O.P.Code:20EE0251	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
BASIC ELECTRICAL & ELECTRONICS ENGINEERING
(Mechanical Engineering)

***Note:** Answer **PART-A** from pages **2 to 20** and **PART-B from 21 to 39.**

Time: 3 Hours **Max. Marks: 60**

(Answer all Six Units **6 X 10 = 60** Marks)

PART-A

UNIT-I

1	a	Explain Basic circuit components in detail.	CO1	L2	5M
	b	Define independent source and dependent source what are the types of dependent sources.	CO1	L2	5M

OR

2	a	Write the derivation of Average value of Alternating voltage and currents.	CO1	L2	5M
	b	Determine the current in all resistors in the circuit as shown in figure 1.	CO1	L2	5M

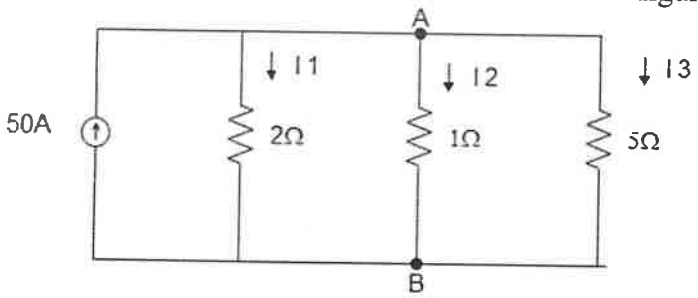
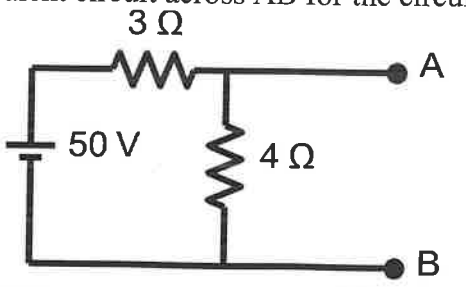


Figure 1

UNIT-II

3	a	State Norton's theorem.	CO2	L1	2M
	b	Find Norton's equivalent circuit across AB for the circuit shown.	CO2	L3	8M



OR

4	a	Derive the EMF equation of a DC Generator	CO2	L4	5M
	b	A 4-pole lap wound dc generator has a useful flux of 0.07wb per pole Calculate the generated emf when it is rotated at speed of 900rpm with the help of prime mover. Armature consists of 440 number of conductors calculate the generated emf, if lap wound is replaced by wave wound?	CO2	L4	5M

UNIT-III

5	a	Discuss about the principle of operation of DC motors	CO3	L5	5M
	b	Calculate the value of torque established by the armature of a 4-pole DC motor having 774 conductors, 2 paths in parallel, 24mwb flux per pole when the total armature current is 50A.	CO3	L5	5M

OR

6	a	Derive the condition for maximum efficiency of the transformer.	CO3	L3	5M
	b	Discuss about the voltage regulation of the transformer	CO3	L3	5M

PART-B

UNIT-IV

7	a	With a neat circuit diagram, explain the operation of a full wave rectifier.	CO6	L2	5M
	b	Define 'Ripple Factor' and derive an expression for ripple factor of a full wave rectifier.	CO5	L1	5M

OR

8	a	Draw and explain the V-I characteristics of Zener diode.	CO5	L1	5M
	b	Show that the Zener diode can be used as a Voltage regulator with neat diagram.	CO5	L1	5M

UNIT-V

9	a	Explain the construction of an NPN transistor and give the circuit symbols for NPN and PNP transistors.	CO5	L2	5M
	b	If the base current in a transi. is 20μA when the emitter current is 6.4mA, what are the values of and β? Also calculate the collector Current.	CO6	L4	5M

OR

10	a	For a transistor, the leakage current is 0.1μA in CB configuration, While it is 19μA in CE configuration. Find α & β of the same transistor?	CO5	L3	5M
	b	Compare Transistor configurations.	CO6	L4	5M

UNIT-VI

11	a	Explain the construction and working principle of P-channel JFET.	CO6	L2	5M
	b	Sketch the Drain characteristics of N-channel JFET and explain it.	CO5	L3	5M

OR

12	a	With a neat diagram deduct, the CG configuration of JFET.	CO5	L5	5M
	b	An N channel JFET as IDSS =8mA and Vp =-5v. Determine the minimum value of VDS for pinch off region and the drain current IDS, for VGS =-2v in pinch off region.	CO6	L3	5M

*** END ***

O.P.Code: 20CS0501	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
C PROGRAMMING AND DATA STRUCTURES
(Common To CE, AGE, CSE, CSIT, CSM, CIC, CAD, CCC & CAI)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Define a variable. Write the variable declaration. What are the rules for declaring a variable?	CO1	L2	6M
	b	Explain about data types in C.	CO1	L2	6M

