



SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)

(Established under Section 3 of the UGC Act, 1956)
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: (070122) BACHELOR OF TECHNOLOGY (COMPUTER SCIENCE AND ENGINEERING)

Batch: 2017-21

Semester: III

Course: Computer Organization

Course Code: 0701220306

ESE

Date: 27/11/2018

CS - October - 2018

Maximum Marks: 45

Day: Tuesday

Sem - III

Time: 01:30 pm - 03:00 pm

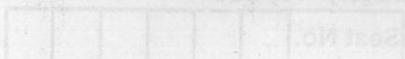
Instructions:

1. All questions are compulsory.
2. Make suitable assumptions wherever required.
3. Neat diagram must be drawn whenever necessary.

- | | | |
|-----|---|---|
| Q.1 | a) Outline evolution of computer. | 4 |
| | b) Demonstrate $17/3$ using Restoring algorithm for division. | 4 |
| Q.2 | a) Summarize instruction pipelining. | 6 |
| | b) Classify different types of registers in 8086 microprocessor. | 7 |
| Q.3 | Illustrate structure of micro-programmed control unit operations. | 4 |
| Q.4 | a) Main memory has 3 page frames and processor requires pages from virtual memory in following Order:
$\begin{array}{cccccccccccc} 7 & 2 & 4 & 6 & 4 & 5 & 5 & 3 & 4 & 2 & 3 & 4 \end{array}$ Show implementation of First-In First Out, Least Recently Used and Optimal algorithm. Compare page faults. | 6 |
| | b) Explain different types of ROM. | 3 |
| | c) With suitable diagram explain how mapping is performed in associated mapping cache organization. | 4 |
| Q.5 | a) Explain interrupt-driven I/O transfer technique. | 4 |
| | b) Demonstrate working mechanism of laser printer. | 3 |

ZAMBIA INTERNATIONAL COLLEGE UNIVERSITY

Registration Number 3 of the HCC Act 1962
Re-Registration by PAAO with A-G Series (3-PAAO) - 1 PA AGC



(ZIIC) ZAMBIA INSTITUTE OF TECHNOLOGY, RUMBE
(ZIIC) BACHELOR OF TECHNOLOGY (SCIENCE) SCIENCE AND ENGINEERING

2015-2016 Academic Year

Sessional Examination

Computer Communication

Computer Graphics

Computer Organization

Computer Programming

Computer Systems

Computer Theory

Database Management

Data Structures

Discrete Mathematics

Engineering Mathematics

Engineering Physics

Engineering Statics

Engineering Thermodynamics

Engineering Drawing

Engineering Mathematics II

Engineering Mathematics III

Engineering Mechanics

Engineering Materials

Engineering Mathematics IV

Engineering Mathematics V

Engineering Mathematics VI

Engineering Mathematics VII

Engineering Mathematics VIII

Engineering Mathematics IX

Engineering Mathematics X

Engineering Mathematics XI

Engineering Mathematics XII

Engineering Mathematics XIII

Engineering Mathematics XIV

Engineering Mathematics XV

Engineering Mathematics XVI

Engineering Mathematics XVII

Engineering Mathematics XVIII

Engineering Mathematics XVIX

Engineering Mathematics XX

Engineering Mathematics XXI

Engineering Mathematics XXII

Engineering Mathematics XXIII

Engineering Mathematics XXIV

Engineering Mathematics XXV

Engineering Mathematics XXVI

Engineering Mathematics XXVII

Engineering Mathematics XXVIII

Engineering Mathematics XXIX

Engineering Mathematics XXX

E23

CE - 00062 - 2018

III - M.2

maximum marks
100 - out of 100

of All questions are compulsory

To allow maximum marks, answer fully

to each question within the time allocated

Q1. Define Computer System and computer architecture.

Q2. Explain the various components of a computer system.

Q3. Explain the various components of a computer system.

Q4. Explain the various components of a computer system.

Q5. Explain the various components of a computer system.

Q6. Explain the various components of a computer system.

Q7. Explain the various components of a computer system.

