{16}$ - $(426)_{16}$ = ( )$_{16}$ Hexadecimal subtraction using16's complement.
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	b.	Design full subtractor using half subtractor along with truth table and K-map. Also show that expression obtained with K-map and digital circuit diagram is equal.	5
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Q.7		Explain the internal architecture of a PLA.	4

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rogramme: (070121) BACHELOR OF TECHNOLOGY
Computer Science and Engineering, Information Technology

atch: 2012-16,2013-17,2014-18,2015-19,2016-20

emester: III

ourse: Discrete Structures

ourse Code: 0701220301CS, 0701240301IT

ate: 20/05/2018 **Maximum Marks: 60**

ay: Sunday **Time: 01:30 pm - 04:00 pm**

Instructions:

Draw neat labeled diagrams wherever necessary.
All questions are compulsory.

Q.1 **a.** Describe the concept of conditional and biconditional statements with the help of a physical situation. **2**

b. Show that the conditional statement **4**
$(p \vee q) \wedge (\neg p \vee r) \rightarrow (q \vee r)$ is a tautology using logical equivalence laws. (Mention the names of the equivalence laws used in each step).

c. What are the negations of the statements **2**
i) "There is an honest politician"
ii) "All Americans eat cheeseburgers"
(Represent the statements as logical expressions. Find negations of those logical expressions.)

d. What rule of inference is used in each of these arguments? **2**
i) Kangaroos live in Australia and are marsupials. Therefore, kangaroos are marsupials.
ii) If I work all night on this homework, then I can answer all the exercises. If I answer all the exercises, I will understand the material. Therefore, if I work all night on this homework, then I will understand the material.

Q.2 **a.** Explain the concept of rule of product and rule of sum with examples. **2**

b. What is the number of ways in which one can make up strings of four distinct letters followed by three distinct digits? **2**

c. What is the number of ways to choose three out of seven days (with repetitions allowed)? **2**

d. In how many ways can a prize winner choose three CDs from the top ten list if repeats are allowed? **2**

e. Consider the experiment of tossing a six-sided die twice and recording the sequence of numbers showing on the top face of the die after each toss. Determine the events described by each of the following statements. **2**
The sum of the numbers showing on the top faces is 8.
The sum of the numbers showing on the op faces is at least 10.

Q.3 **a.** List the ordered pairs in the relation R from A={0,1,2,3,4} to B={0,1,2,3} where (a,b) ∈ Rif and only if **2**

i) $a + b=4$
ii) $a \mid b$

b. Differentiate between chains and antichains with examples. **2**

c. If U is any set, then show that $(P(U),\subseteq)$ is a lattice. **2**

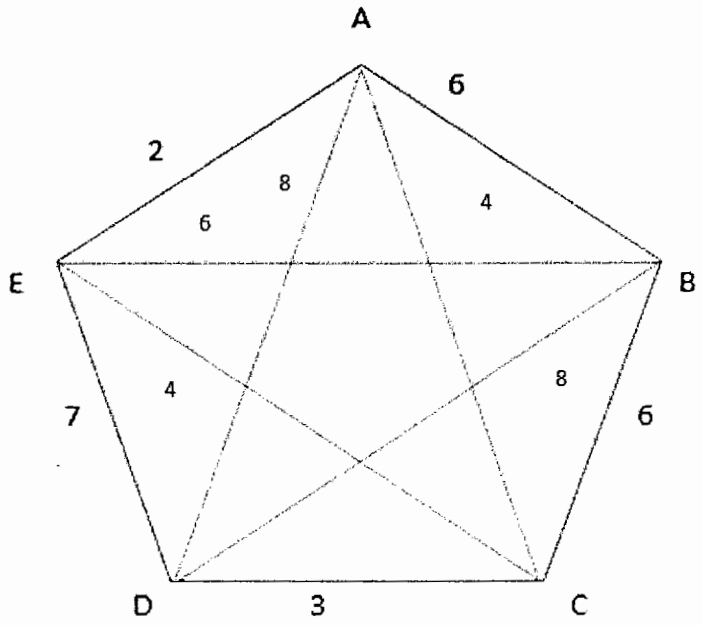
d. Let f be the function from R to R with $f(x) = x^2$. Is f invertible? Explain your answer. **2**

e. Determine whether the function $f(x) = x - 1$ from the set of integers to the set of integers is one to one. Explain your answer. **2**

Q.4 **a.** Prove the statement **5**
$1^1 + 3^2 + 5^2 + \cdots + (2n-1)^2 = \frac{1}{3}n(2n-1)(2n+1)$ is true by using mathematical induction.

b. A young pair of rabbits (one of each sex) is placed on an island. A pair of rabbits does not breed until they are two months old. After they are two months old, each pair of rabbits produces another pair each month. Find a recurrence relation for the number of pairs of rabbits on the island after n months, assuming that no rabbits ever die. **5**