OR

2	a	Mention the different looping statements with syntax in C.	CO2	L2	4M
	b	Discuss the below looping statements with example i. While Loop ii. For loop	CO1	L2	8M

UNIT-II

3	a	Distinguish between call by value and call by reference with an example programs.	CO3	L4	6M
	b	How to use Array as Function argument? Explain with an example program.	CO3	L2	6M

OR

4	a	Examine the types of storage class available in C.	CO3	L5	6M
	b	Describe about type qualifiers used in C.	CO2	L2	6M

UNIT-III

5	a	Explain the concept of array of pointers with examples.	CO3	L2	8M
	b	What are the features of pointers? Write a C program to print address of a variable.	CO3	L6	4M

OR

6	a	Explain about Enumerated data type.	CO3	L2	6M
	b	Define union and give the general syntax for union. Write a suitable example.	CO4	L3	6M

UNIT-IV

7	a	What is data structure? Explain types of data structures.	CO5	L1	6M
	b	What is a stack? Write the representation of stacks.	CO5	L1	6M

OR

8		Explain briefly about circular linked list and circular double linked list with suitable example.	CO6	L2	12M

UNIT-V

9		What do you mean by Searching? Explain sequential search and binary search with suitable example.	CO6	L1	12M

OR

10	a	Explain selection sort. Sort the following numbers using selection sort : 24,9,29,14,19,27,50,10,30	CO6	L5	6M
	b	Sort the following numbers using selection sort : 45,25,10,2,9,85,102,1	CO6	L5	6M

*** END ***

O.P.Code: 20ME0353	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
THERMAL AND FLUID ENGINEERING
(Electrical & Electronics Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		What is need of Chimney in thermal power plant and explain their types?	CO1	L1	12M
		OR			
2	a	Define property. Distinguish between intensive property and extensive property with example.	CO2	L1& L2	6M
	b	Explain following terms state, path, process and cycle.	CO2	L2	6M

UNIT-II

3		Draw and explain a P.V, P-T and T-S diagram for a pure substance.	CO2	L2	12M
		OR			
4	a	Explain the feed pump and economizer.	CO2	L2	6M
	b	What is the difference between super heater and air pre heater?Explain in detail with diagrams.	CO2	L2	6M

UNIT-III

5	a	Define compressibility and specific weight and write their units.	CO4	L1	6M
	b	Write a short note on Piezometer with neat sketch.	CO5	L2	6M
		OR			
6		Explain with neat sketch Bourdon tube pressure gauge.	CO5	L2	12M

UNIT-IV

7		Develop an expression for Discharge measurement by orifice meter.	CO5	L3	12M
		OR			
8		Enlist the major and minor loses in pipes. Derive the expression for loss of head due to sudden contraction.	CO5	L3	12M

UNIT-V

9	a	Derive an expression for the force exerted by a jet on fixed vertical flat plate.	CO5	L3	6M
	b	A jet of water 50mm strikes a flat stationary plate normally with a velocity of 30 m/s.Find the force experienced by the plate.	CO6	L5	6M
		OR			
10		Draw the neat sketch of Kaplan turbine and explain its working.	CO6	L1	12M

***** END *****

O.P.Code: 20EE0253	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
PRINCIPLES OF ELECTRICAL CIRCUITS
(Electronics & Communications Engineering)

Time: 3 Hours **Max. Marks: 60**

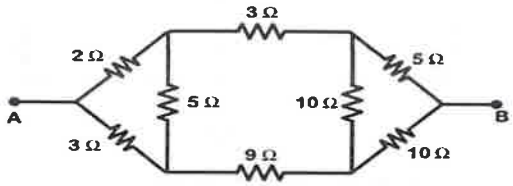
(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Explain in detail about delta to star transformation of a resistive network.	CO1	L3	6M
	b	Explain in detail about R,L, and C elements with voltage and current equation.	CO1	L2	6M

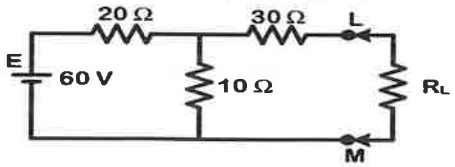
OR

2		Find the voltage to be applied across AB in order to drive a current of 5A into the circuit.	CO1	L3	12M



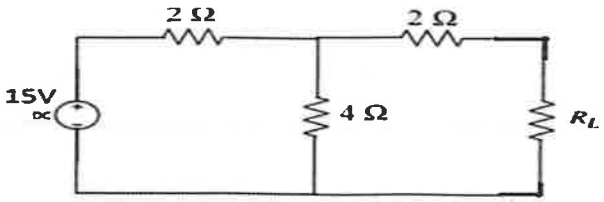
UNIT-II

3	a	State and prove Maximum Power Transfer Theorem.	CO3	L3	6M
	b	Determine the Maximum Power delivered to the load resistance R_L.	CO3	L3	6M



