Hall Ticket Number :										

R-20

Code: 20A221T

I B.Tech. II Semester Supplementary Examinations June 2024

Electrical Circuits

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

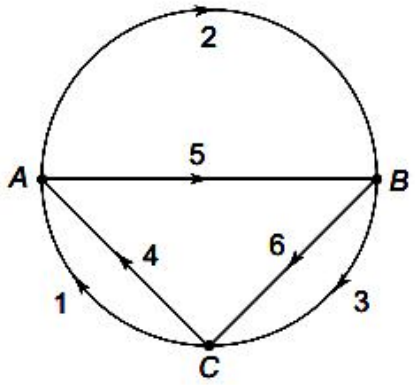
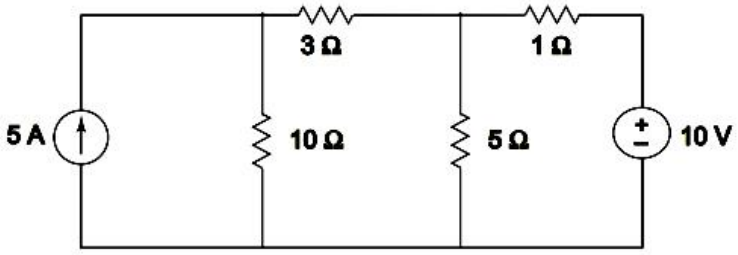
PART-A

(Compulsory question)

		CO	BL
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)		
a)	Define (i) tree (ii) Co-Tree (iii) Branch (iv) Link	1	L1
b)	Define Power factor	2	L1
c)	List the advantages of three phase AC circuits over single phase ac circuits.	3	L1
d)	State Thevenins theorem.	4	L1
e)	Explain dot convention in coupled circuit?	6	L2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT-I			
2.	For the topological graph shown in figure, obtain the fundamental Tie set matrix choosing the tree containing two elements 5 and 6. 	12M	1	L3
	OR			
3.	Determine the currents in each branch for the network shown in Fig. using Nodal analysis. 	12M	1	L3
	UNIT-II			
4. a)	Determine the average value and RMS value of a full wave rectifier sinusoidal waveform.	8M	2	L3
b)	What are the functions of operator j?	4M	2	L3

OR

5. An alternating current varying sinusoidally, with a frequency of 50 Hz has a rms value of 20 A. Write down the equation for the instantaneous value and find this value at (a) 0.0025 s, and (b) 0.0125 s after passing through a positive maximum value. 12M 2 L3

UNIT-III

6. Analyze the measurement of three phase active power using two wattmeter method? 12M 3 L4

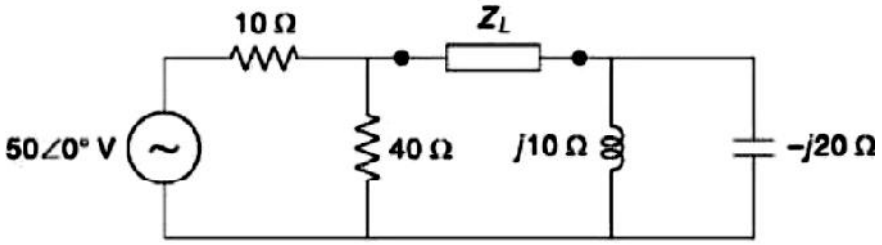
OR

7. a) Prove that $V_L=\sqrt{3}\ V_{ph}$ for star connected system 4M 3 L3

   b) Prove that $\tan\theta= \sqrt{3}(W_2-W_1)/(W_2+W_1)$ 8M 3 L3

UNIT-IV

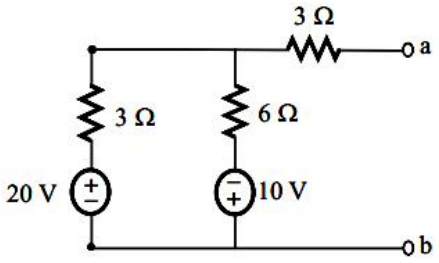
8. Determine Z_L so that maximum power is absorbed by it.