Q8. Explain the various components of a computer system.

Q9. Explain the various components of a computer system.

Q10. Explain the various components of a computer system.

Q11. Explain the various components of a computer system.

Q12. Explain the various components of a computer system.

Q13. Explain the various components of a computer system.

Q14. Explain the various components of a computer system.

Q15. Explain the various components of a computer system.

Q16. Explain the various components of a computer system.

Q17. Explain the various components of a computer system.

Q18. Explain the various components of a computer system.

Q19. Explain the various components of a computer system.

Q20. Explain the various components of a computer system.

Q21. Explain the various components of a computer system.

Q22. Explain the various components of a computer system.

Q23. Explain the various components of a computer system.

Q24. Explain the various components of a computer system.

Q25. Explain the various components of a computer system.

Q26. Explain the various components of a computer system.

Q27. Explain the various components of a computer system.

Q28. Explain the various components of a computer system.

Q29. Explain the various components of a computer system.

Q30. Explain the various components of a computer system.

Seat No.						
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Institute: (0701)SYMBIOSIS INSTITUTE OF TECHNOLOGY, PUNE

Programme: (070122) BACHELOR OF TECHNOLOGY (COMPUTER SCIENCE AND ENGINEERING)

Batch: 2017-21

Semester: III

Course: Fundamentals of Data Structures

Course Code: 0701220304

Date: 20/11/2018

Maximum Marks: 60

Day: Tuesday

Time: 01:30 pm - 04:00 pm

Instructions:

1. All questions are compulsory.
2. Neat diagrams must be drawn wherever necessary.
3. Make suitable assumptions wherever required.

Q.1 a) What is call by value and call by reference in a function? Write a program to swap two numbers using call by value and call by reference. 6
 b) Define ADT. State and explain different types of data structure. 8

Q.2 a) Apply bubble sort techniques for following set of input, show all the passes. 6
 7, 5, 2, 4, 10, 1, 6, 3
 b) Write function code for merge sort. State its time complexity. 8

Q.3 a) Explain concept of multistack with example. 4
 b) Write an pseudocode to convert infix expression to prefix. Apply it to convert following infix expression to prefix. 8

$$((a b - (c + d / e ^ f) - g) h)$$

Q.4 a) What is double ended queue? Explain in brief.

- b)** Write 'C' program to implement following operations on a linear queue using arrays 8
- i) Insert an element
 - ii) Delete an element
 - iii) Display queue contents
 - iv) Queue full
 - v) Queue empty

Q.5 Explain different file opening modes with respect to text and binary file. 6

OR

Q.5 What is hashing? Explain different hashing techniques. 6



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Institute: (0701)SYMBIOSIS INSTITUTE OF TECHNOLOGY, PUNE

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

Batch: 2016-20

Semester: III

Course: Fundamentals of Data Structures

Course Code: 0701220303CS

Date: 20/11/2018

Maximum Marks: 45

Day: Tuesday

Time: 01:30 pm - 03:00 pm

Instructions:

1. All questions are compulsory.
2. Neat diagrams must be drawn wherever necessary.
3. Make suitable assumptions wherever required.

Q.1 a) Write difference between structure and union. 4

b) Explain recursive functions. Write C-program to find fibonacci series up to n terms using recursion. 6

Q.2 a) What is data structure? State its types. 4

b) Write C-function for selection sort. Apply selection sort to following input and show passes. 6

77, 33, 44, 11, 88, 22, 66, 55

Q.3 a) What is a queue data structure? Explain different applications of queue. 4

b) Write 'C' program to implement following operations on a circular queue using appropriate data structure. 6

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

- Q.4** a) What is stack? Explain its applications. 4
- b) Select and apply appropriate data structure to following problem statements. Show all steps. 6
- Convert infix expression to postfix : $A * (B + C - D / E) / F$
 - Evaluate postfix expression: $2 \ 4 * \ 9 \ 5 + -$

- Q.5** What is the difference between text and binary file? State and explain the different modes of opening a file in C using fopen() function. 5



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Seat No.

