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Code: 19A221T

I B.Tech. II Semester Supplementary Examinations April 2023

Basic Electrical and Electronics Engineering

(Computer Science and Engineering)

Max. Marks: 70

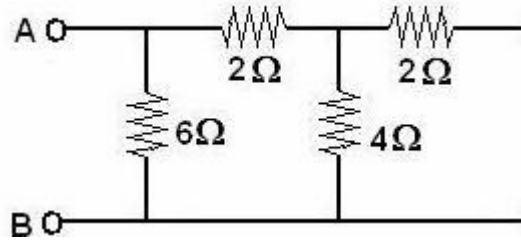
Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks CO BL

UNIT-I

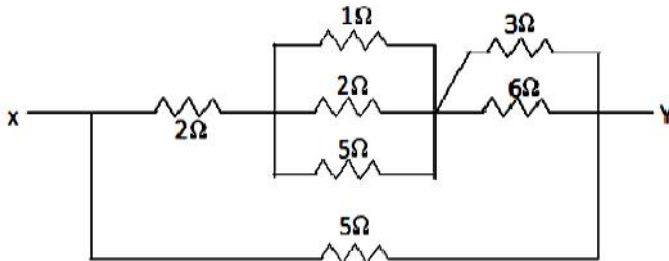
1. Determine the equivalent resistance between A and B of the network shown below.



14M CO1 L3

OR

2. a) Find the equivalent Resistance across the terminals X-Y for the circuit shown below?



8M CO1 L3

- b) Two resistances 2 and 4 are connected in series across a supply voltage of 25 Volts. Calculate voltage across each resistor

6M CO1 L3

UNIT-II

3. A 4-pole, lap wound, DC generator has a useful flux of 0.07 wb per pole. Calculate the generated emf, when it is rotated at a speed of 900 rpm with the help of prime mover. Armature consists of 440 numbers of conductors. Also calculate the generated emf. If lap wound armature is replaced by wave wound armature.

14M CO2 L3

OR

4. a) Classify and explain the different types of self-excited DC generators?
b) Derive the torque expression of a DC motor

8M CO2 L2

6M CO2 L3

UNIT-III

5. Draw the constructional diagram of an Alternator and discuss the principle of operation.

14M CO3 L3

OR

6. a) Explain the working principle of Transformer?
b) List out different types of losses present in transformer

8M CO3 L2

6M CO3 L1

UNIT-IV

7. Describe about operation of NPN transistor in terms of CE configuration with necessary diagram.

14M CO4 L1

OR

8. a) Define PNP and NPN transistors along with symbols?
b) Draw the full wave rectifier and discuss the operation of circuit.

7M CO4 L1

7M CO4 L3

UNIT-V

9. a) Explain about dielectric heating with relevant diagrams.
b) List out the applications of induction heating.

8M CO5 L2

6M CO5 L1

OR

10. a) Explain about induction heating with relevant diagrams.
b) List out the applications of Dielectric heating.

8M CO5 L2

6M CO5 L1

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R-19**Code: 19AC21T**

I B.Tech. II Semester Supplementary Examinations April 2023

Differential Equations and Vector 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)

Marks CO BL

UNIT-I

1. a) Solve $(D^2 + 5D + 6)y = e^x$ 7M CO1 L3
b) Solve $(D^2 + 4)y = \cos x$ 7M CO1 L3

OR

2. Solve $\frac{d^2y}{dx^2} + y = e^{-x} + e^x \sin x$ 14M CO1 L3

UNIT-II

3. Solve $(2x-1)^2 \frac{d^2y}{dx^2} + (2x-1) \frac{dy}{dx} - 2y = 8x^2 - 2x + 3$ 14M CO2 L3

OR

4. Solve $x^2 \frac{d^2y}{dx^2} - 4x \frac{dy}{dx} + 6y = x^2$ 14M CO2 L3

UNIT-III

5. Solve $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$ 14M CO3 L3

OR

6. a) Form the partial differential equations by eliminating arbitrary functions from $z = f(x+at) + g(x-at)$ 7M CO3 L3
b) Solve $pyz + qzx = xy$ 7M CO3 L3

UNIT-IV

7. a) Find $\text{grad } f$ where $f = x^3 + y^3 + 3xyz$ 7M CO4 L2
b) Find the directional derivative of $w = x^2 - 2y^2 + 4z^2$ at $(1,1,-1)$ in the direction of $2\bar{i} + \bar{j} - \bar{k}$. 7M CO4 L2

OR

8. Prove that $r^n \bar{r}$ is solenoidal if $n = -3$. 14M CO4 L2

UNIT-V

9. Using Green's theorem evaluate $\oint_C (2xy - x^2)dx + (x^2 + y^2)dy$, where C is the closed curve of the region bounded by $y = x^2$ and $y^2 = x$. 14M CO5 L3

OR

10. Verify stokes theorem for the function $\bar{F} = x^2\bar{i} + xy\bar{j}$ integrated around the square in the plane $z=0$ whose sides are along the lines $x=0, y=0, x=a, y=a$. 14M CO5 L3

Important Note: 1. On completing your answers. Compulsorily draw diagonal cross line on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 32+8=40, will be treated as malpractice.