12M 4 L3

OR

9. Obtain the Thevenin and Norton equivalent circuits for the active network shown below.



12M 4 L3

UNIT-V

10. Derive the expression for coefficient of coupling in terms of self and mutual inductances of the coils. 12M 6 L2

OR

11. An iron ring of 10 cm diameter and 15 cm^2 cross section is wound with 250 turns of wire for a flux density of 1.5 Web/m^2 and permeability 500. Find the exciting current, the inductance and stored energy. Find corresponding quantities when there is a 2 mm air gap. 12M 6 L3

*** End ***

Hall Ticket Number :										

R-20

Code: 20A222T

I B.Tech. II Semester Supplementary Examinations June 2024

Fundamentals of Electronic Devices and Circuits

(Electrical and Electronics Engineering)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

			CO	BL
1.	Answer ***all*** the following short answer questions	(5 X 2 = 10M)		
	a)	Draw the symbols for pn-junction, zener diodes.	CO1	L2
	b)	List the transistor configurations	CO2	L2
	c)	What is the function of coupling capacitor C_c in Amplifier equivalent circuit?	CO3	L1
	d)	List the FET biasing circuits.	CO4	L1
	e)	List the wide band gap devices.	CO5	L1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	BL
		UNIT-I			
2.		Explain the operation of pn-junction diode with neat circuits.	12M	CO1	L2
		OR			
3.		What is voltage regulator? Explain how a zener diode act as a voltage regulator.	12M	CO1	L2
		UNIT-II			
4.		Draw CE configuration of transistor and explain it's operation.	12M	CO2	L2
		OR			
5.	a)	What is biasing? Explain it's need.	6M	CO2	L1
	b)	Define stability factors S,S',S''	6M	CO2	L1
		UNIT-III			
6.	a)	Summarize the procedural steps to draw DC equivalent circuit of amplifier.	6M	CO3	L2
	b)	Summarize the procedural steps to draw AC equivalent circuit of amplifier.	6M	CO3	L2
		OR			
7.		Compare h-parameter model of CE and CB Configurations.	12M	CO3	L5
		UNIT-IV			
8.		Analyze the fixed bias circuit of JFET. Comment on its stability.	12M	CO4	L4
		OR			
9.		Demonstrate the construction and operation of E-MOSFET with neat sketch.	12M	CO4	L3
		UNIT-V			
10.		Draw and explain the V-I characteristics of i) SCR ii) LED	12M	CO5	L3
		OR			
11.		List the applications of special purpose electronic devices.	12M	CO5	L2

*** End ***

Hall Ticket Number :										

R-20

Code: 20AC23T

I B.Tech. II Semester Supplementary Examinations June 2024

Chemistry

(Common to EEE, ECE and AI&ML)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

			CO	BL
1.	Answer ***all*** the following short answer questions	(5 X 2 = 10M)		
	a)	What are reference electrodes? Give Examples	CO1	L1
	b)	Write any two merits of hydrogen-O2 fuel cell.	CO2	L1
	c)	How will you prepare polyaniline?	CO3	L1
	d)	What are the different chromatographic separation techniques	CO4	L1
	e)	Define Molecular machines.	CO5	L1

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

			Marks	CO	BL
		UNIT-I			
2.	a)	Derive the Nernst equation for single electrode.	8M	CO1	L5
	b)	Differentiate electrochemical and electrolytic cell	4M	CO1	L2
		OR			
3.	a)	Explain the working principle of electrolytic cell	8M	CO1	L2
	b)	Calculate the standard electrode potential of Cu^{+2}/Cu, if the electrode potential at 25℃ is 0.296V when [Cu+2] = 0.015M.	4M	CO1	L3
		UNIT-II			
4.	a)	Discuss the working principle of Zn-Air battery	8M	CO2	L4
	b)	List out basic characteristics of battery	4M	CO2	L1
		OR			
5.	a)	What is primary battery? Explain its working function.	6M	CO2	L2
	b)	Explain the challenges in battery technology	6M	CO2	L2
		UNIT-III			
6.	a)	Differentiate thermosetting and thermoplastic polymers	6M	CO3	L2
	b)	List out the applications of PVC	6M	CO3	L1
		OR			
7.	a)	Distinguish between homo polymers and co polymers	6M	CO3	L4
	b)	Write short notes on functionality with examples	6M	CO3	L1
		UNIT-IV			
8.	a)	Derive an expression for beer-lamberts law	6M	CO4	L3
	b)	What are the factors effecting conductance of electrolytes	6M	CO4	L1
		OR			
9.	a)	Distinguish between IR and UV spectroscopic methods	6M	CO4	L4
	b)	Explain the instrumentation involved in IR spectroscopy	6M	CO4	L2
		UNIT-V			
10.		Discuss the mechanism involved in acid-base controlled molecular shuttle	12M	CO5	L4
		OR			
11.	a)	Describe the in and out switching with an example	6M	CO5	L2
	b)	Explain the back and forth switching mechanism with diagram	6M	CO5	L2

