Hall Ticket Number :										

R-19

Code: 19A411T

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

Essentials 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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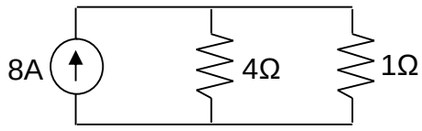
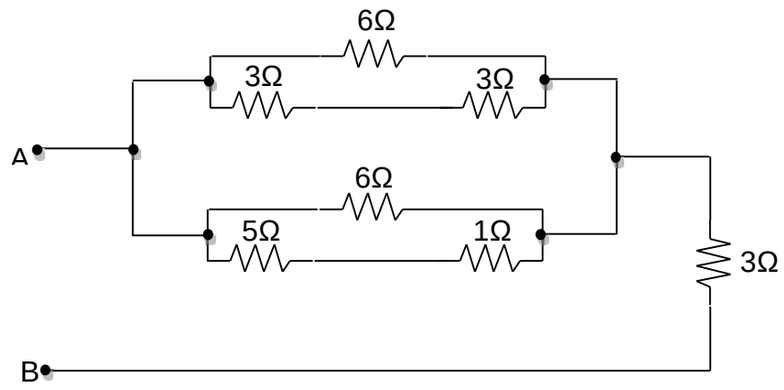
			Marks	CO	BL
		UNIT–I			
1.		What are the types of resistors? Explain any three with neat diagrams.	14M	CO1	L2
		OR			
2.	a)	Find the color codes for the resister values given below. 1) 1000Ω 2) 4700Ω 3) 10KΩ 4) 2MΩ	4M	CO1	L3
	b)	Classify the variable resistors and explain any two of them.	10M	CO1	L4
		UNIT–II			
3.	a)	Find the current through 4Ω, 1Ω resisters using current division rule. 	7M	CO2	L3
	b)	Determine the equivalent inductance when three inductors with values 6H, 4Hand 6H are connected in parallel.	7M	CO2	L3
		OR			
4.	a)	Find the equivalent resistance between A, B terminals for the network given below. 	8M	CO2	L3
	b)	State and explain Kirchhoff's laws.	6M	CO2	L2
		UNIT–III			
5.	a)	Draw and explain piece-wise linear diode characteristics	8M	CO3	L2
	b)	Define the following i) cut in voltage (Vc) ii) Static resistance iii) Dynamic Resistance	6M	CO3	L1
		OR			
6.		With neat sketch explain the principle of energy band diagram of an open circuited PN junction diode.	14M	CO3	L2
		UNIT–IV			
7.		Derive the expression for ripple factor of a Full-Wave center-tap rectifier with capacitor filter and then comment on the result.	14M	CO4	L2
		OR			
8.	a)	Derive the expressions for the following for full wave rectifier i) Average DC load current ii) Average DC load voltage iii) RMS load current	8M	CO4	L2
	b)	Compare half wave and full wave rectifiers in respect of following terms and comment on the comparisons. i) efficiency ii) Ripple factor	6M	CO4	L3
		UNIT–V			
9.	a)	Draw and explain the input and output characteristics of transistor in CB configuration.	8M	CO5	L2
	b)	Define the following i. Active region ii. Saturation region iii. Cut-off region.	6M	CO5	L1
		OR			
10.		Explain the operation of function generator with neat diagram.	14M	CO5	L2

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Hall Ticket Number :										

R-19

Code: 19A312T

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

Engineering Graphics & Design

(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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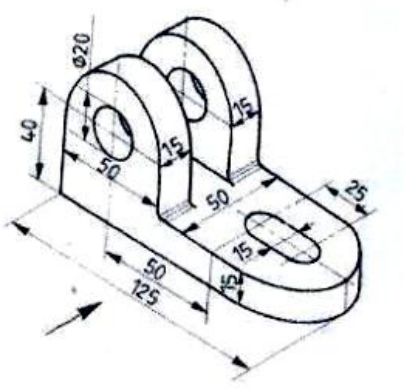
		Marks	CO	BL
	UNIT–I			
1.	The major and minor axes of an ellipse are 120mm and 80mm. Draw an ellipse by Concentric Circles method	14M	CO1	L2
	OR			
2.	Construct a parabola, when the distance of the focus from the directrix is 50mm. Also draw tangent on normal to the curve at a point 35mm from the directrix	14M	CO1	L2
	UNIT–II			
3.	Draw an involute for a square of side 25mm. Also draw a normal and tangent to the curve at a distance of 70mm from the center of square	14M	CO2	L2
	OR			
4.	Construct a cycloid having a generating circle diameter as 50mm for one revolution clockwise. Draw a normal and tangent to a curve at a point 35mm above the base line	14M	CO2	L2
	UNIT–III			
5.	A line AB, 50mm long, has its end A 20mm above the H.P and 30mm below the V.P. the line is inclined at 30^0 to the H.P and at 45^0 to the V.P. Draw the projections	14M	CO3	L3
	OR			
6.	A line AB has its end A 20mm above H.P. and 25mm in front of V.P. The other end B is 45mm above H.P. and 55mm in front of V.P. The distance between the end projectors is 60mm. Draw its projections and also find the true length and true inclination of the line with H.P and V.P	14M	CO3	L3
	UNIT–IV			
7.	A thin rectangular plate of sides of 60mm×30mm has its shortest side in the VP and inclined at 30^0 to the HP. Project its top view if its front view is a square of 30mm long sides	14M	CO4	L3
	OR			
8.	A regular hexagonal lamina of 22mm side, rests on one of its sides on HP. It is parallel to and 15mm away from the VP. The plane is vertical. Draw its projections	14M	CO4	L3
	UNIT–V			
9.	Draw the projections of a cone, base 75mm diameter and axis 100mm lying on the HP on one of its generators with the axis parallel to the VP	14M	CO5	L3
	OR			
10.	Convert the following isometric view to orthographic views 	14M	CO5	L3

