R-15

Code: 5GC13

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)
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Marks

UNIT–I

1. a) Explain the theory of diameter of Newton's n^{th} ring

   b) What is diffraction and explain diffraction spectrum in case grating

OR

2. 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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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)
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Marks

UNIT–I

1. a) Define Computer? Explain hardware and software components of a computer.
   b) Write and 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 in 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 arrays 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 weather given number is Armstrong number or not
   b) Write a C program to accept and print the elements in a two dimensional arrays.

UNIT–IV

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

OR

8. Write a C program to find the given string is 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 command with suitable examples.

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R-15

Code: 5GC14

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)

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UNIT–I

1. Solve $x\dfrac{dy}{dx} + y = x^3 y^6$

OR

2. A body originally at 80° C cools down to 60° C in 20 minutes, the temperature of the air being 40° C. What will be the temperature of the body after 40 minutes from the original and when will be the temperature be 50° C.

UNIT–II

3. Solve $(D^2 + 4)y = x^2 + \cos 2x$

OR

4. Solve $(D^3 + 2D^2 + D)y = e^{-x} + \sin 2x$

UNIT–III

5. Verify Rolle's theorem for $f(x) = \dfrac{\sin x}{e^x} in (0, f)$

OR

6. Expand e^x in powers $(x-1)$ upto four terms.

UNIT–IV

7. If $u = x^2 - 2y, v = x + y + z, w = x - 2y + 3z$, then find $\dfrac{\partial(u, v, w)}{\partial(x, y, z)}$

OR

8. If $x = r\cos_{\,\prime\prime}, y = r\sin_{\,\prime\prime}$, then find $\dfrac{\partial(x, y)}{\partial(r, \prime\prime)}$.

UNIT–V

9. Trace the curve $y^2(2a - x) = x^3$

OR

10. Trace the curve $x = a(_{\prime\prime} + \sin_{\,\prime\prime}), \; y = a(1 + \cos_{\,\prime\prime})$

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