Institute: (0701)SYMBIOSIS INSTITUTE OF TECHNOLOGY, PUNE

Programme: (070121) BACHELOR OF TECHNOLOGY

Computer Science and Engineering

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

Semester: III

Course: Fundamentals of Data Structures

Course Code: 0701210303CS

Date: 20/11/2018

Maximum Marks: 60

Day: Tuesday

Time: 01:30 pm - 04:00 pm

Instructions:

1. All questions are compulsory.
2. Neat diagrams must be drawn wherever necessary.
3. Make suitable assumptions wherever required.

Q.1 a) What is call by value and call by reference in a function? Write a program to swap two numbers using call by value and call by reference. 6
b) Define ADT. State and explain different types of data structure. 8

Q.2 a) Apply bubble sort techniques for following set of input, show all the passes. 6
7, 5, 2, 4, 10, 1, 6, 3
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Institute: (0701)SYMBIOSIS INSTITUTE OF TECHNOLOGY, PUNE

Programme: (070121) BACHELOR OF TECHNOLOGY
Computer Science and Engineering, Information Technology
Batch: 2013-17
Semester: III
Course: Industrial Management
Course Code: 0701210306CS, 0701210306IT

Date: 18/11/2018

Maximum Marks: 45

Day: Sunday

Time: 08:30 am - 10:00 am

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 are the qualities needed in manager? | 5 |
| | b) What are the tools used for financial management? | 5 |
| | c) What is an alternative source of staffing and how is it done? | 5 |

PART B

- | | | |
|------|--|---|
| Q. 2 | a) Explain types of managerial skills and the Organizational Hierarchy. | 7 |
| | b) State and explain fourteen General Principles of Management. | 8 |
| Q.3 | a) What is a balance sheet and describe its contents? | 7 |
| | b) Describe the traditional as well as revised workflow process model and their pros and cons. | 8 |
| Q.4 | a) Describe the factors to be considered in designing an IT infrastructure. | 7 |
| | b) How to educate executives on the value of system management? | 8 |





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Programme: (070122) BACHELOR OF TECHNOLOGY (COMPUTER SCIENCE AND ENGINEERING)

(070124) BACHELOR OF TECHNOLOGY (INFORMATION TECHNOLOGY)

Batch: 2017-21

Semester: III

Course: Programming Paradigms

Course Code: 0701220302, 0701240302

Date: 22/11/2018

Maximum Marks: 45

Day: Thursday

Time: 01:30 pm - 03:00 pm

Instructions:

1. All questions are compulsory.
2. Support answer with relevant examples wherever applicable.
3. Draw necessary diagrams wherever applicable.

Q.1 a) Discuss all characteristics of a good programming language. **5**
 b) Elaborate different levels of programming language. **3**

Q.2 a) Discover four desirable and four undesirable characteristics of procedural programming. **4**
 b) Model execution steps for procedural programming, storage of floating point numbers in different formats. **4**
 c) Elaborate derived data types, their specification and basic representations. **5**

Q.3 Justify encapsulation in C++ using a program. **2**

Q.4 a) Explain inheriting constructors and destructors in C++ using a program. **5**
 b) Develop a program in C++ for virtual base class. **5**

Q.5 Inspect logical variable, logical statements, depth-first search in prolog with suitable examples. **8**

Q.6 Utilize any four types of operators and expressions in Python with their respective examples. **4**

OR

Q.6 Explain type checking with LISP programming. **4**





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Programme: (070121) BACHELOR OF TECHNOLOGY
Computer Science and Engineering, Information Technology
Batch: 2013-17,2014-18,2015-19,2016-20
Semester: III
Course: Programming Paradigms
Course Code: 0701220302CS, 0701240302IT

Date: 22/11/2018

Maximum Marks: 45

Day: Thursday

Time: 01:30 pm - 03:00 pm

Instructions:

1. All questions are compulsory.
2. Support answer with relevant examples wherever applicable.
3. Draw necessary diagrams wherever applicable.

