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 ***

Hall Ticket Number :										

R-20

Code: 20A224T

I B.Tech. II Semester Supplementary Examinations June 2024

Electrical Circuits and Technology

(Electronics and Communication 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

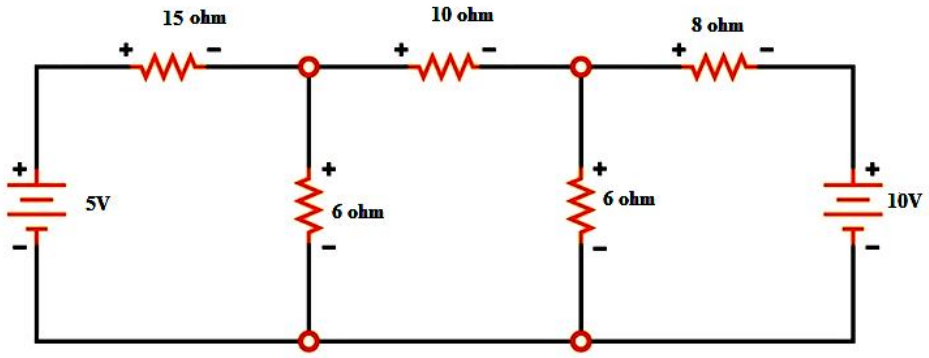
(Compulsory question)

1. Answer ***all*** the following short answer questions (5 X 2 = 10M)	CO	BL
a) Find the time constant of RL circuit having R=10 ohm and L=0.1 mH?	1	1
b) Define frequency and amplitude	2	1
c) What are the conditions for symmetry and reciprocity in terms of Y parameters	3	1
d) Outline the equivalent circuit of a single-phase transformer	4	2
e) What is the function of a transformer?	5	1

PART-B

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

			Marks	CO	BL
		UNIT-I			
2.	a)	Explain the super node and super mesh concepts?	6M	1	2
	b)	Find the currents in all branches of the network shown in figure by mesh method?	6M	1	3



OR

3.		A series RLC circuit with R=10 Ω, L=0.1 H and C=20 μF has a constant voltage of 100 Volts applied at time t=0. Determine the transient current i(t).	12M	1	2
		UNIT-II			
4.	a)	Develop the expression for the resonant frequency of RLC series circuit?	6M	2	3
	b)	A series RLC circuit has a bandwidth of 600 HZ. The quality factor is 10. If the value of L is 0.01H. Find the value of C?	6M	2	4

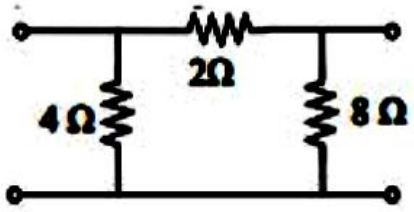
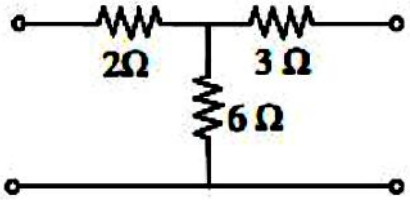
OR

5.	a)	Derive an expression for average and RMS value of a sinusoidal varying quantity	6M	2	1
	b)	A series RLC circuit consists of a resistance of 25 Ω, inductance 0.4 H, capacitance of 250 μF is connected a supply of 230V, 50 Hz. Find the total impedance, current, power, power factor, voltage across coil and capacitance.	6M	2	3

UNIT-III

6.	a)	Explain the Z parameters of the two port network?	6M	3	2
	b)	A two port network is described by the following equations V1= 50 I_1 + 25 I_2 V2 = 25I_1+ 30 I_2 Find the ABCD parameters?	6M	3	3

OR

7.	a)	Obtain y parameters of the network shown in below figure. 	6M	3	3
	b)	Find the Z parameters of the network shown in Figure 	6M	3	3

UNIT-IV

8.	a)	Explain the principle of operation of a DC motor?	6M	4	2
	b)	Develop the expression for EMF equation of DC generator?	6M	4	2

OR

9.	a)	Explain the operation and Characteristics of DC Shunt Motor	6M	4	2
	b)	Explain the speed control methods of DC motor	6M	4	2

UNIT-V

10.	a)	From first principles, derive the EMF equation of a transformer?	6M	5	2
	b)	Describe the neat sketch, the constructional details of a single phase transformer?	6M	5	2

OR

11.	a)	Explain the principle of operation of a transformer	6M	4	2
	b)	Explain the different tests that are conducted on Transformer?	6M	4	2

*** End ***

Hall Ticket Number :										

R-20

Code: 20A421T

I B.Tech. II Semester Supplementary Examinations June 2024

Electronic Devices and Circuits

(Electronics and Communication 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)

1. Answer ***all*** the following short answer questions (5 X 2 = 10M)	CO	BL
a) Define operating point	CO1	L1
b) Draw the symbol of Enhancement MOSFET of N and P Channel	CO2	L1
c) Compare input impedance and output impedance in CE and CB configurations	CO3	L2
d) What is pinch-off voltage? Give its expression	CO4	L2
e) Compare the LCD and LED	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.		Give an outline about thermal runaway and derive the expression for thermal stability	12M	CO1	L4
		OR			
3.	a)	Write a short notes on importance of heat sinks	6M	CO1	L1
	b)	A voltage divider bias circuit has Vcc=15v, Rc=2.7KΩ, Re=2.2kΩ, R_1=22KΩ, R_2=12KΩ. calculate V_{BE}	6M	CO1	L3
		UNIT-II			
4.		Explain the constructional features of Enhancement mode MOSFET and explain its basic operation.	12M	CO2	L2
		OR			
5.		Explain the construction, operation and characteristic behavior of JFET under various biasing conditions.	12M	CO2	L4
		UNIT-III			
6.		Deduce the expressions for current gain, voltage gain, input impedance and output impedance of CB amplifier using H-parameter model	12M	CO3	L4
		OR			
7.	a)	Compare between Class-A, Class-B and Class-C amplifiers.	6M	CO3	L2
	b)	What are h-parameters, explain how they can be determined from BJT characteristics.	6M	CO3	L2
		UNIT-IV			
8.		Draw the circuit of source follower Amplifier and derive the expressions for AI, AV, Ri and Ro.	12M	CO4	L4
		OR			
9.		How does the constructional feature of a MOSFET differ from a JFET	12M	CO4	L4
		UNIT-V			
10.	a)	Explain the operation of photo diode	6M	CO5	L2
	b)	Explain the operation of LED	6M	CO5	L2
		OR			
11.		Define tunneling phenomenon. Explain how tunnel diode operates under different operating conditions. In what way it is different from conventional diodes, give the necessary energy level diagrams	12M	CO5	L4

*** 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 ***