OR

4	a	State &explain Thevenin's Theorem.	CO3	L1	6M
	b	Find load current by using Thevenin's theorem for the following circuit where RL =3Ω.	CO3	L3	6M



UNIT-III

5		A series RL circuit with R=30Ω and L=15H has a constant voltage V=60v applied at t=0. Determine the current "I", voltage across resistor and voltage across inductor.	CO4	L4	12M

OR

6		The Circuit Consists Of Resistance = 20 Ohm, Inductance = 0.05H, Capacitance = 20uF in Series With a 100V Constant at t=0. Find The Current Transient.	CO4	L2	12M

UNIT-IV

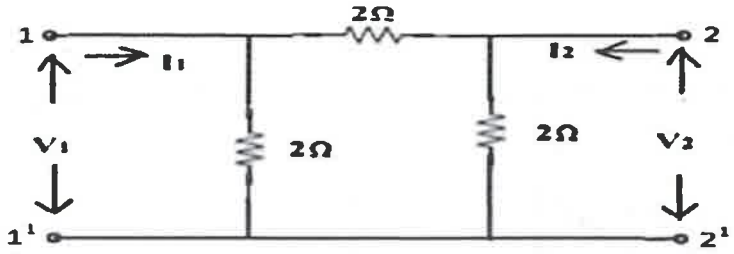
7	a	Derive an expression for RMS values of sine wave form.	CO5	L2	8M
	b	Define power factor and form factor.	CO5	L2	4M

OR

8	a	An alternating current is expressed as I = 14.14 sin 314t. Determine: **(i)** Maximum current **(ii)** RMS current **(iii)** Frequency **(iv)**Instantaneous current when t = 0.02msec.	CO5	L2	8M
	b	Define active power and reactive power.	CO5	L4	4M

UNIT-V

9	a	Explain about ABCD-parameters.	CO6	L2	6M
	b	Find the transmission parameters for the circuit shown in figure.	CO6	L2	6M



OR

10		Explain about Constant-K High-pass filter in detail.	CO6	L2	12M

***** END *****

Q.P. Code: 20ME0351 **R20**

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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
BASIC ELECTRICAL & MECHANICAL ENGINEERING
(Common to CE & AGE)

Time: **3 hours** Max. Marks: **60**

***Note:** Answer **PART-A** from pages **2 to 20** and **PART-B** from **21 to 39.**

(Answer all Six Units **6 X 10 = 60** Marks)

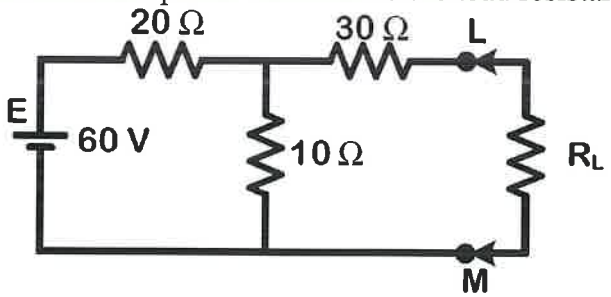
PART-A

UNIT-I

1	a	State and prove Kirchhoff's laws with suitable examples.	CO1	L2	5M
	b	Explain in detail about passive elements.	CO1	L3	5M
		OR			
2		Explain in detail about (i) RMS value (ii) Average value (iii) Form factor (iv) Peak factor (v) Prove that the form factor of the sinusoidal wave is 1.11.	CO1	L3	10M

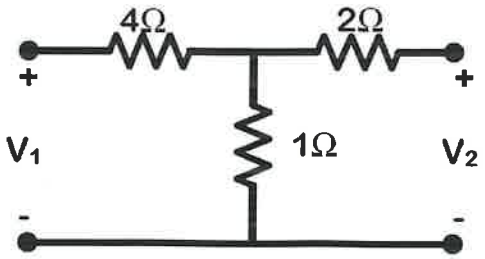
UNIT-II

3	a	State Thevenin's theorem.	CO2	L2	3M
	b	Determine the maximum power delivered to the load resistance R_L	CO2	L3	7M



OR

4	a	Find the Short circuit parameters for the given circuit.	CO2	L4	5M



	b	The given Y-parameters are Y_{11}=0.5, Y_{12}=Y_{21}=0.6, Y_{22}=0.9. Find the Impedance parameters.	CO2	L3	5M