- | | | |
|-----|--|---|
| Q.1 | a) Discuss all characteristics of a good programming language. | 5 |
| | b) Elaborate different levels of programming language. | 3 |
| Q.2 | a) Discover four desirable and four undesirable characteristics of procedural programming. | 4 |
| | b) Model execution steps for procedural programming, storage of floating point numbers in different formats. | 4 |
| | c) Elaborate derived data types, their specification and basic representations. | 5 |
| Q.3 | Justify encapsulation in C++ using a program. | 2 |
| Q.4 | a) Explain inheriting constructors and destructors in C++ using a program. | 5 |
| | b) Develop a program in C++ for virtual base class. | 5 |
| Q.5 | Inspect logical variable, logical statements, depth-first search in prolog with suitable examples. | 8 |
| Q.6 | Utilize any four types of operators and expressions in Python with their respective examples. | 4 |
| | OR | |
| Q.6 | Explain type checking with LISP programming. | 4 |

SYRIAC INTERNATIONAL (DELMED) UNIVERSITY

Established under Decree No. 3 of the UGCC As of 1928
Approved by the AAC As of 1928. Accredited by the AAC As of 1928.



SYRIAC INTERNATIONAL INSTITUTE OF TEACHERS EDUCATION



SYRIAC INTERNATIONAL

INSTITUTE OF TEACHERS EDUCATION

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INSTITUTE OF TEACHERS EDUCATION

I will address the members of the
Board of Directors of the Syriac International Institute of Teachers Education
of the following application:

On the basis of the application of the
University of the Syriac International Institute of Teachers Education
I request that you consider my application

for admission to the Syriac International Institute of Teachers Education
for the academic year 1928-1929.

I am a graduate of the Syriac International Institute of Teachers Education
and I have been working in the field of education for many years.

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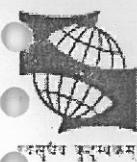
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Institute: (0701)SYMBIOSIS INSTITUTE OF TECHNOLOGY, PUNE

Programme: (070122) BACHELOR OF TECHNOLOGY (COMPUTER SCIENCE AND ENGINEERING)
(070124) BACHELOR OF TECHNOLOGY (INFORMATION TECHNOLOGY)

Batch: 2017-21

Semester: III

Course: Discrete Mathematics and Probability Theory

Course Code: 0701220301, 0701240301

Date: 24/11/2018

Maximum Marks: 60

Day: Saturday

Time: 01:30 pm - 04:00 pm

Instructions:

1. All Questions are compulsory.
2. Non programmable calculator is allowed.

Q.1 a) In a survey of 260 college students, 64 students select Mathematics, 94 select

Computer Science, 58 select Business course, 28 select Mathematics and Business course, 26 select Mathematics and Computer Science and 14 select Business course and Computer Science. 14 student select all three subjects. By Venn diagram, find the number of students selecting only Computer Science.

b) If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, $A = \{1, 2, 4, 8\}$, $B = \{2, 3, 4, 5, 9\}$

4
2

Then verify $\overline{(A \cup B)} = \bar{A} \cap \bar{B}$

Q.2 a) Prove that $(p \vee q) \wedge (\sim p \vee r) \rightarrow (q \vee r)$ is a tautology.

4

b) Using method of induction, prove that

4

$$1 \cdot 2 + 2 \cdot 3 + 3 \cdot 4 + \dots + n(n+1) = \frac{2n(n+1)(n+2)}{6}$$

Q.3 a) Let m be a positive integer such that $m > 1$. Show that the relation

4

$R = \{(a, b) | a \equiv b \pmod{m}\}$ is an equivalence relation.

b) Solve the recurrence relation $a_n + 2a_{n-1} - 15a_{n-2} = 4$ with

4

$a_0 = 0$ and $a_1 = 2$

c) Show that the set of all positive divisors of 42 form a POSET under the relation \leq defined as $a \leq b$ if a is a divisor of b .

4

d) Let $S = \mathbb{R} - \{-1\}$ and the operation $*$ is defined as $a * b = a + b + ab$ for $a, b \in S$ then show that $(S, *)$ is a group.

