Hall Ticket Number :										

R-17

Code: 7G311

I B.Tech. I Semester Supplementary Examinations March/April 2023

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)

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UNIT–I

1. a) Write voltage, current, power and energy relations for the circuit elements given below. i) Resistor ii) Inductor iii) Capacitor — 9M

   b) Differentiate ideal and practical voltage source. — 5M

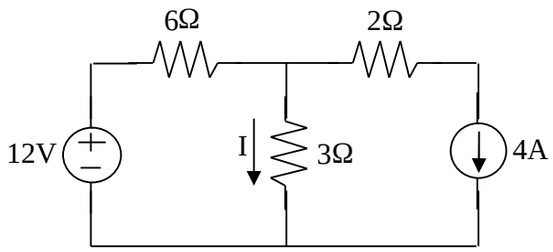
OR

2. Classify the types of sources and explain their properties with neat circuit diagrams. — 14M

UNIT–II

3. a) State the following i) Ohms law ii) KVL iii) KCL — 9M

   b) Find the current 'I' using Kirchoffs Current Law (KCL)



5M

OR

4. a) Differentiate series and parallel circuit — 9M

   b) Find voltage across 5Ω, 6Ω resisters using voltage division rule for the circuit given below

5M

UNIT–III

5. a) Draw and explain the characteristics of PN junction diode. — 9M

   b) Illustrate the function of Zener diode as a voltage regulator. — 5M

OR

6. a) Write the applications of Zener and PN junction diode — 8M

   b) Define the following i) cut in voltage(V_c) ii) Static resistance iii) Dynamic Resistance — 6M

UNIT–IV

7. a) List the merits and demerits of LC filter. — 6M

   b) Derive the expression for ripple factor and efficiency for half wave and full wave rectifiers. — 8M

OR

8. A half wave rectifier circuit is supplied from a 230V,50 Hz supply with a step down ratio of 3:1 to a resistive load of 10kΩ. The diode forward resistance is 75Ω while the transformer secondary resistance is 10Ω. Calculate maximum, average, RMS values of current, DC output voltage, effiency of rectification and ripple factor. — 14M

UNIT–V

9. a) With neat diagram explain the various current components of NPN transistor. — 7M

   b) Derive the relation between α and β — 7M

OR

10. Explain the operation of function generator with neat diagram. — 14M

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Hall Ticket Number :										

R-17

Code: 7G111

I B.Tech. I Semester Supplementary Examinations March/April 2023

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) Give a comparison between system and application software's with examples. 7M

   b) List and explain various symbols used in flowcharts with figures 7M

OR

2. a) Discuss about different computer languages with examples. 7M

   b) Explain in detail about the software development method. 7M

UNIT–II

3. a) What are bitwise logical operators? Explain about bitwise logical operators with suitable programming example. 7M

   b) Evaluate the following expressions:
   (i) a*(3+b)/2-c++ *b where a=3,b=4 and c=5 (ii) !(4+5*0>=6-4) 7M

OR

4. a) What is the need of explicit type conversion in C? How to cast the data? 7M

   b) What is the need of escape sequence? Write a sample program to illustrate escape sequences. 7M

UNIT–III

5. a) Give the control flow diagram of the *for loop*. How is the execution of 'for' loop proceeds? 7M

   b) Write a C program to find biggest of three integer numbers. 7M

OR

6. a) Explain counter-controlled and **c**ondition-controlled loops with examples. 7M

   b) Write a C program to find the sum of first and last digit of a number 7M

UNIT–IV

7. a) What are the different types of arrays in C? Explain with a suitable example, array declaration, initialization and accessing of the elements for these different types. 7M

   b) Write a C program to accept 3x3 matrix and display elements of the matrix. 7M

OR

8. a) Explain any five string manipulation functions with example 10M

   b) Write a program to find highest and smallest number in the given array. 4M

UNIT–V

9. a) Write a C program to exchange the value of two integers using call by reference. 7M

   b) Write a c program to find factorial of a number using recursive function 7M

OR

10. a) Define scope. Briefly explain the scope, life time and visibility of Identifier. 7M

    b) Explain about pre-processor commands with examples. 7M

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Hall Ticket Number :										

R-17

Code: 7GC14

I B.Tech. I Semester Supplementary Examinations March/April 2023

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. Define the rank of the matrix and find the rank of the following matrix
$$\begin{bmatrix} 2 & 1 & 3 & 5 \\ 4 & 2 & 1 & 3 \\ 8 & 4 & 7 & 13 \\ 8 & 4 & -3 & -1 \end{bmatrix}$$

OR

2. Investigate the values of ª *and* « so that the equations 2x+3y+5z=9, 7x+3y-2z=8, 2x+3y+ ªz = « , have (i) no solution, (ii) a unique solution and (iii) an infinite number of solutions.

UNIT–II

3. Show that the matrix
$$\begin{bmatrix} i & 0 & 0 \\ 0 & 0 & i \\ 0 & i & 0 \end{bmatrix}$$ is Skew-Hermitian and hence find eigen values

OR

4. Find the transformation that will transform $10x^2 + 2y^2 + 5z^2 + 6yz - 10zx - 4xy$ into a sum of squares

UNIT–III

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

OR

6. Solve $\left(\frac{e^{-2\sqrt{x}}}{\sqrt{x}} - \frac{y}{\sqrt{x}}\right)\frac{dx}{dy} = 1$

UNIT–IV

7. In L-C-R circuit, the charge q on a plate of a condenser is given by Solve $L\frac{d^2q}{dt^2} - \frac{dq}{dt} + \frac{q}{C} = E\sin pt$ the circuit is turned to resonance so that $\frac{p^2}{LC}$. Find the current i

OR

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

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. Verify Langrange's mean value theorem for $f(x) = \log_e x \ \ in\ [1,e]$

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Hall Ticket Number :										

R-17

Code: 7GC13

I B.Tech. I Semester Supplementary Examinations March/April 2023

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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UNIT–I

1. Define interference and derive the expression for diameter of nth Newton's ring.

OR

2. a) Recite the ruby laser for production of laser
   b) Explain any four applications of LASER.

UNIT–II

3. a) Show Bragg's law as $2d \sin \Theta = n\lambda$
   b) What is space lattice and draw Bravias lattices

OR

4. a) Draw the plane of miller indices of (111) and (121)
   b) Drive the expression for inter planar separation

UNIT–III

5. State de-Broglie hypothesis of dual nature and derive its wavelength

OR

6. a) Define conductivity and drive its equation for metals
   b) Distinguish metals, semiconductors and insulators

UNIT–IV

7. a) Brief Joshepson's effect with types
   b) Explain the diamagnetic nature of superconductors by Meissner's effect

OR

8. a) Derive Hall voltage and justify its importance
   b) Brief BCS theory and Flux quantization

UNIT–V

9. a) Brief the basic principles of nano materials
   b) Explain the synthesis of nano materials by sol-gel method

OR

10. a) classify the ferromagnetics by hysteresis property
    b) Narrate the importance of nano materials by basic principles

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