Q.5 **a.** Use Kruskal's algorithm to find a minimum spanning tree for the given weighted graph. **6**



b. Describe the Job scheduling problem. **4**

Q. 6 **a.** Explain semigroup and monoids with examples. **4**

b. Differentiate between Isomorphism and automorphism. **2**

c. Define homomorphism. Give examples of two homomorphic mapping from one algebraic system to another. **4**

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ramme: (070121) BACHELOR OF TECHNOLOGY
Computer Science and Engineering

h: 2012-16,2013-17,2014-18,2015-19

ester: III

rse: Fundamentals of Data Structures

rse Code: 0701210303CS

: 18/05/2018

Friday

Maximum Marks: 60

Time: 01:30 pm - 04:00 pm

Instructions: 1) All questions in PART-A are compulsory.
2) Solve any 5 Questions in PART-B.

PART-A

Q.1 Solve following.

a) What is a queue? Explain its basic operations. 5

b) What is an actual and formal parameter in function explain with example? 5

c) Write difference between structure and union. 5

d) Explain continue and break statement in C Language. 5

PART-B

Q.2 Solve any 5.

a) What are applications of a queue? Explain different types of queues. 8

b) Explain 'Call by Value' and 'Call by Reference' parameter passing mechanism in function with an example of the C-program 'swapping of two numbers'. 8

c) Write a C-program for binary search. Show passes of bubble sort for following set of input. 8

50, 10, 30, 20, 40

d) What is collision? Explain different hashing techniques for collision resolution. 8

e) Write an algorithm to convert a Prefix expression to Infix expression. Convert following Prefix expression to Infix expression. **8**

+/+AB-CDE

f) Explain Recursive functions. Write C-program for factorial of a number using recursion. **8**

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ogramme: (070121) BACHELOR OF TECHNOLOGY
Computer Science and Engineering

tch: 2016-20

mester: III

urse: Fundamentals of Data Structures

urse Code: 0701220303CS

te: 18/05/2018 **Maximum Marks: 45**

y: Friday **Time: 01:30 pm - 03:00 pm**

Instructions:

1. **All questions are compulsory.**
2. **Neat diagrams must be drawn wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Make suitable assumptions wherever required.**

Q.1 a) What is a global and local variable explain with example? **4**

b) Explain recursion. Write C-program for factorial of a number using recursion. **6**

Q.2 a) What is Data Structure? Explain in detail. **4**

b) Write pseudocode for insertion sort. Apply insertion sort techniques for following set of input, show all passes. **6**

86, 6, 25, -2, 65, 95, -3, 9, 115, 15.

Q.3 a) Differentiate between circular queue and linear queue. **4**

b) Write 'C' program to implement following operations on a linear queue using arrays. **6**

i) Insert an element
ii) Delete an element
iii) Display queue contents
iv) Queue full
v) Queue empty

Q.4 a) Show steps to convert the following expression into postfix expression. **4**
(A + B * C — D) / (E * F)

b) How to efficiently implement k stacks in a single array? Write a program for the same. **6**

Q.5 Answer the following **5**

i) What are different file opening modes and their usage?
ii) What is difference between Text and Binary File?
iii) Which function is used to read and write a block of data?
iv) Write the command to move 20 bytes back from the end of the file.
v) Write the command to move 20 bytes back from the current position?

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rogramme: (070121) BACHELOR OF TECHNOLOGY
Computer Science and Engineering

atch: 2012-16,2013-17,2014-18,2015-19,2016-20

emester: III

ourse: Computer Organization

ourse Code: 0701220304CS

ate: 16/05/2018 Maximum Marks: 60

ay: Wednesday Time: 01:30 pm - 04:00 pm

Instructions:

1. **All Questions are Compulsory.**
2. **Draw Diagram and State assumptions wherever necessary.**

Q1	**a.**	Draw a flowchart of restoring binary division. Perform 11 / 3	**6**
	b.	Represent $41.625_{(10)}$ in single precision floating point format.	**4**
	c.	Draw and explain single bus structure.	**4**
Q.2	**a.**	Draw and explain block diagram of 8086 microprocessor.	**8**
	b.	Enlist different addressing modes.	**4**
Q.3	**a.**	Write the control sequence for the following instruction considering single bus organization of the CPU: SUB (R3), R2 Where, R3 is source register and R2 is a destination Register.	**4**

OR

	a.	Draw and explain microinstruction format.	**4**
	b.	Justify and explain need for grouping of control signals.	**8**

Q.4 **a.** Main memory has 3 page frames and processor requires pages from virtual memory in following order: **5**

4 5 6 3 4 8 3 5 4 6 5 4

Show implementation of first in first out, least recently used and optimal Algorithm. Compare page faults.

b. Explain the following: **4**

1. PROM
2. EEPROM

c. With suitable diagram explain how mapping is performed in associative mapping cache organization. **5**

Q.5 **a.** Compare programmed I/O and interrupt driven I/O **4**

b. Explain working mechanism of mouse. **4**

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