UNIT-III

5	a	Explain constructional details of transformer.	CO3	L3	5M
	b	A 6 pole lap wound shunt motor has 500 conductors, the armature and shunt field resistances are 0.05 Ω and 25 Ω, respectively. Find the speed of the motor if it takes 120 A from dc supply of 100 V. Flux per pole is 20 mWb.	CO3	L4	5M
		OR			
6	a	Derive Torque equation of DC motor.	CO3	L3	5M
	b	A 100 kVA, 11000/400 V, 50 Hz transformer has 40 secondary turns. Calculate the number of primary turns and primary and secondary currents.	CO3	L4	5M

PART-B

UNIT-IV

7		Sketch and explain the Centrifugal casting with advantages, limitations and applications.	CO4	L3	10M
		OR			
8		What is meant by welding? Elaborate the working of gas welding with neat sketch and mention the advantages, limitations and applications.	CO4	L2	10M

UNIT-V

9		What is planer? Explain its working principle with a neat diagram.	CO5	L2	10M
		OR			
10		What is CNC? Explain the working of CNC machine with block diagram.	CO5	L2	10M

UNIT-VI

11		How do you classify refrigeration systems? Explain the working of vapour compression refrigeration system with a neat diagram.	CO6	L2	10M
		OR			
12	a	Mention the applications of refrigeration system	CO6	L1	5M
	b	List out the various factors involved in the installation of an air conditioning system.	CO6	L1	5M

*** END ***

Q.P.Code: 20HS0810 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
COMMUNICATIVE ENGLISH
(Common to ECE, EEE & ME)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Describe the central theme of the story "Half a Rupee Worth."	CO1	L2	6M
	b	**Fill in the blanks with the correct form of verb given in the brackets.** i. John always _____ (go) for a walk. ii. They_____ (buy) a new car yesterday. iii. Look! The birds _____(fly) iv. She _____ (do) this work just now. v. The children ____ (play) Cricket for three hours. vi. We____ (be) Indians.	CO1	L1	6M

OR

2	a	Prepare a short note on Positive Attitude.	CO1	L3	6M
	b	Describe content words with suitable examples.	CO1	L1	6M

UNIT-II

3	a	What happened when the Thakur's door opened suddenly?	CO2	L1	6M
	b	Discuss rapid reading techniques.	CO2	L2	6M

OR

4	a	What is the central theme of the story "The Thakur`s Well."	CO2	L1	6M
	b	Explain Simple, Compound and Complex sentences with examples	CO2	L2	6M

UNIT-III

5	a	How does the poem "I am not that Woman" bring out the hidden potential and rebellion spirit of the speaker?	CO3	L2	6M
	b	What are the steps involved in summarizing?	CO3	L1	6M

OR

6	a	Make a report (letter format) to the Municipal Commissioner on the poor sanitation in your locality.	CO3	L3	6M
	b	Who is the role model in your life and how did you get motivated by him/her?	CO4	L1	6M

UNIT-IV

7	a	Elucidate the changes in Mrs. Murthy at the beginning and at the ending of the story "What is My Name?"	CO5	L2	6M
	b	**Correct the following with appropriate adjective forms.** i) This summer is hottest than the previous summer. ii) Hemasai is the more intelligent boy in the class. iii) Her doll is pretty than yours. iv) Prevention is best than cure. v) He is the good friend I have. vi) Iron is useful than any other metal.	CO5	L4	6M

OR

8	a	Write a paragraph on comparing and contrasting humans with robots.	CO5	L4	6M
	b	Write twelve meaningful sentences using positive, comparative and superlative degrees.	CO5	L2	6M

UNIT-V

9	a	Give an account on the reminiscences of Kalam's childhood at Rameswaram in the essay "The Power of Prayer"?	CO6	L2	6M
	b	**Fill in the blanks with suitable articles.** i) He is not _____ honorable man. ii) Mount Everest is _____highest peak in the world. iii) Sanskrit is _____ difficult language. iv) Raju is _____ university professor. v) He's working in _____ garden. vi) Tom is _____ player in our team	CO6	L1	6M

OR

10	a	Write a short note on Short term and Long term goals.	CO6	L2	6M
	b	Explain in detail about superficial listening and attentive listening.	CO6	L2	6M

***** END *****

O.P.Code: 20EE0250	R20	H.T.No.									

