Total nos. of printed pages: 2 Roll No: | | | | | | | | | | |

MOTIHARI COLLEGE OF ENGINEERING, MOTIHARI

Odd Semester Session 2021-22 Mid Semester Exam

B. Tech. 3rd Semester, Computer Science & Engineering

Mathematics III

Time: 2 Hrs. Maximum Marks 20

Section A

Q1. Attempt all questions: **(1X5 = 5 Marks)**

a	What is Euler's Theorem on Homogeneous Function	CO2
b	Solve the differential equation $\frac{d^3y}{dx^3}+6\frac{d^2y}{dx^2}+11\frac{dy}{dx}+6y=0$	CO5
c	State Rodrigue's Formual	CO5
d	Show that $J_{\frac{1}{2}}(x)=J_{-\frac{1}{2}}(x)\cot x$	CO5
e	If $x=r\cos\theta,\ y=r\sin\theta$ *find* $\frac{\partial(x,\ y)}{\partial(r,\theta)}$	CO2

Section B

Q2-Q4 Attempt all questions: **(5X3 = 15 Marks)**

Q2	i)	Solve the differential equation $(D^2-1)y=x\sin x+(1+x^2)e^x$	CO5
		OR	
	ii)	Solve by the method of variation of parameters $\frac{d^2y}{dx^2}+4y=4\sec^2 2x$	CO5
Q3	i)	Prove that $J_{-\frac{1}{2}}(x)=\sqrt{\frac{2}{\pi x}}\cos x$	CO5
		OR	
	ii)	Prove the recurrence relation $(2n+1)xP_n(x)=(n+1)P_{n+1}(x)+nP_{n-1}(x)$	CO5
Q4	i)	Divide 24 into three parts such that the continued product of the first, square of the second and cube of the third may be maximum.	CO2
		OR	

ii) If $u = \tan^{-1}(\frac{y^2}{x})$, *prove that* $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2} = -\sin 2u \sin^2 u$ **CO2**

Total nos. of printed pages: 1

Roll No: | | | | | | | | | | |

MOTIHARI COLLEGE OF ENGINEERING, MOTIHARI

Odd Semester Session 2022-23 Mid Semester Exam

B. Tech. 3rd Semester, Computer Science Engineering

TECHNICAL WRITING

Time: 2 Hrs. Maximum Marks 20

Section A

Q1. Attempt all questions: **(1X5 = 5 Marks)**

a What is Technical Writing?

b What do you mean by Attributes/Characteristic?

c How many Citation format we use in Technical Writing?

d What is Etiquette?

e Write the uses of Memo?

Section B

Q2-Q4 Attempt all questions: **(5X3 = 15 Marks)**

Q2 i) Why technical writing is important for engineering professionals?

OR

ii) What are the attributes of technical Writing? Discuss.

Q3 i) Discuss the different types of Technical writing with examples?

OR

ii) Discuss the general guidelines for technical writings?

Q4 i) Write a proposal to the principal for installing electricity backup in your classroom?

OR

ii) Submit a report on summer internship (assuming the details as 15 days summer internship @ TCS)?

***

MOTIHARI COLLEGE OF ENGINEERING, MOTIHARI

B. Tech. Mid Semester Examination 2023

Branch : CSE
Subject Name : Analog Electronic Circuits
Duration of Exam: 2 hours

Semester :3rd
Subject Code :
Full Marks : 20

Instructions:

a. *There are four questions in this paper.*
b. *Each question carries equal (05) marks.*
c. *Assume suitable data if missing.*
d. *Draw neat and clean figures and diagrams whenever necessary.*

1. Answer all the questions in brief. Each question carries 01 Mark.
   a. Draw PN Junction diode characteristics. Mention all points and regions. **CO1**
   b. Differentiate enhancement type and depletion type MOSFET. **CO4**
   c. Draw the characteristics of a depletion type MOSFET. **CO4**
   d. Draw high frequency small signal model of a MOSFET. **CO4**
   e. Write the relation between current amplification factors α and β. **CO3**

2. In a full wave rectifier, the input is from a 30-0-30V transformer. The load resistance is 100 Ω. Calculate the average dc voltage, dc output power, ripple factor, and PIV across each diode. **CO1**

   Or

   Explain clipper and clamper circuit using suitable circuit diagrams and derivations.