4

OR

- d) Let R be the set of all polynomial functions. Show that R is a ring under usual addition and multiplication. 4

- Q.4** a) The problem of statistics is given to three students A, B and C whose chances of solving it are $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{1}{4}$ respectively. What is the probability that the problem is solved? 4

- b) An electrician bought 250 multi-pins, 128 from Kumar Electronics, 52 from Muthu Electricals and 70 from Gupta suppliers. It is known that 10% of the multi-pins sold by Kumar Electronics are defective and the percentage of defective pins from other two shops are respectively 21% and 12%. A pin is selected at random and turns out to be defective. What is the probability that it was bought from Gupta suppliers?

- c) A random variable X has the following probability function 4

x	0	1	2	3	4	5	6	7
P(x)	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2 + k$

- (i) Find the value of k
(ii) Evaluate $P(X < 6)$ and $P(X \geq 6)$

- Q.5** a) 10 coins are tossed 600 times. In how many tosses one can expect 7 heads. 4

- b) The number of mistakes per page observed in a book are observed as follows. 5

No. of mistakes	0	1	2	3	4
No. of pages	211	93	20	5	1

Fit a Poisson distribution.

- Q.6** a) The mean inside diameter of a sample of 2000 washers produced by a machine is 5.02 mm and the standard deviation is 0.05 mm. The purpose for which these washers are intended allows a maximum tolerance in diameter of 4.96 to 5.08 mm otherwise the washer is considered to be defective. Determine the number of defective washers produced by the machine by assuming the data to be normally distributed. 5

- b) Buses arrive at a specific stop at 15 min interval starting from 7 am. If the passenger arrives at the stop at random time that is uniformly distributed between 7 to 7:30 am. Find the probability that the passenger waits less than 5 mins.

$$A(z=1.2) = 0.3849$$



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Programme: (070121) BACHELOR OF TECHNOLOGY

Computer Science and Engineering, Information Technology

Batch: 2013-17, 2014-18, 2015-19, 2016-20

Semester: III

Course: Discrete Structures

Course Code: 0701220301CS, 0701240301IT

Date: 24/11/2018

Maximum Marks: 60

Day: Saturday

Time: 01:30 pm - 04:00 pm

Instructions:

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

Q.1 a) State whether the following are propositions or not. Give explanation for your answer. 3

i) $x+1 = 2$

ii) Read this carefully.

iii) New Delhi is the capital of India.

b) Construct a truth table for the given compound proposition. 4

i) $(p \rightarrow q) \leftrightarrow (\neg q \rightarrow \neg p)$

c) Translate the given English statement into a logical expression. 3

i) "You can access the Internet from campus only if you are a computer science major or you are not a freshman."

Q.2 a) Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed? 4

b) In how many different ways can the letters of the word 'OPTICAL' be arranged so that the vowels always come together? 3

c) Find the probability of selecting a black card or a 6 from a deck of 52 cards. 3

Q.3 a) Let A be the set $\{1, 2, 3, 4\}$. Which ordered pairs are in the relation $R = \{(a, b) | a \text{ divides } b\}$? 3

b) Consider the following relations on $\{1, 2, 3, 4\}$:

$$R_1 = \{(1, 1), (1, 2), (2, 1), (2, 2), (3, 4), (4, 1), (4, 4)\},$$

$$R_2 = \{(1, 1), (1, 2), (1, 4), (2, 1), (2, 2), (3, 3), (4, 1), (4, 4)\},$$

$$R_3 = \{(2, 1), (3, 1), (3, 2), (4, 1), (4, 2), (4, 3)\},$$

$$R_4 = \{(1, 1), (1, 2), (1, 3), (1, 4), (2, 2), (2, 3), (2, 4), (3, 3), (3, 4), (4, 4)\},$$

c) Which of these are not reflexive? Give reasons for your answer. 4

Which elements of the poset $(\{2, 4, 5, 10, 12, 20, 25\}, |)$ are maximal, and which are minimal?