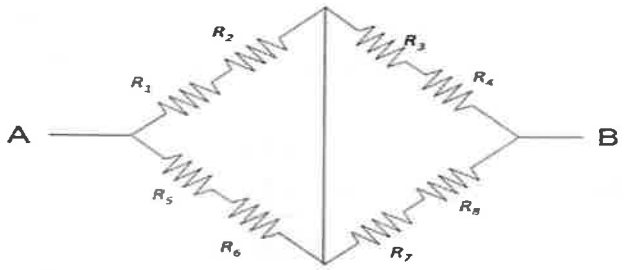
SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
PRINCIPLES OF ELECTRICAL ENGINEERING
(Common to CSE, CSIT, CAD, CAI, CSM, CCC & CIC)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

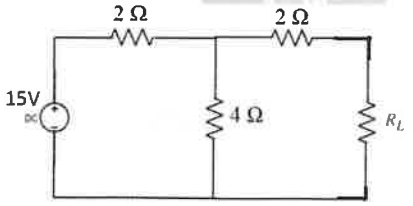
UNIT-I

1	a	Explain about Electrical circuit elements.	CO1	L1	6M
	b	Find the equivalent resistance between AB for the circuit shown below R1=4Ω, R2=2Ω, R3=8Ω, R4=1Ω, R5=12Ω, R6=3Ω, R7=10Ω & R8=5Ω.	CO1	L2	6M



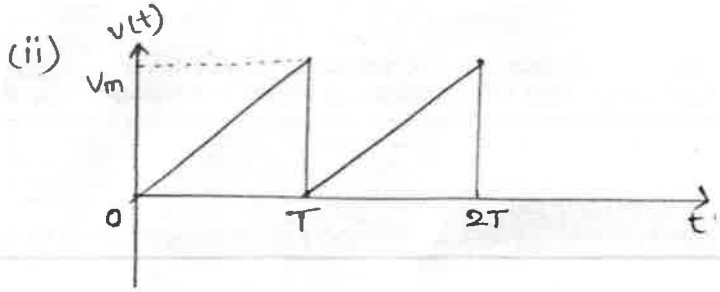
OR

2	a	State and explain superposition theorem with an example.	CO2	L2	6M
	b	Find load current by using Thevenin's theorem for the following circuit where RL=3Ω.	CO2	L2	6M



UNIT-II

3	a	Derive an expression for RMS value of sine wave form.	CO3	L2	6M
	b	Find the rms value for the following waveform.	CO3	L2	6M



OR

4	a	Derive an expression for the current and impedance for a series RC circuit excited by a Sinusoidally alternating voltage. Draw the phasor diagrams.	CO3	L3	6M
	b	A series RLC circuit of R=40 Ω, L= 50.07mH and a capacitor is connected across a 400V,50Hz, A.C supply. This RLC combination draws a current of 10A.Calculate Power factor of the circuit and Capacitor value.	CO3	L3	6M

UNIT-III

5	a	Explain OCC Characteristics of DC generator.	CO4	L2	6M
	b	The armature of a 6-pole,wave wound D.C generator has 604 conductors. Calculate the generated EMF when the flux per pole is 60mWb and the speed is 250rpm.At what speed, the armature to be driven in order to generate an EMF of 550V,if the flux per pole is reduced to 58mWb.	CO4	L3	6M
		OR			
6		Explain the working operation of a DC Motor in detail.	CO4	L2	12M

UNIT-IV

7	a	Derive an EMF equation of a single-phase transformer.	CO5	L2	6M
	b	A single-phase transformer has 400 turns on primary winding 1000 turns on secondary winding. If it is operating at 50Hz supply with a maximum flux of 0.045Wb.Find (i) Primary &Secondary induced EMF (ii) EMF induced per turn.	CO5	L3	6M
		OR			
8		Explain Working Principle of 3-Ø Induction Motor in detail.	CO5	L2	12M

UNIT-V

9		Explain operating principle of Permanent Magnet Moving Coil (PMMC) instruments.	CO6	L2	12M
		OR			
10		Explain construction and operating principle of Moving Coil Ammeter in detail.	CO6	L2	12M

***** END *****

O.P.Code:23HS0810	R23	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech. I Year I Semester Regular Examinations July/August-2024

COMMUNICATIVE ENGLISH

(Common to CE, ME, CSM, CIC, CAD, CCC & CAI)

Time: 3 Hours **Max. Marks: 70**

PART-A

(Answer all the Questions **10 x 2 = 20** Marks)

1	a	Della bought a gift to Jim. (Identify the subject, predicate in the sentence)	CO1	L1	2M
	b	What is the affix of —independent‖?	CO1	L2	2M
	c	What are cohesive devices?	CO2	L1	2M
	d	Write about the structure of a paragraph.	CO2	L2	2M
	e	Explain the general strategies of Reading Comprehension?	CO3	L2	2M
	f	Describe your daily routine in four sentences.	CO3	L1	2M
	g	Change the following sentences from active voice to passive voice. i) Ram played hockey. ii) Children like sweets.	CO4	L3	2M
	h	What are the main parts of a formal letter?	CO4	L6	2M
	i	Write any two factors for effective reading.	CO5	L2	2M
	j	**Fill in the blanks with appropriate prepositions** The scientist looked ____ the microscope. (through/in) I will have completed my task __ Friday. (till/by)	CO5	L2	2M

