Code No: **R231109** **R23** **SET - 1**

I B. Tech I Semester Supplementary Examinations, June/July-2024
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to CE, ME, ECE, IT, AME, Mining, Robotics, Agri E, ECE-Allied, CSE- Allied)

Time: 3 hours Max. Marks: 70

*Note: 1. Question paper consists of two parts (**Part-A** and **Part-B**)*
*2. All the questions in **Part-A** is Compulsory*
*3. Answer **ONE** Question from **Each Unit** in **Part-B***

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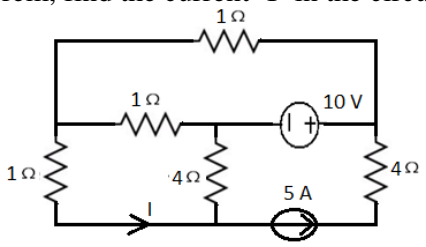
PART –A (10 Marks)

1.	a)	Write the relationship between voltage and current in a resistor.	[1M]
	b)	What is frequency?	[1M]
	c)	Define slip.	[1M]
	d)	What is unit in electrical energy terms?	[1M]
	e)	What is the full form of MCB?	[1M]
	f)	How many layers are present in BJT?	[1M]
	g)	What is a semiconductor?	[1M]
	h)	What a rectifier does?	[1M]
	i)	What is the output of an NAND gate if the inputs of it are 1 and 0?	[1M]
	j)	What is a binary number?	[1M]

PART – B (60 MARKS)

UNIT-I

2. Using superposition theorem, find the current 'I' in the circuit below [10M]



(OR)

3 Calculate current, active power, reactive power, apparent power and power factor for the circuit having impedance (5+j10) Ω connected fed from an AC supply of 200V. [10M]

UNIT-II

4. Discuss in detail about the construction and working of DC motor in detail. [10M]

(OR)

5. Discuss in detail about the construction and working of Wheatstone bridge in detail. [10M]

UNIT-III

6.	a)	Draw the layout of wind power generation system and explain.	[5M]
	b)	Explain the working principle of fuse in detail.	[5M]

(OR)

7.	a)	Explain the principle of working of Hydel power generation system in detail.	[5M]
	b)	How electricity bill is calculated for domestic consumers? Explain.	[5M]

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UNIT-I

8. With the help of neat structure and characteristics, explain about Zener diode. [10M]

(OR)

9. Draw the CE configuration of BJT and its characteristics. Explain about them in detail. [10M]

UNIT-II

10. Draw the circuit diagram of zener voltage regulator and explain its working in detail. [10M]

(OR)

11. Explain the applications of rectifiers and amplifiers in detail. [10M]

UNIT-III

12. a) What is a Gray code? Explain in detail. [5M]

    b) What are the differences between combinational and sequential circuits? Explain. [5M]

(OR)

13. a) Explain the basic theorems of Boolean algebra in detail. [5M]

    b) Discuss about the functionality of AND gate with the help of its truth table. [5M]

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Code No: **R201110** **R20** **SET - 1**

I B. Tech I Semester Supplementary Examinations, June/July-2024

PROGRAMMING FOR PROBLEM SOLVING USING C

(Common to EEE, ME, ECE, CSE, CSE-CS&T, EIE, IT, ECT, Auto Eng, Min Eng, Pet Eng, CSE-AI&ML, CSE-AI, CSE-DS, CSE-AI&DS, CSE-CS, CSE-IOT &CS Incl BCT, CSE-CS & BS, CSE-IOT, Food Eng, AI&DS)

Time: 3 hours Max. Marks: 70

Answer any FIVE Questions ONE Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1. a) How are signed and unsigned integers represented in computer memory? Explain with an example. [7M]

   b) Write about Octal number system. And explain the procedure to convert $(2625)_8$ into decimal and hexadecimal numbers. [7M]

(OR)

2. a) What is the significance of Storage class of a variable in C? Discuss various Storage class specifiers available in C programming. [7M]

   b) How the precedence and associativity rules are used when evaluating a C expression? What is the output of the following C code snippet? [7M]

```
int a = 9, b = 4, c=3, d=2, result;
result= a+a*-b/c%d+c*d;
printf("result = %d", result);
```

UNIT-II

3. a) Explain the concept of Short circuiting in regard to Logical operators in C programing. What is the output of the following C Code snippet? [7M]

```
int a = 10, b = 20,  c= 30, d = 40;
int e = ++a || ++b || ++c && ++d;
printf("a = %d,  b=%d,    c=%d,  d=%d,  e=%d", a,b,c,d,e);
```

   b) Write about Standard Mathematical functions in C library. Write an example program [7M]

(OR)

4. a) Explain the differences between while and do-while statements in C with a suitable example. [7M]

   b) Elaborate the output of the following C program. [7M]

```
#include <stdio.h>
int main()
{
    short int k=1, j=1;
    while(k<=4 || j<=3)
    {
        k=k+2;
        j+=1;
    }
    printf("%d   %d",k,j);
    return 0;
}
```


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Code No: **R201110** **R20** **SET - 1**