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Hall Ticket Number :										

R-19

Code: 19A511T

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

Problem Solving 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 Algorithm. Explain the characteristics of algorithm. 6M
   b) What is meant by flow chart? Explain the symbols used in flowchart with an example. 8M

OR

2. a) Explain the structure of C program with an example program. 7M
   b) Discuss about C data types. 7M

UNIT–II

3. a) Explain conditional statements with an example. 8M
   b) Write a c program to find whether the given year is leap year or not. 6M

OR

4. a) What is meant by searching? Explain binary search algorithm. 7M
   b) Write a c program to print array of elements in ascending order using selection sort. 7M

UNIT–III

5. a) Define string. Explain declaration of string. Explain any three string handling functions with neat syntax and example. 8M
   b) Write C program to concatenate two strings without using strcat( ) function 6M

OR

6. a) Explain the following key words with example. i) auto ii) register iii) static iv) extern. 8M
   b) Write a c program to illustrate functions with arguments and returning value. 6M

UNIT–IV

7. a) Define pointer. Explain pointer arithmetic operations. 7M
   b) Explain call by reference with an example program. 7M

OR

8. a) Explain dynamic memory allocation functions. 7M
   b) Write a C program to demonstrate array of pointers. 7M

UNIT–V

9. a) Define structure and union. Explain the syntax and accessing elements from structure and union with an example. 8M
   b) Write a C program to maintain a record of n students with four fields (Roll no, name, marks and grade). Print the student details. 6M

OR

10. a) Define file. Write a C program to write character to a file and reading character from file. 8M
    b) Discuss about file operations. 6M

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Hall Ticket Number :										

R-19

Code: 19AC11T

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

Algebra and 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	BL

UNIT–I

1. Find the Eigen values and Eigen vectors of the matrix

$$A=\begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$$ 14M CO1 L3

OR

2. Prove that the following set of equations are consistent and solve them

$3x+3y+2z=1,\ x+2y=4,\ 10y+3z=-2,\ 2x-3y-z=5$ 14M CO1 L3

UNIT–II

3. Diagonalize the matrix $A=\begin{bmatrix} 8 & -8 & -2 \\ 4 & -3 & -2 \\ 3 & -4 & 1 \end{bmatrix}$ 14M CO2 L2

OR

4. Reduce the quadratic form $3x^2+5y^2+3z^2-2xy-2yz+2zx$ to canonical form by using orthogonal transformation. 14M CO2 L3

UNIT–III

5. a) If $z=u^2+v^2$ and $u=at^2, v=2at$, then find $\frac{dz}{dt}$ 7M CO3 L3

   b) Evaluate $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$, if $z=\log(x^2+y^2)$ 7M CO3 L3

OR

6. A rectangular box open at the top is to have volume of 32 cubic ft. Find the dimensions of the box requiring least material for its construction. 14M CO3 L3

UNIT–IV

7. Trace the curve $a^2y^2=x^2(a^2-x^2)$ 14M CO4 L4

OR

8. Using Taylor's theorem, express the polynomial $2x^3+7x^2+x-6$ in powers of $(x-1)$. 14M CO4 L3

UNIT–V

9. Evaluate $\int_0^1\int_0^1 \frac{dxdy}{\sqrt{(1-x^2)(1-y^2)}}$ 14M CO5 L3

OR

10. Evaluate $\int_0^a\int_0^{\sqrt{a^2-x^2}} y\sqrt{x^2+y^2}\,dxdy$ by changing into polar coordinates. 14M CO5 L3

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Hall Ticket Number :										

R-19

Code: 19AC12T

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

Applied 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	CO	BL
		UNIT–I			
1.	a)	Explain constructive and destructive interference of light.	4M	CO1	L2
	b)	Derive the expression for to determine wavelength of light by newton's rings method.	10M	CO1	L2
		OR			
2.	a)	Define polarization of light and mention types of polarized light.	4M	CO1	L1
	b)	Explain the construction and working of Nicol prism to produce and analyze of plane polarized light.	10M	CO1	L2
		UNIT–II			
3.		Explain various types of polarizations in dielectrics.	14M	CO2	L2
		OR			
4.	a)	Define magnetic dipole moment and intensity of magnetization.	4M	CO2	L1
	b)	Discuss the origin of magnetic momentum of an atom.	10M	CO2	L2
		UNIT–III			
5.	a)	Explain total internal reflection in optical fiber.	4M	CO3	L2
	b)	Classify the optical fibers based on the refractive index of the core material.	10M	CO3	L4
		OR			
6.	a)	Write are the applications of optical fiber.	4M	CO3	L3
	b)	Explain different types of optical fibers based on refractive index, materials and modes of propagation.	10M	CO3	L2
		UNIT–IV			
7.		Derive the expression density of charge carriers for intrinsic semiconductor.	14M	CO4	L2
		OR			
8.	a)	Define Hall effect and derive expression for Hall coefficient.	10M	CO4	L2
	b)	Mention the applications of Hall effect.	4M	CO4	L3
		UNIT–V			
9.	a)	Define superconductor and write the applications of superconductors.	6M	CO5	L3
	b)	Classify the superconductors.	8M	CO5	L2
		OR			
10.	a)	Brief the top-down and top-up approaches for synthesis of nanomaterials.	4M	CO5	L2
	b)	Explain the structure determination of nanomaterials by X-ray diffraction technique.	10M	CO5	L2

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