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Explain the central theme of the essay —The Gift of the Magi‖	CO1	L1	5M
	b	Characteristic sketch of Della.	CO1	L3	5M
		OR			
3	a	What is difference between Scanning and Skimming?	CO1	L1	5M
	b	Write any five capitalization rules with examples.	CO1	L4	5M

UNIT-II

4	a	How is The Brook a symbol of human life?	CO2	L1	5M
	b	Describe paragraph writing.	CO2	L3	5M
		OR			
5	a	Define Homonym sand Homophones with examples?	CO2	L1	5M
	b	Fill in the blanks with suitable Cohesive Devices. (while, besides, before, and, though, whereas) 1. ---------- he worked hard, he failed. 2. Raju celebrated his birthday on 10th of December ---------- Mohan celebrated his birthday on 12th of December. 3. ---------- he is an English teacher, he can speak Telugu. 4. ---------- he was going to market, he met his old friend. 5. He is planning to meet the minister---------- the chief secretary.	CO2	L2	5M

UNIT-III

6	a	Who is Elon Musk write a short note?	CO3	L2	5M
	b	List out the steps involved in summarizing a text.	CO3	L2	5M

OR

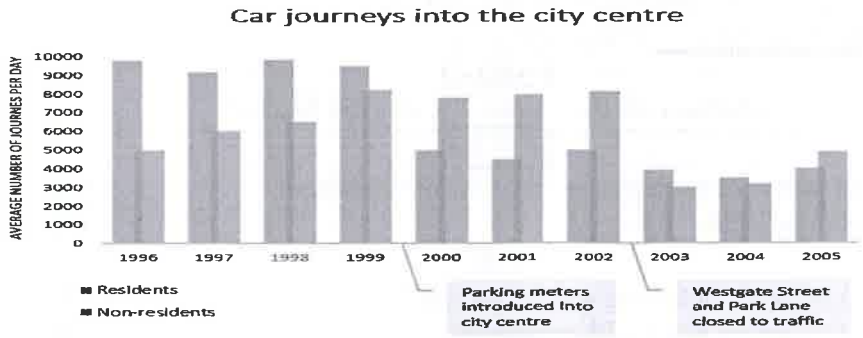
7	a	Summarize the text given below: There are times when the night sky glows with bands of color. The bands may begin as cloud shapes and then spread into a great arc across the entire sky. They may fall in folds like a curtain drawn across the heavens. The lights usually grow brighter, then suddenly dim. During this time the sky glows with pale yellow, pink, green, violet, blue, and red. These lights are called the Aurora Borealis. Some people call them the Northern Lights. Scientists have been watching them for hundreds of years. They are not quite sure what causes them. In ancient time.	CO3	L4	5M
	b	Elucidate note-making, its methods and systems.	CO3	L4	5M

UNIT-IV

8	a	Studying historic battles and playing war games go hand in hand. Did it influence the boys? Explain.	CO4	L5	5M
	b	Imagine that you are applying for WIPRO. In this regard prepare your RESUME with all the essential details.	CO6	L6	5M

OR

9	a	Convert the given Bar Graph into a paragraph.	CO4	L4	5M



	b	Write a Resume to apply for the job you dream of today.	CO6	L2	5M

UNIT-V

10	a	Write an essay on Wonders of Science.	CO5	L1	5M
	b	What are the characteristics of an essay?	CO5	L1	5M

OR

11	a	What is jargon and write 2 examples for jargon?	CO5	L2	5M
	b	Write an essay on 'Engineering education in nation building'.	CO5	L2	5M

***** END *****

O.P.Code: 20CE0101	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
ENGINEERING MATERIALS
(Civil Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12** = **60** Marks)

UNIT-I

1		List the types of defects in clay bricks. Explain briefly on each defect.	CO1	L1	12M
		OR			
2		Write short notes on: i) Types of tiles and their uses. ii) Mention the manufacturing methods of tiles. ii) Characteristics of good tiles.	CO1	L3	12M

UNIT-II

3	a	Define water-cement ratio. How does it influence concrete strength?	CO2	L2	6M
	b	State the functions of ingredients in mortar.	CO2	L2	6M
		OR			
4	a	List the properties of cement. Explain any five properties.	CO2	L2	6M
	b	Write short notes on:Compression Strength of Concrete.	CO2	L2	6M

UNIT-III

5	a	Explain the damage caused by insects to wood.	CO3	L3	8M
	b	Explain the procedure to prepare the oil paint.	CO3	L2	4M
		OR			
6	a	Discuss the reasons for the causes of defects in painting work.	CO3	L3	6M
	b	Distinguish between softwood and hard wood.	CO3	L2	6M

