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<b>R-19</b>
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**Code: 19A421T**

I B.Tech. II Semester Supplementary Examinations July/August 2022

**Electronic Devices and Circuits**

(Common to EEE & ECE)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

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	Marks	CO	Blooms Level
<b>UNIT-I</b>			
1. a) Summarize the different BJT configurations.	7M	1	2
b) Discuss how voltage divider bias is more advantageous than fixed bias.	7M	1	2
<b>OR</b>			
2. a) Determine the stability factor of a fixed bias silicon transistor with the following specifications: $V_{CC} = 9V$ , $R_C = 3\text{ K Ohms}$ , $R_B = 8\text{ K Ohms}$ , $\beta = 50$ , and $V_{BE} = 0.7\text{ V}$ .	7M	1	3
b) Write short notes on Thermal Resistance and Thermal Stability.	7M	1	6
<b>UNIT-II</b>			
3. a) Write the necessary steps for gate bias circuit design and voltage divider bias circuit design.	7M	2	6
b) What are the differences between Bipolar Junction Transistor & Field Effect Transistor?	7M	2	1
<b>OR</b>			
4. Explain the construction, working principle and characteristics of enhancement mode MOSFETS.	14M	2	2
<b>UNIT-III</b>			
5. a) Draw and explain the amplifier equivalent circuit in detail	7M	3	3
b) Explain about Voltage gain, Current gain and Power gain of an amplifier when it is drawn in equivalent circuit form	7M	3	2
<b>OR</b>			
6. Derive the expressions for input resistance, output resistance and voltage gain of an emitter follower circuit.	14M	3	2
<b>UNIT-IV</b>			
7. a) What is the importance of input impedance in amplifier circuit, Explain?	7M	4	2
b) What are the advantages of FET amplifier over BJT amplifier?	7M	4	2
<b>OR</b>			
8. a) Draw and explain the notations of AC Equivalent circuit for MOSFETs	7M	4	2
b) Briefly explain about Common Source MOSFET Amplifier.	7M	4	1
<b>UNIT-V</b>			
9. a) Discuss the principle of operation of UJT.	7M	5	1
b) Write a note on LED.	7M	5	2
<b>OR</b>			
10. a) In what respect is an LED different from an ordinary PN junction diode? State applications of LED.	7M	5	3
b) Explain the working principle of UJT with neat diagram. Mention its applications.	7M	5	4

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<b>R-19</b>
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**Code: 19AC24T**

I B.Tech. II Semester Supplementary Examinations July/August 2022

**Engineering Chemistry**

( Common to EEE & ECE )

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

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	Marks	CO	Blooms Level
<b>UNIT-I</b>			
1. a) List out the different types of ion selective electrodes.	10M	CO1	L1
b) Define electrode potentials with examples.	4M	CO1	L1
<b>OR</b>			
2. a) Differentiate an electrochemical cell and galvanic cell.	7M	CO1	L4
b) Apply electrochemical convention methods to represent the cell.	7M	CO1	L4
<b>UNIT-II</b>			
3. a) List out the Merits of fuel cell	8M	CO2	L1
b) Write short notes on i) electrode ii) electrolyte iii) salt bridge.	6M	CO2	L1
<b>OR</b>			
4. Discuss the construction and working principle of Zinc-air battery	14M	CO2	L3
<b>UNIT-III</b>			
5. a) Write short notes on the preparation of multi-crystalline and amorphous Silicon.	8M	CO3	L1
b) List out the various applications of solar energy.	6M	CO3	L1
<b>OR</b>			
6. Illustrate the doping mechanism of n and -p-type Silicon Semiconductors	14M	CO3	L4
<b>UNIT-IV</b>			
7. a) Write the preparation, properties and uses of urea-formaldehyde resin.	10M	CO4	L1
b) What is step growth polymerization? Explain with examples.	4M	CO4	L1
<b>OR</b>			
8. a) Discuss the various steps of free radical polymerization with examples	10M	CO4	L2
b) Explain the various types of stereospecific polymers with examples.	4M	CO4	L2
<b>UNIT-V</b>			
9. a) List out various application of TEM	10M	CO5	L1
b) What are rotaxanes and catenanes? Give examples.	4M	CO5	L1
<b>OR</b>			
10. Explain the function of cyclodextrin based switches,			
i) in and out switching			
ii) back and forth switching.	14M	CO5	L3

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<b>R-19</b>
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**Code: 19A522T**

