



Shri Shankaracharya Institute of Professional Management & Technology
DEPARTMENT OF ELECTRONICS AND TELE. COMM.

Class Test – I

Session- July-Dec, 2023

Month-Oct 2023

Sem- 3rd

Subject-Mathematics-III

Code-B000312(014)

Time Allowed:2 hrs.

Max Marks: 40

Note: -First question is Compulsory from PART I & II Solve any 2 questions from PART I & II

Q.N.	Questions	Marks	Levels of Bloom's taxonomy	Cos
UNIT-I				
Q1	Form partial differential equation from $z = y^2 + 2f\left(\frac{1}{x} + \log y\right)$	[4]	Apply	CO1
Q2	Solve $(x^2 - y^2 - z^2)p + 2xyq = 2xz$	[8]	Apply	CO1
Q3	Solve Separation of variable $\frac{\partial u}{\partial x} = 2\frac{\partial u}{\partial t} + u$, where $u(x,0) = 6e^{-3x}$	[8]	Understanding	CO1
Q4	Solve $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial x \partial y} - 6\frac{\partial^2 z}{\partial y^2} = y \cos x$	[8]	Understanding	CO1
UNIT- II				
Q1	Bessel's formula is most appropriate when p lies betweenand Write Bessel's formula.	[4]	Applying	CO2
Q2	From the following table, estimate the number of students who obtained marks between 40 and 45: Marks: 30-40 40-50 50-60 60-70 70-80 No. of st.: 31 42 51 35 31	[8]	Understanding	CO2
Q3	Given θ° : 0 5 10 15 20 25 30 $\tan \theta$: 0 .0875 .1763 .2679 .3640 .4663 .5774 Using Stirling's formula estimate the value of $\tan 16^\circ$	[8]	Understanding	CO2
Q4	Apply Bessel's formula to obtain y_{25} , given $y_{20} = 2854, y_{24} = 3162, y_{28} = 3544, y_{32} = 3992$.	[8]	Understanding	CO2



Shri Shankaracharya Institute of Professional Management & Technology

Department of Electronics and Telecommunication Engineering

Class Test – I Session- July– Dec, 2023 Month- November

Sem- ET&T 3rd Subject- Electronic Devices–B000311(028)

Time Allowed: 2 hrs Max Marks: 40

Note: - Attempt any 5 question. All questions carry equal marks.

Q.NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	Explain in detail the phenomenon of current density and conductivity in semiconductor. Write any three difference between drift current and diffusion current.	[8]	Remembering	CO1
2.	Draw the energy band diagram of an open circuited P-N junction. Indicate fermi level and contact potential?	[8]	Understanding	CO1
3.	Derive the following expression for a step graded junction $V_0 = V_T \log_e \left(\frac{N_A N_D}{n_i^2} \right)$	[8]	Remembering & Understanding	CO1
4.	In intrinsic GaAs, the electron and hole mobilities are 0.85 and 0.04 m ² /V-s respectively and corresponding effective masses are 0.068 m ₀ and 0.5m ₀ respectively where m ₀ is the rest mass of an electron. If the energy gap of GaAs at 300K is 1.43 eV, calculate the intrinsic concentration and conductivity.	[8]	Apply	CO1
5.	(i) State mass action law as an equation and in words . (ii) Discuss the potential variation, electric field and charge density inside depletion layer of P-N junction .	[8]	Understanding	CO2
6.	Derive the expression $\frac{dp'}{dt} = \frac{-p'}{\tau_p}$ for the generation and recombination of charge carriers.	[8]	Apply	CO2
7.	What is transport phenomena in semiconductor explain. Write short notes (i) Mobility (ii) Resistivity (iii) conductivity	[8]	Understanding	CO2



Shri Shankaracharya Institute of Professional Management & Technology
Department of Electronics and Telecommunication Engineering
Class Test – I Session- July-Dec, 2023 Month- November
Sem- ETC+IT+CSE(AI) 3rd Subject- Digital System Design- B000313(028)
Time Allowed: 2 hrs Max Marks: 40

Note: - Q.1 is compulsory and attend any 4 from 2,3,4,5,6.

Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	a) Find Gray Code equivalent of Hexadecimal number $(A2C)_{16}$. b) Find 5421 BCD equivalent of 83. c) Add 9384 and 4888 in BCD code. d) Convert $(6AE2)_{16} = (?)_{10} = (?)_2$?	[8]	Understanding	CO1
2.	Reduce the following Expression to the simplest possible POS and SOP Forms. $F_2 = \sum m(1, 5, 6, 12, 13, 14) + d(2, 4)$	[8]	Apply	CO1
3.	a) A signal error correcting code for a 11-bit group 01101110101? b) Test the following hamming code sequence for 11-bit message and correct it if necessary (101001011101011)?	[8]	Apply	CO1
4.	Obtain the minimal expression using Quine – Mc Cluskey method. $f(A, B, C, D) = \sum m(1, 5, 6, 12, 13, 14) + d(2, 4)$	[8]	Apply	CO1
5.	Design B C D Adder by using IC's 7483. Or Design Full adder by using 3:8 decoder.	[8]	Design	CO2
6.	(a) Implement a full Subtractor using 8:1 multiplexer. (b) Design 1:16 Demultiplexer by using 1:4 & 1:2 De multiplexer.	[8]	Design	CO2

Shri Shankaracharya Institute of Professional Management & Technology
Department of Electronics and Telecommunication Engineering
Class Test – I Session- July-Dec, 2023 Month- November
Sem- ETC+IT+CSE(AI) 3rd Subject- Digital System Design- B000313(028)
Time Allowed: 2 hrs Max Marks: 40

Note: - Q.1 is compulsory and attend any 4 from 2,3,4,5,6.

Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	a) Find Gray Code equivalent of Hexadecimal number $(A2C)_{16}$. b) Find 5421 BCD equivalent of 83. c) Add 9384 and 4888 in BCD code. d) Convert $(6AE2)_{16} = (?)_{10} = (?)_2$?	[8]	Understanding	CO1
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5.	Design B C D Adder by using IC's 7483. Or Design Full adder by using 3:8 decoder.	[8]	Design	CO2
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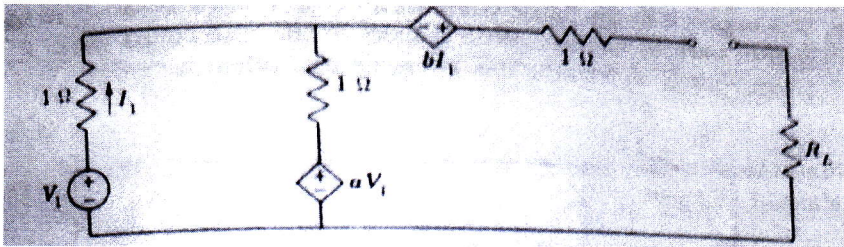
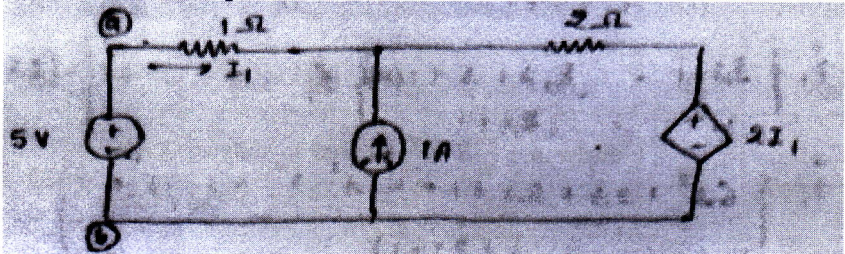
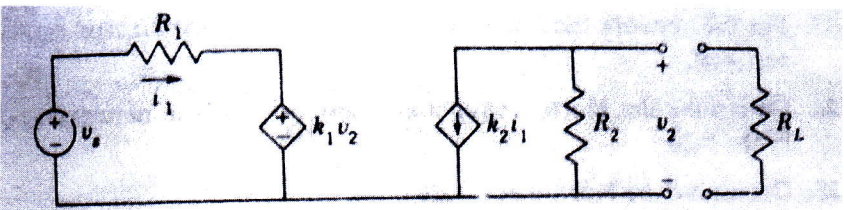
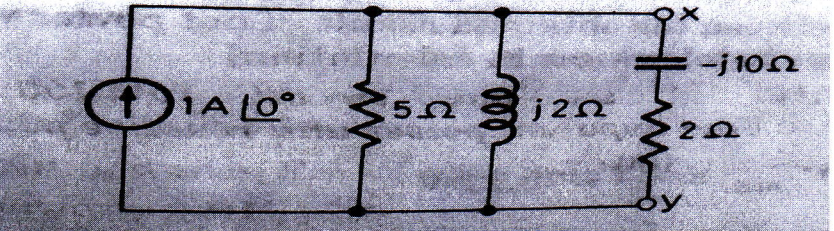
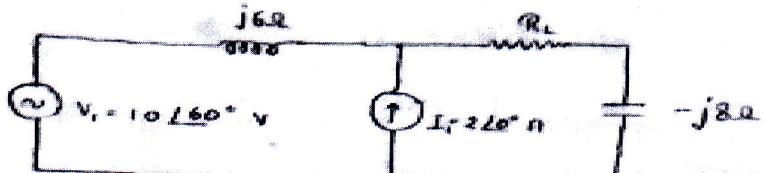
Shri Shankaracharya Institute of Professional Management & Technology
Department of Electronics and Telecommunication Engineering
Class Test – I Session- July. – Dec, 2023 Month- November
Sem- ET&T 3rd sem Subject - Data Structure using C++ - B000315(028)