UNIT-IV

7		Explain any five rolled steel sections with neat sketches.	CO4	L3	12M
		OR			
8		What are smart materials? Explain their applications in civil engineering field?	CO4	L2	12M

UNIT-V

9	a	Explain mechanical properties of coarse aggregates.	CO5	L2	6M
	b	Discuss the characteristics of good aggregates.	CO5	L2	6M
		OR			
10	a	Write short notes on M sand.	CO5	L2	6M
	b	What arc thc various types of bitumen and what are their uses.	CO5	L2	6M

***** END *****

O.P.Code: 20EC0445	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
BASIC ELECTRONICS ENGINEERING
(Common to CSE,CSM, CAD,CAI,CCC,CSIT & CIC)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Describe the energy band diagrams.	CO1	L2	6M
	b	What is meant by doping in semiconductors? What is the need for doping?	CO1	L2	6M
		OR			
2	a	Explain the following terms and give an example for each: (i) Conductors (ii) Semiconductors.	CO5	L3	6M
	b	Explain drift current with expressions.	CO4	L2	6M

UNIT-II

3	a	Describe Transition and Diffusion capacitances of a PN junction Diode with expressions.	CO1	L3	6M
	b	Calculate the forward resistance of a PN junction diode when the forward current is 5mA at T = 300 K. Assume Silicon diode.	CO2	L4	6M
		OR			
4	a	Draw the ideal diode characteristics of PN junction diode and its electrical equivalent model.	CO4	L4	6M
	b	Discuss the Diode Resistances.	CO4	L2	6M

UNIT-III

5		Explain the working principle of rectifiers with and without capacitors.	CO3	L3	12M
		OR			
6	a	Determine the ripple factor for both half wave and full wave rectifier.	CO2	L4	6M
	b	Explain the construction and working principle of CLC or π section filter along with derivation for its ripple factor.	CO3	L3	6M

UNIT-IV

7	a	Derive the relation between α, β and Υ of a Transistor.	CO2	L4	6M
	b	With a neat diagram, Explain how a transistor acts as an amplifier.	CO6	L2	6M
		OR			
8	a	Interpret Diode Compensation Technique for the parameters V_{BE} and I_{CO}.	CO5	L3	6M
	b	Explain the operation of self-bias circuit of BJT and its advantages.	CO2	L2	6M

UNIT-V

9	a	Explain construction and working principle of E-only MOSFET.	CO4	L2	6M
	b	Compare the performance of BJT with JFET.	CO5	L4	6M
		OR			
10	a	Sketch the transfer characteristics of P-channel JFET.	CO1	L2	6M
	b	Explain voltage divider bias of JFET with neat circuit diagram.	CO2	L2	6M

***** END *****

O.P.Code: 20ME0303	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
BASIC THERMODYNAMICS
(Agricultural Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		Define the following with their units a) Pressure b) volume c) Temperature d) Enthalpy e) Internal energy f) Density	CO1	L1	12M
2		What is meant by thermodynamic equilibrium? Explain its types briefly.	CO1	L1& L2	12M

UNIT-II

3	a	Compare heat pump and a refrigerator.	CO2	L5	6M
	b	Prove equivalence Clausius statement with Kelvin Plank.	CO2	L3	6M
		OR			
4	a	Explain reversibility and irreversibility. List examples	CO2	L1& L2	6M
	b	Describe availability and unavailability.	CO2	L1	6M

UNIT-III

5		Prove that for an ideal gas is Cp- Cv=R.	CO3	L3	12M
		OR			
6		Derive the equation for computing the entropy change of an Ideal gas.	CO3	L3	12M

UNIT-IV

7		Develop the expression for air standard efficiency, work done of an Otto cycle.	CO4	L6	12M
		OR			
8		An engine of 250 mm bore and 375 mm stroke works on Otto cycle. The clearance volume is 0.00263 m3. The initial pressure and temperature are 1 bar and 50°C. If the maximum pressure is limited to 25 bar, find the following: (i) The air standard efficiency of the cycle. (ii)The mean effective pressure for the cycle. Assume the ideal conditions.	CO4	L3	12M

UNIT-V

9		In a steam turbine steam at 20 bar, 360°C is expanded to 0.08 bar. It then enters a condenser, where it is condensed to saturated liquid water. The pump feeds back the water into the boiler. Assume ideal processes, find per kg of steam the network and the cycle efficiency.	CO5	L3	12M
		OR			
10		A steam power plant works between 40 bar and 0.05 bar. If the steam supplied is dry saturated and the cycle of operation is Rankine, Find: (i) Cycle efficiency, (ii) Specific steam consumption.	CO5	L3	12M