Q.4 a) Show that: $1^3 + 2^3 + 3^3 + \dots + n^3 = (1+2+3+\dots+n)^2$ using mathematical induction. 5

b) Let f be the function from $\{a, b, c, d\}$ to $\{1, 2, 3, 4\}$ with $f(a) = 4$, $f(b) = 2$, $f(c) = 1$, and $f(d) = 3$. Is f a bijection? Explain your answer. 2

- Q.4** c) Is the function $f(x) = x^2$ from the set of integers to the set of integers onto? Give reasons for your answer. 3
- Q.5** a) Form a binary search tree for the words mathematics, physics, geography, zoology, meteorology, geology, psychology, and chemistry (using alphabetical order). 4
 b) Use Huffman coding to encode the following symbols with the frequencies listed: A: 0.08, B: 0.10, C: 0.12, D: 0.15, E: 0.20, F: 0.35. 6
- Q.6** a) Define algebraic systems. State two properties of algebraic systems. 4
 b) Define homomorphism. Give examples of two homomorphic mapping from one algebraic system to another. 6



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Programme: (070122) BACHELOR OF TECHNOLOGY (COMPUTER SCIENCE AND ENGINEERING)
(070124) BACHELOR OF TECHNOLOGY (INFORMATION TECHNOLOGY)

Batch: 2017-21

Semester: III

Course: Digital Electronics and Logic Design

Course Code: 0701220307, 0701240307

Date: 29/11/2018

Maximum Marks: 45

Day: Thursday

Time: 01:30 pm - 03:00 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 Perform the following. 6

- $(101.11)_2 * (111.01)_2 = ()_2$ Binary multiplication.
- $(587)_{16} - (4EB)_{16} = ()_{16}$ Hexadecimal subtraction using 16's complement.
- $(499)_{10} - (575)_{10} = ()_{10}$ BCD subtraction using 10's complement.

Q.2 a) Prove the following statement. Also mention the name of the laws. 3

$$AB + C(A'B + AB') = AB + BC + AC$$

b) Design XNOR gate using NOR gates only. 3

Q.3 a) Solve the equation using k-map. 4

$$F(A,B,C,D) = (A+B+C'+D').(A'+C+D').(A'+B+C'+D').(B'+C).(B'+C')(A+B').(B'+D')$$

b) Convert the following expression into standard POS form. 3

$$Y = (A+B)(A+B'+C')(B+D')$$

Q.4 a) Design and explain two bit magnitude comparator using multiplexer circuits. 5

b) Design 4 bit binary to gray code convertor along with Truth table and K-map. 5

Q.5 a) How does a master-slave flip flop overcome a race around a problem? Why don't we use edge triggering in this type of flip flop? **6**

b) Explain SR flip flop with preset and clear input. Also draw the truth table. **6**

c) Compare sequential and combinational circuits. **4**



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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: 29/11/2018

Maximum Marks: 60

Day: Thursday

Time: 01:30 pm - 04:00 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 a) Simplify the Boolean function using K-map and realize it using NAND gates. 5

$$Y = \pi M(0, 2, 4, 5, 6, 8, 9, 12, 13, 14)$$

b) Design XOR gate and XNOR gate using any one universal gate. Show final output and output after every gate. 5

c) Prove the following statement. Also mention the name of the laws. 4

$$A'B + C(A'B + AB)' = A'B + A'C + BC$$

Q.2 Define any three characteristics of digital ICs. 6

Q.3 a) Perform the followings. 6

- i) $(536)_8 - (345)_8 = (\)_8$ octal subtraction using 8's complement.
- ii) $(DDCC)_{16} + (BBAE)_{16} = (\)_{16}$ Hexadecimal addition.
- iii) $(1234)_{10} - (4567)_{10} = (\)_{10}$ BCD subtraction using 10's complement.

b) Explain the operation of 4 bit magnitude comparator. 5

c) Design 4 bit binary to Gray code convertor along with Truth table and K-map. 5