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R-19

Code: 19A324T

I B.Tech. II Semester Supplementary Examinations April 2023

Engineering Graphics & Design

(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks CO BL

UNIT-I

1. Construct a regular Hexagon by General Method, given the length of its side is 50mm 14M CO1 L2

OR

2. The major and minor axes of an ellipse are 120mm and 80mm. Draw an ellipse by Concentric Circles method 14M CO1 L2

UNIT-II

3. Draw epicycloid of a circle of 40mm diameter, which rolls outside on another circle of 120mm diameter for one revolution clockwise. Draw a tangent and a normal to it at a point 95mm from the centre of the directing circle 14M CO2 L2

OR

4. A circle of diameter 30mm rolls on a flat surface without slipping. Trace the path of a point lying on its circumference for one & a half revolution of the circle. 14M CO2 L2

UNIT-III

5. 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

OR

6. A 100mm long line is parallel to and 40mm above the H.P. Its two ends are 25mm and 50mm in front of the V.P respectively. Draw its projections and find its inclination with the V.P 14M CO3 L3

UNIT-IV

7. A square ABCD of 40mm side has a corner on the HP and 20mm in front of the VP. All the sides of the squares are equally inclined to the HP and parallel to the VP. Draw its projections 14M CO4 L3

OR

8. A regular pentagon of 25mm side has one side on the ground. Its plane is inclined at 45° to the HP and perpendicular to the VP. Draw its projections 14M CO4 L3

UNIT-V

9. a) Draw the projections of a cone of base 30mm diameter and axis 50mm long, when it is resting on HP on its base 7M CO5 L3
b) Draw the projections of a cylinder of base 30mm diameter and axis 50mm long, when it is resting on HP on its base 7M CO5 L3

OR

10. 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

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R-19

Code: 19A521T

I B.Tech. II Semester Supplementary Examinations April 2023

Python Programming
(Common to CE, ME and CSE)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

Marks CO BL

UNIT-I

1. Discuss in detail about the following
a) Input error checking b) multi-way selection 14M CO1 L4
- OR**
2. a) List out arithmetic operators in python and illustrate them with examples 7M CO1 L2
b) Describe and illustrate Boolean operators with examples. 7M CO1 L2

UNIT-II

3. Justify the use of list comprehensions in Python. 14M CO2 L5
- OR**
4. a) Summarize in detail about function routine. 7M CO2 L2
b) Compare lists and tuples in Python 7M CO2 L3

UNIT-III

5. Explain the process of exception handling in detail. 14M CO3 L3
- OR**
6. a) Explain the use of modular design in software development 7M CO3 L2
b) Write a python program to write some text into a file. 7M CO3 L2

UNIT-IV

7. Determine three fundamental features of object oriented programming 14M CO4 L3
- OR**
8. a) Justify the need of automatic garbage collection in python 7M CO4 L5
b) Summarize the concept of memory allocation and de allocation. 7M CO4 L5

UNIT-V

9. Write an algorithm for Single Linked List-traversing and explain it with an example. 14M CO5 L5
- OR**
10. a) Define data structures and list out various types of data structures 7M CO5 L2
b) Discuss about the common operations performed on data structures 7M CO5 L2

Important Note: 1. On completing your answers. Compulsorily draw diagonal cross line on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8=50, will be treated as malpractice.

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R-19

Code: 19AC22T

I B.Tech. II Semester Supplementary Examinations April 2023

Applied Physics

(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

		Marks	CO	BL
UNIT-I				
1.	Describe the Fraunhofer diffraction due to single slit and derive the conditions to get maximum and minimum intensity positions.	14M	1	1
OR				
2. a)	What is interference? Mention the conditions to get interference.	6M	1	1
b)	Explain the formation of Newton's rings with experimental arrangement.	8M	1	2,3
UNIT-II				
3. a)	Explain the soft and hard magnetic materials	6M	2	2
b)	Explain the domain theory of ferromagnetism	8M	2	2
OR				
4. a)	Define the ionic polarization and derive the expression for ionic polarizability	8M	2	1,6
b)	Describe Frequency dependence of polarizability of dielectrics	6M	2	1
UNIT-III				
5.	Explain various types of optical fibers	14M	3	2
OR				
6. a)	State and prove the Gauss theorem for divergence	7M	3	1,3
b)	Derive expression for propagation of electromagnetic wave in non-conducting medium	7M	3	2
UNIT-IV				
7. a)	Describe the drift and diffusion process in a semiconductor with relevant expressions	10M	4	1
b)	The R_H of a specimen is $3.66 \times 10^{-4} \text{ m}^3 \text{c}^{-1}$. Its resistivity is $8.93 \times 10^{-3} \text{ -m}$. Find μ and n .	4M	4	3
OR				
8. a)	Explain classification of solids based on energy bands	8M	4	2
b)	Summarize applications of Semiconductors	6M	4	2
UNIT-V				
9. a)	Explain Ball-milling method to synthesis Nanomaterials	8M	5	2
b)	Explain the basic principles of Nanomaterials	6M	5	2
OR				
10. a)	Describe BCS theory of superconductivity	7M	5	2
b)	Explain the working principle of SEM with neat diagram	7M	5	2