3. In a Common Emitter transistor circuit if $\beta = 100$ and $I_B = 50\mu A$, compute the values of α, I_E and I_C. **CO2**

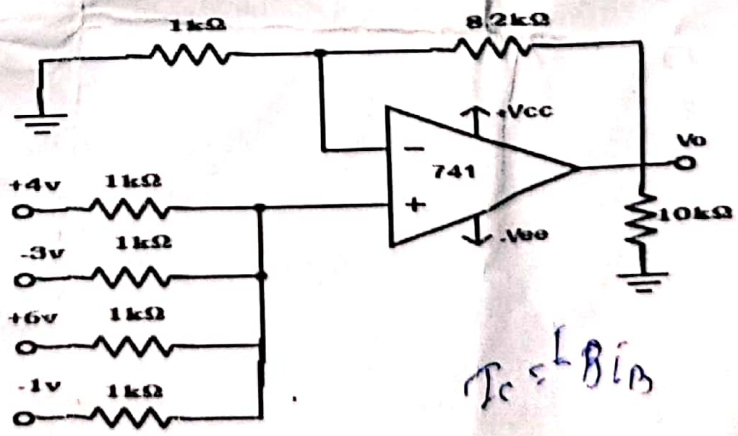
   Or

   Draw the common emitter circuit and sketch the input and output characteristics. Also explain active region, cut-off region and saturation region by indicating them on the characteristic curve.

4. Draw the circuit diagram of OP-AMP based signal integrator and differentiator. Derive the output voltage expression. **CO3**

   Or

   Find the output load current in the figure.



Total nos. of printed pages: 1 Roll No: | | | | | | | | | | |

MOTIHARI COLLEGE OF ENGINEERING, MOTIHARI

Odd Semester Session 2022-23 Mid Semester Exam

B. Tech. 3rd Semester, C. S. E

Data Structure & Algorithms

Time: 2 Hrs. Maximum Marks 20

Section A

Q1. Attempt all questions: **(1X5 = 5 Marks)**

a	What is data type and Abstract data type?	CO1
b	What is Big-O Notations?	CO1
c	What is Min Heap? Explain with Example.	CO5
d	What is Hashing in Data Structure? How collision will remove?	CO4
e.	Explain BFS and DFS with suitable Example.?	CO5

Section B

Q2-Q4 Attempt all questions: **(5X3 = 15 Marks)**

Q2	i)	Write a Link List program in C for Create the Link-list, Traverse the Link-list and Reverse the Link-list program. (2+1+2)	CO3
		OR	
	ii)	Write a program in C for Conversion of infix to postfix expression through Stack	CO3
Q3	i)	Construct Binary Search Tree and write Pre-order and Post-order transversal of this tree 15, 3, 1, 20, 10, 6, 14, 4, 7, 18, 24, 16, 21, 19, 17, 8, 23, 9, 25, 5, 13, 22, 2.	CO5
		OR	
	ii)	Construct AVL Tree with 5, 17, 64, 18, 26, 16, 68, 74, 8, 14, 92, 10, 64, 18, 26, 16. Delete 16 and 18 in AVL tree that you got. (4+1)	CO5
Q4	i)	Explain the Selection Sort with examples and discuss the performance in terms of time and space complexity (comparing with bubble sort and Merge sort). Write a program in C for Selection sort. (2+1+2)	CO4
		OR	
	ii)	Explain the Merge Sort with examples and discuss the performance in terms of time and space complexity (comparing with bubble sort and Selection sort). Write a program in C for Merge sort. (2+1+2)	CO4

Roll No: | | | | | | | | | | |

MOTIHARI COLLEGE OF ENGINEERING, MOTIHARI

Odd Semester Session 2021-22 Mid Semester Exam

B. Tech. 3rd Semester, Computer Science and Engineering

Subject:-OOPS

Time: 2 Hrs. Maximum Marks 20

Section A

Q1. Attempt all questions: **(1X5 = 5 Marks)**

a Define **private** access modifier.

b Constructor is a……..

c How to create object of a class.

d Describe an Identifier.

e Write notation of ternary operator.

Section B

Q2-Q4 Attempt all questions: **(5X3 = 15 Marks)**

Q2 i) Describe any five features of Object Oriented Programming.

OR

ii) Write a program to check enter number is odd or even using OOPS concept.

Q3 i) Write differences between classes and structure also write syntax.

OR

ii) Demonstrate with program relation among base class ,sub base class and sub sub base class.

Q4 i) Write a program to print employee details like name, id and salary using constructor .

OR

ii) Explain function overloading and also write program related to function overloading.