Time Allowed: 2 hrs Max Marks: 40

Note: - All questions are compulsory. .

Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	What are the basic concepts of Object Oriented Programming (OOP)? List three benefits of OOP.	[2]	Remembering	CO1
2.	Explain the concept of classes and objects in C++ and how they are related to C structures.	[2]	Remembering	CO1
3.	How do you specify a class in C++? What is the significance of specifying a class?	[2]	Remembering	CO2
4..	Discuss the nesting of member functions within a class. Provide an example to illustrate the concept.	[4]	Understanding	CO1
5.	Explain the concept of constructors in C++. Describe the different types of constructors that can be used in a class.	[4]	Understanding	CO1
6.	Discuss the use of static data members and static member functions within a class. Provide examples to demonstrate their usage.	[4]	Understanding	CO1
7.	Describe the concept of "Arrays of Objects" in C++ and explain their use in object-oriented programming. Provide an example.	[4]	Understanding	CO2
8.	How are objects passed as function arguments in C++? Explain with an example. What is the significance of passing objects to functions?	[6]	Remembering	CO2
9.	What is a copy constructor, and when is it used in C++? Provide an example to demonstrate the purpose and usage of a copy constructor.	[6]	Remembering	CO1
10..	Explain the concept of destructors in C++. How do they differ from constructors? Provide examples to illustrate the use of destructors in object-oriented programming.	[6]	Remembering	CO2

Note: - Attempt any 5 question. All questions carry equal marks.

Q. NO.	Questions	Marks	Levels of Bloom's taxonomy	COs
1.	<p>For the network shown in figure find equivalent Thevenin network</p> 	[8]	Applying	CO1
2.	<p>State and prove Maximum power transfer theorem.</p>	[8]	Remembering	CO1
3.	<p>Find Norton's Equivalent circuit across terminal ab</p> 	[8]	Applying	CO1
4.	<p>The Network of the figure consists of resistors and controlled sources, find thevenin's equivalent network</p> 	[8]	Applying	CO1
5.	<p>State and Prove Reciprocity Theorem.</p>	[8]	Remembering	CO1
6.	<p>In the network of figure, find power delivered by the source.</p> 	[8]	Applying	CO1
7.	<p>Find the current in resistor RL using the principle of superposition</p> 	[8]	Applying	CO1