*** End ***

Hall Ticket Number :										

R-20

Code: 20AC25T

I B.Tech. II Semester Supplementary Examinations June 2024

Communicative English

(Common to EEE, ECE and AI&ML)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two mark.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	BL
1.	Answer ALL the following short answer questions (5 X 2 = 10M)		
a)	What do you learn from 'On the Conduct of Life?'	1	2
b)	What are the meanings of the words 'ferm' and 'bicker' in context in 'The Brook.'?	1	2
c)	How does the Prince react to the threat to his life?	1	2
d)	Is Muhammad's life impacting you?	1	2
e)	Is Mrinalini an inspiration for you? How?	1	2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT–I			
2. a)	**Choose the correct form of the noun to complete each sentence**. i. I need _____ (advice / an advice) on what to do next. ii. Would you like some more _____ (cauliflower /cauliflowers) on your plate? iii. It was a good joke and got a lot of ____ (laugh / laughs). iv. The doctor said that she was making _____ (a good progress / good progress / good progresses) and she would probably be out of hospital by next week. v. The book has _____ (exercise / exercises) at the end of every chapter. vi. There's a lot of ____ (painting / paintings) in the gallery.	6M	CO3	L4
b)	**Identify any** <u>three content</u> **and any** <u>three function</u> **words from the following passage.** 'Just days after several areas in Bengaluru were left inundated following heavy rainfall, the city was marooned once again Monday after the heavy overnight showers with complaints of flooding and traffic snarls being reported across the city. According to the India Meteorological Department (IMD), Bengaluru received 131.6 mm of rainfall, just short of breaking an eight-year-old record. On September 26, 2014, Bengaluru received 132.3 mm of rainfall.'	6M	CO3	L4

OR

3. Is the message of Hazlitt on conducting one's life is still relevant? Make a critical analysis. 12M CO1 L4

UNIT–II

4. a) Why does Tennyson say that __

'And out again I curve and flow
To join the brimming river,
For men may come and men may go,
But I go on forever.' 6M CO1 L2

b) Write a grammatical paragraph of about 100 words using cohesive devices on 'impact of Covid-19 on students.' 6M CO3 L4

OR

5. Rearrange each group of jumbled sentences below so as to have well-written paragraphs.

i. Ordinary steel contains 0.06% to 0.21 % of carbon.
ii. Stainless steel contains chromium, and the steel used in making permanent magnets contains cobalt.
iii. This small quantity of carbon turns iron, which in its pure state is soft, into hard and elastic steel.
iv. Besides these common varieties of steel, there are others designed by the metallurgist, which possess very special properties and answer very special needs.
v. By the addition of elements other than carbon, we obtain steel adapted to particular uses in technology.
vi. The term 'steel' refers to a large number of alloys of iron. 12M CO3 L4