UNIT-III

5. a) What is an Array? What are the various types of Arrays supported by C programming? And describe the advantages of using arrays when compared to a bunch of related variables. [7M]

   b) List and Explain various String manipulation functions available in C library with program. [7M]

(OR)

6. a) Develop a C program to add two complex numbers using structures. [10M]

   b) Discuss the benefits and limitations of bit fields in C programming. [4M]

UNIT-IV

7. a) Why we use Pointer variables instead of memory variables in C? Give the syntax to declare, initialize and access pointer variables. [7M]

   b) Describe the significance of L value R value. Illustrate these concepts in pointer arithmetic with a program. [7M]

(OR)

8. a) Explain the differences between char *S and char S[] with a C program. [7M]

   b) Write about preprocessor directives and commands in C language. Discuss its merits and demerits. [7M]

UNIT-V

9. a) What is Recursive Function? What are the constraints for defining a Recursive function? Explain with an example. [7M]

   b) How to pass argument to functions in C? Explain with the case of arrays. [7M]

(OR)

10. a) List and Explain various functions used for opening, closing and processing files in C. [7M]

    b) Develop a C program to store the details of 'N' number of Students (Rno, Name, Branch, Grade) to a file named stddetails.txt using formatted I/O functions. [7M]

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Code No: **R19BS1106** **R19** **SET - 1**

I B. Tech I Semester Supplementary Examinations, June/July-2024
APPLIED CHEMISTRY

(Common to EEE, ECE, CSE, EIE, IT)

Time: 3 hours Max. Marks: 75

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

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UNIT-I

1. a) Write a note on the vulcanization process for the preparation of elastomers. [8M]
   b) Discuss recycling of e-plastic waste. [7M]

(OR)

2. a) Explain how the Bakelite can be prepared and discuss its properties and applications. [8M]
   b) What are the applications of polymers in biomedical field? Discuss. [7M]

UNIT-II

3. a) Give a detailed note on nickel-metal hydride cells. [8M]
   b) Write the constituents and functions of paints. [7M]

(OR)

4. a) Discuss the working principle, electrode reactions and applications of CH_3OH-O_2 fuel cell. [8M]
   b) Define corrosion and discuss stress corrosion and factors influencing the rate of corrosion. [7M]

UNIT-III

5. a) Discuss the characteristics and applications of Type–I and Type–II superconductors. [8M]
   b) Write a brief note on the structure and applications of carbon nanotubes. [7M]

(OR)

6. a) Provide a brief note on electric insulators, ferromagnetism and ferrimagnetisms. [8M]
   b) Explain how the P-N junction diode works as rectifier. [7M]

UNIT-IV

7. a) Discuss Ab Initio studies. [8M]
   b) Write a note on acid-base controlled molecular shuttle. [7M]

(OR)

8. a) Give an account on the characteristics of molecular motors and machines. [8M]
   b) Provide an account on the rotaxane and catenane-based artificial molecular machines. [7M]

UNIT-V

9. a) Derive Beer-Lambert law and discuss its disadvantages. [8M]
   b) Write a note on tidal and wave power. [7M]

(OR)

10 a) Discuss the design and working principle of photovoltaic cell and mention its advantages. [8M]
   b) Write a note on the procedure and applications of magnetic resonance imaging. [7M]

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Code No: **R161104** **R16** **SET - 1**

I B. Tech I Semester Supplementary Examinations, June/July-2024
APPLIED PHYSICS
(Common to ECE, CSE, IT, EIE, E Com E)

Time: 3 hours Max. Marks: 70

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*Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)*
*2. Answering the question in **Part-A** is Compulsory*
*3. Answer any **FOUR** Questions from **Part-B***

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PART –A (14 Marks)

1. a) What are the coherent sources? [2M]
   b) Define the resolving power of an optical instrument. [2M]
   c) How is population inversion achieved in a LASER? [2M]
   d) Give one example for vector and scalar fields. [2M]
   e) What are the matter waves? [2M]
   f) Define conduction and valance bands in crystalline solids. [2M]
   g) Write any one application of the Hall effect. [2M]

PART –B (56 Marks)

2. a) Explain the basic principle behind the interferometer. Discuss the essential elements required to construct any one of the interferometers. [10M]
   b) What is the nature of the central fringe of Newton's rings when viewed under reflection geometry? Justify your answer. [4M]

3. a) Give qualitative treatment of diffraction effects that occur at the circular aperture. [10M]
   b) Distinguish between Fraunhofer and Fresnel diffraction. [4M]

4. a) What is polarized light? Discuss in detail the working principle of a polarimeter. [10M]
   b) Discuss any four characteristics of LASER light. [4M]

5. a) Derive electromagnetic wave equation in a dielectric medium. [10M]
   b) State Gauss and Stokes theorems. [4M]

6. a) What are the main postulates of the quantum free electron theorem? Explain the concept to Fermi energy. [10M]
   b) Write down the physical significance of a wave function. [4M]

7. a) Obtain the carrier density in an N-type semiconductor. [10M]
   b) What are the drift and diffusion currents in a semiconductor? [4M]

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