I B.Tech. II Semester Supplementary Examinations July/August 2022

**Programming through Python**

( Common to EEE & ECE )

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks )

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**UNIT-I**

- |  | Marks | CO  | Blooms Level |
|--|-------|-----|--------------|
| 1. a) Describe and illustrate Boolean operators with examples. | 7M    | CO1 | L2           |
| b) Write a program using if statements in Python.              | 7M    | CO1 | L3           |

**OR**

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|--|-----|-----|----|
| 2. Difference between sequential, selection, and iterative control | 14M | CO1 | L4 |
|--|-----|-----|----|

**UNIT-II**

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|--|-----|-----|----|
| 3. Define set and illustrate set in Python with suitable example | 14M | CO2 | L2 |
|--|-----|-----|----|

**OR**

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|--|-----|-----|----|
| 4. Define dictionary data type in python? Illustrate dictionary with suitable example. | 14M | CO2 | L3 |
|--|-----|-----|----|

**UNIT-III**

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|--|----|-----|----|
| 5. a) Write a python program to write some text into a file. | 7M | CO3 | L2 |
| b) Discuss about string traversal in python                  | 7M | CO3 | L2 |

**OR**

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|--|----|-----|----|
| 6. a) How to deal with text files in python?           | 7M | CO3 | L3 |
| b) Write a python program to read the lines of a file. | 7M | CO3 | L3 |

**UNIT-IV**

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|--|-----|-----|----|
| 7. Illustrate encapsulation with suitable example. | 14M | CO4 | L3 |
|--|-----|-----|----|

**OR**

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|---|----|-----|----|
| 8. a) Explain the difference between a reference and dereferenced value | 7M | CO4 | L3 |
| b) Infer about constructors in Python                                   | 7M | CO4 | L4 |

**UNIT-V**

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|--|-----|-----|----|
| 9. What is stack? Demonstrate stack operations with the example. | 14M | CO5 | L3 |
|--|-----|-----|----|

**OR**

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|--|-----|-----|----|
| 10. Outline the concept of queue implementation using python list. | 14M | CO5 | L4 |
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**Code: 19AC21T**

I B.Tech. II Semester Supplementary Examinations July/August 2022

**Differential Equations and Vector Calculus**

( Common to All Branches )

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

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		Marks	CO	Blooms Level
<b>UNIT-I</b>				
1.	Solve $\frac{d^2y}{dx^2} + y = e^{-x} + e^x \sin x$	14M	CO1	L3
<b>OR</b>				
2.	Solve $(D^2 + 1)x = t \cos t$ given $x = 0, \frac{dx}{dt} = 0$ at $t = 0$ .	14 M	CO1	L3
<b>UNIT-II</b>				
3.	Solve $x^2 \frac{d^2y}{dx^2} - 4x \frac{dy}{dx} + 6y = x^2$	14M	CO2	L3
<b>OR</b>				
4.	Solve $(2x + 3)^2 \frac{d^2y}{dx^2} - (2x + 3) \frac{dy}{dx} - 12y = 6x$	14M	CO2	L3
<b>UNIT-III</b>				
5.	Solve $x^2(y - z)p + y^2(z - x)q = z^2(x - y)$	14M	CO3	L3
<b>OR</b>				
6.	Using the method of separation of variables, solve $\frac{\partial u}{\partial x} = 2 \frac{\partial u}{\partial t} + u$ where $u(x,0) = 6e^{-3x}$	14M	CO3	L3
<b>UNIT-IV</b>				
7.	Evaluate the line integral $\int_c [(x^2 + xy)dx + (x^2 + y^2)dy]$ where c is the square formed by the lines $x = \pm 1$ and $y = \pm 1$ .	14M	CO4	L2
<b>OR</b>				
8.	Find the angle between the surfaces $x^2 + y^2 + z^2 = 9$ and $z = x^2 + y^2 - 3$ at the point (2,-1,2)	14M	CO4	L2
<b>UNIT-V</b>				
9.	Verify Gauss divergence theorem for $\vec{F} = x^2 \vec{i} + y^2 \vec{j} + z^2 \vec{k}$ , over the cube formed by the planes $x=0, x=a, y=0, y=b, z=0, z=c$ .	14M	CO5	L3
<b>OR</b>				
10.	Verify Green's theorem in the plane for $\oint (3x^2 - 8y^2)dx + (4y - 6xy)dy$ where C is the region bounded by $x = 0, y = 0$ and $x + y = 1$ .	14M	CO5	L3

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