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R-17

Code: 7G111

I B.Tech. I Semester Supplementary Examinations June 2022

Problem Solving Techniques and C Programming

(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)

Marks

UNIT-I

1. a) Define Computer? Explain hardware and software components of a computer.
- b) Write an algorithm and draw a flow chart to calculate percentage of a student in six subjects.

OR

2. a) Explain different types of computer languages in detail.
- b) What is Keyword? Write and explain any ten keywords in C programming language.

UNIT-II

3. a) Define operator? Describe different types of operators used in C language with example.
- b) What are formatted input and output functions used in C explain with an example.

OR

4. a) Explain different data types in C programming language.
- b) Evaluate the following expression by using rules of precedence and associativity.
 - i) $4 / 3 + 5 - 2 + 3 / 5$
 - ii) $3 * 6 + 9 - 10 / 6$

UNIT-III

5. a) What is an Array? Explain how to declare and initialize a one dimensional array in C with an example.
- b) Write code segments for displaying numbers from 1 to 10 using while, do..while and for statements.

OR

6. a) Write a C Program to check whether given number is Armstrong number or not
- b) Write a C program to accept and print the elements in a two dimensional array.

UNIT-IV

7. Explain about any four string handling functions with an example.

OR

8. Write a C program to find whether the given string is a palindrome or not.

UNIT-V

9. a) What is a function? Describe different categories of function with suitable example programs.
- b) Write a C program to find factorial of a number using recursion.

OR

10. a) What is the scope of variables of type extern, auto, register and static? Explain with example.
- b) Describe any four preprocessor commands with suitable examples.

Code: 7GC14

I B.Tech. I Semester Supplementary Examinations June 2022

Engineering Mathematics-I

(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)

UNIT-I

1. Find the Rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ -2 & -3 & 1 & 2 \\ -3 & -4 & 5 & 8 \\ 1 & 3 & 10 & 14 \end{bmatrix}$

OR

2. Verify Cayley-Hamilton theorem for the matrix for the matrix $A = \begin{bmatrix} 3 & 2 & 4 \\ 4 & 3 & 2 \\ 2 & 4 & 3 \end{bmatrix}$

UNIT-II

3. a) Show that the Eigen values of a Hermitian matrix are all real

b) Show that $\frac{1}{2} \begin{bmatrix} 1+i & -1+i \\ 1+i & 1-i \end{bmatrix}$ is a unitary matrix

OR

4. Show that $A = \begin{bmatrix} i & 0 & 0 \\ 0 & 0 & i \\ 0 & i & 0 \end{bmatrix}$ is Skew-Hermitian and also unitary matrix.

UNIT-III

5. a) Solve $\int \frac{(1+y^2)dx}{x^2} = (\tan^{-1}y - x)dx$

b) Solve $\frac{dy}{dx} + x \sin 2y = x^3 \cos^2 y$

OR

6. If the temperature of a body is changing from 100°C to 70°C in 15 minutes, find when the temperature will be 40°C, if the temperature of air is 30°C.

UNIT-IV

7. Solve $\frac{d^2y}{dx^2} + a^2y = \tan ax$ by the method of variation of parameters.

OR

8. Solve $\frac{d^3y}{dx^3} - y = e^x + \sin 3x + 2$

UNIT-V

9. If $x + y + z = u, y + z = uv, z = uvw$, then evaluate $\frac{\partial(x, y, z)}{\partial(u, v, w)}$

OR

10. Find the maxima and minima of $z = x^3 + 3xy^2 - 3x^2 - 3y^2 + 4$

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Code: 7GC13

I B.Tech. I Semester Supplementary Examinations June 2022

Engineering Physics
(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)

Marks

UNIT-I

- a) Explain the theory of diameter of Newton's n^{th} ring
- b) What is diffraction and explain diffraction spectrum in case grating

OR

- a) Describe and derive condition of the stimulated emission through Einstein co-efficient
- b) Define and derive the numerical aperture of optical fiber and calculate accept angle of fiber of n_1 & n_2 are 1.486 & 1.482 respectively

UNIT-II

3. Show that the FCC is the most closely packed of the three cubic structures by working out the packing factors.

OR

4. Describe how ultrasounds can be produced using the piezoelectric principle.

UNIT-III

5. a) Deduce Schrodinger's time independent wave equation
- b) Write the sources of electrical resistivity

OR

6. a) Describe the importance of Fermi-Dirac distribution function
- b) Explain qualitative treatment of periodicity of electron in crystals

UNIT-IV

7. Explain with a suitable diagram working of Hall effect and its uses.

OR

8. a) Describe with an appropriate diagram working of a P-N junction diode.
- b) Elaborate Josephson effects and their applications.

UNIT-V

9. a) What is Bohr Magneton? Give an account of domain theory of ferromagnetism.
- b) What are the different types of CNT? Outline their properties?

OR

10. a) What are the principles of nanomaterials
- b) Describe any synthesis of nanomaterials and CNT with applications

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R-17

Code: 7G311

I B.Tech. I Semester Supplementary Examinations June 2022
Fundamentals of Electrical & Electronics Engineering
(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)

Marks

UNIT-I

1. Classify the types of resistors. Explain any three types with neat diagram.

OR

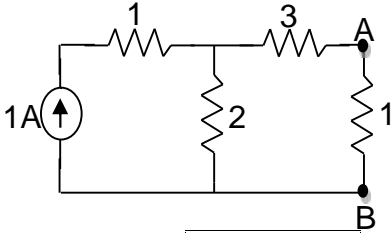
- 2. a) State ohms law. Give the relation between voltage and current for capacitor, inductor and resistor.
- b) Determine the color coding for the following resistors.
i) 100K ii) 47 iii) 2.2K iv) 10K

UNIT-II

3. State and explain Kirchoff's laws with example.

OR

4. Find current through 1 resistor using Norton's theorem for the circuit given below



UNIT-III

- 5. a) Discuss the effect of temperature on characteristics of PN junction diode.
- b) The voltage across a silicon diode at room temperature of 300°K is 0.62V when 2mA current flows through it. If the voltage increases to 0.80V, calculate the new diode current.

OR

- 6. a) Write short notes on Diffusion capacitance
- b) Explain how Zener diode act as voltage regulator.

UNIT-IV

7. Illustrate the operation of Full wave rectifier with capacitor filter and derive the Ripple factor.

OR

- 8. a) Derive the expression for ripple factor and efficiency for half wave and full wave rectifiers.
- b) Define the following i) Average current ii) RMS current iii) PIV

UNIT-V

- 9. a) Derive the relation between and
- b) Explain the operation of PNP transistor with neat diagram.

OR

- 10. a) Compare CB, CE configurations of a transistor.
- b) Define the following i). Active region ii) saturation region iii) Cut-off region.