- Q.4** a) Draw and explain the circuit diagram of 5-bit Serial In/Serial out (SISO) shift register. Show the timing diagram for specified data input 10101. Assume register initially clear all (0s). 6
- b) Explain SR flip flop with preset and clear input. Also draw the truth table. What is the major drawback of SR flip flop? 6
- c) Compare D and T flip flops. 3
- Q.5** 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.6** Explain different components of PLA with diagram. 4



SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)

(Established under Section 3 of the UGC Act, 1956)
Re-accredited by NAAC with 'A' Grade (3.58/4) Awarded Category - I by UGC

Seat No.							
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Institute: (0701)SYMBIOSIS INSTITUTE OF TECHNOLOGY, PUNE

Programme: (070121) BACHELOR OF TECHNOLOGY
Information Technology, Computer Science and Engineering
Batch: 2013-17,2014-18, 2012-16
Semester: III
Course: Digital Electronics & Logic Circuits
Course Code: 0701210305IT, 0701210305CS

Date: 29/11/2018

Maximum Marks: 60

Day: Thursday

Time: 01:30 pm - 04:00 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 a) Simplify the Boolean function using K-map and realize it using NAND gates. 5

$$Y = \pi M(0, 2, 4, 5, 6, 8, 9, 12, 13, 14)$$

b) Design XOR gate and XNOR gate using any one universal gate. Show final output and output after every gate. 5

c) Prove the following statement. Also mention the name of the laws. 4

$$A'B + C(A'B + AB)' = A'B + A'C + BC$$

Q.2 Define any three characteristics of digital ICs. 6

Q.3 a) Perform the followings. 6

- (536)₈ - (345)₈ = ()₈ octal subtraction using 8's complement.
- (DDCC)₁₆ + (BBAA)₁₆ = ()₁₆ Hexadecimal addition.
- (1234)₁₀ - (4567)₁₀ = ()₁₀ BCD subtraction using 10's complement.

b) Explain the operation of 4 bit magnitude comparator. 5

c) Design 4 bit binary to Gray code convertor along with Truth table and K-map. 5

Q.4 a) Draw and explain the circuit diagram of 5-bit Serial In/Serial out (\$ISO) shift register. Show the timing diagram for specified data input 10101. Assume register initially clear all (0s). 6

b) Explain SR flip flop with preset and clear input. Also draw the truth table. What is the major drawback of SR flip flop? 6

c) Compare D and T flip flops. 3

Q.5 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.6 Explain different components of PLA with diagram. 4



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Institute: (0701)SYMBIOSIS INSTITUTE OF TECHNOLOGY, PUNE

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

Batch: 2013-17,2014-18,2015-19,2016-20

Semester: III

Course: Computer Organization

Course Code: 0701220304CS

Date: 27/11/2018

Maximum Marks: 60

Day: Tuesday

Time: 01:30 pm - 04:00 pm

Instructions:

1. All questions are compulsory.
2. Make suitable assumptions wherever required.
3. Neat diagram must be drawn whenever necessary.

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|------------|--|---|
| Q.1 | a) Outline a flowchart of booth's algorithm for signed binary multiplication. Perform: $(-15) * 12$ | 6 |
| b) | Demonstrate $41.625_{(10)}$ in single precision floating point format. | 4 |
| c) | Explain different interconnection structure with neat diagram. | 6 |
| Q.2 | a) Illustrate register organization of 8086 microprocessor. | 6 |
| b) | Classify different addressing modes. | 4 |
| Q.3 | a) Explain microinstruction format with neat diagram. | 4 |
| b) | Summarize different methods for design of hardwired control unit. | 6 |
| Q.4 | a) Main memory has 3 page frames and processor requires pages from virtual memory in following order:

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. | 6 |
| b) | Outline Memory Hierarchy. | 4 |
| c) | With suitable diagram explain how mapping is performed in associative mapping cache organization. | 4 |
| Q.5 | a) Explain block diagram of I/O module. | 6 |
| b) | Demonstrate working mechanism of one of the important input device of computer called Mouse. | 4 |