UNIT–III

6. Explain the lines in their context.

'It seems our business can wait'
'Sire this is the finger of heaven' 12M CO1 L2

OR

7. a) **Fill in the blanks using appropriate verb form given in brackets.**

i. Where _____ (will) you be tomorrow?
ii. I _____ (learn) English since nursery.
iii. 'Please have a cup of tea.' Oh! Sorry. I have just _____(have) my breakfast.
iv. I found that my friends _____already (sleep) when I went to my hostel.
v. The call is _____ (be) recorded for quality purpose.
vi. Why are you _____ (look) at me? 6M CO3 L4

b) **Choose the appropriate one with regard to Subject-Verb agreement.**

i. One of the men _____ (is/are) not well.
ii. The team captain, as well as his players _____(is/am) anxious.
iii. Either the student or the teachers _____(is/are) in the campus.
iv. Those trousers _____(is/are) made of wool.
v. News in Telugu _____ (is/are) quite boring.
vi. All of the books, including yours,____(is/are) in the box. 6M CO3 L4

UNIT–IV

8. Has Muhammad Yunus contributed to the upward mobility of the weaker sections of the society? How? 12M CO1 L2

OR

9. Write a comparison essay on 'Are Indian products better than that of the foreign?' – 250 words. 12M CO3 L4

UNIT–V

10. a) Is 'Dancer with a white parasol' an inspiring story for you? How? 6M CO1 L2

b) Rewrite the sentences correcting the common errors.

i. I travelled on train to my native place.
ii. He was junior than me in my schooling.
iii. I prefer lemon juice than coffee.
iv. She is married with a dentist.
v. He doesn't listen me.
vi. The plane took of an hour ago. 6M

OR

11. Write a letter to your principal requesting him/her to rearrange mid examination as you missed it due to ill-health. 12M CO3 L4

*** End ***

Hall Ticket Number :										

R-20

Code: 20AC21T

I B.Tech. II Semester Supplementary Examinations June 2024

Differential Equations and Vector Calculus

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. In Part-A, each question carries **Two marks.**
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

		CO	BL
1.	Answer ***all*** the following short answer questions (5 X 2 = 10M)		
a)	Solve $(D^2+5D+6)y=0$	CO1	L3
b)	Solve $(x^2D^2+4xD+3)y=0$	CO2	L3
c)	Form the partial differential equation by eliminating the arbitrary constants from $z=ax+by$	CO3	L2
d)	Find $curl\ \bar{f}$ for $\bar{f}=z\bar{i}+x\bar{j}+y\bar{k}$	CO4	L1
e)	State Green's theorem.	CO5	L2

PART-B

Answer *five* questions by choosing one question from each unit (5 x 12 = 60 Marks)

		Marks	CO	BL
	UNIT-I			
2. a)	Solve $(D^2+6D+9)y=e^{-2x}$	6M	CO1	L3
b)	Solve $(D^2+1)y=x$	6M	CO1	L3
	OR			
3.	Solve $\frac{d^2y}{dx^2}+4y=\tan 2x$ by using method of variation of parameters.	12M	CO1	L3
	UNIT-II			
4.	Solve $(1+x)^2\frac{d^2y}{dx^2}+(1+x)\frac{dy}{dx}+y=2\sin[\log(1+x)]$	12M	CO2	L3
	OR			
5.	Solve $(x^2D^2-3xD+4)y=(1+x)^2$	12M	CO2	L3

UNIT-III

6. Form the partial differential equation by eliminating the arbitrary constants a, b from $(x-a)^2+(y-b)^2=z^2\cot^2\sim$ 12M CO3 L2

OR

7. Solve $x^2(y-z)p+y^2(z-x)q=z^2(x-y)$ 12M CO3 L3

UNIT-IV

8. Find the directional derivative of $¤=x^2-2y^2+4z^2$ at (1,1,-1) in the direction of $2\bar{i}+\bar{j}-\bar{k}.$ 12M CO4 L2

OR

9. Find $curl\ \bar{f}$ where $\bar{f}=grad(x^3+y^3+z^3-3xyz)$ 12M CO4 L2

UNIT-V

10. Evaluate the line integral

$$\int_c[(x^2+xy)dx+(x^2+y^2)dy]$$

where c is the square formed by the lines $x=\pm1 and\ y=\pm1.$ 12M CO5 L2

OR

11. Verify Stoke's theorem for the function $\bar{F}=x^2\bar{i}+xy\,\bar{j}$ integrated round the square in the plane z=0 whose sides are along the lines $x=0,y=0,x=a,y=a.$ 12M CO5 L2

*** End ***