***** END *****

O.P.Code: 20ME0301	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
ENGINEERING GRAPHICS
(Common to ECE, EEE & ME)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	Construct an ellipse when the distance between the focus and directrix is 35 mm and eccentricity is 3/4. Also draw the tangent and normal to any point on the curve.	CO1	L6	12M
	OR			
2	A point P is 30 mm and 50 mm respectively from two straight lines which are inclined at 75° to each other. Draw the rectangular hyperbola from p within 10 mm distance from each line.	CO1	L6	12M

UNIT-II

3	A line AB of 100mm length is inclined at an angle of 30° to HP and 45° to VP. The point A is 15mm above HP and 20mm in front of VP. Draw the projections of the line.	CO2	L2	12M
	OR			
4	End A of a line AB is 15mm above HP & 20mm infront of VP. While end B is 50mm above HP & 60mm infront of VP. The distances between End projectors of the line is 50mm. Draw the projections of line. Find its True length and True inclinations with VP and HP.	CO2	L3	12M

UNIT-III

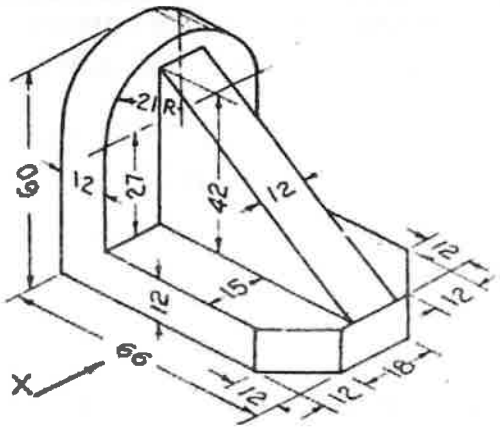
5	A thin 30° – 60° set-square has its longest edge (diagonal) on HP and inclined at 30° to VP. Its surface makes an angle of 45° with HP. Draw the projections, choosing suitable size for the set-square.	CO3	L6	12M
	OR			
6	A cylinder of base diameter 5omm and axis 70 mm has a generator in the VP and inclined at 45o to the HP. Draw its projections.	CO3	L6	12M

UNIT-IV

7	A hexagonal prism of side of base 30 mm and length of axis 75 mm is resting on its base on HP. It is cut by a section plane inclined at 45° to HP and passing through top corner. Draw the front and sectional top views of the solid and true shape of the section.	CO4	L6	12M
	OR			
8	A square prism of side of base 40 mm and axis 80 mm long, is resting on its base on HP such that, a rectangular face of it is parallel to VP. Draw the development of the prism.	CO4	L1	12M

UNIT-V

9	Draw three views of the blocks shown pictorially in figure according to first angle projection.	CO6	L6	12M



OR

10	Draw the isometric projection of a pentagonal prism of base side 35 mm and axis 60mm. The prism rests on its base on the HP with an edge of the base parallel to the VP.	CO5	L1	12M

***** END *****

O.P.Code: 20HS0830	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
ALGEBRA AND CALCULUS
(Common to All Branches)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Reduce the following matrix to Echelon form and hence find its rank: $A=\begin{bmatrix}2 & 3 & -1 & -1\\ 1 & -1 & -2 & -4\\ 3 & 1 & 3 & -2\\ 6 & 3 & 0 & -7\end{bmatrix}$	CO1	L1	6M
	b	Test for consistency and solve the following system: $2x-3y+7z=5;\ 3x+y-3z=13;\ 2x+19y-47z=32$	CO1	L2	6M

OR

2		Verify Cayley-Hamilton theorem, find A^{-1} and A^4 of the matrix $A=\begin{bmatrix}7 & 2 & -2\\ -6 & -1 & 2\\ 6 & 2 & -1\end{bmatrix}$	CO1	L4	12M

UNIT-II

3	a	Define Lagrange's mean value theorem, verify Lagrange's mean value theorem for the following functions $f(x)=\log_e x$ in $[1,e]$	CO2	L3	6M
	b	Determine the Taylor series for the function $f(x)=e^{-x}$ centred at $x=-1$	CO2	L3	6M

OR

4	a	If $u=\frac{x+y}{1-xy}$ and $v=\tan^{-1}x+\tan^{-1}y$, find $\frac{\partial(u,v)}{\partial(x,y)}$. Are u and v functionally related. If so, find the relationship.	CO2	L3	6M
	b	Find the minimum value of $x^2+y^2+z^2$, given that (i) $xyz=a^3$	CO2	L3	6M

UNIT-III

5	a	Evaluate $\int_0^1\int_0^x\int_0^y e^x\,dydx$	CO3	L2	6M
	b	Evaluate the following improper integrals	CO3	L3	6M

(i) $\int_0^1 \frac{1}{\sqrt{x}}dx$ (ii) $\int_1^\infty \frac{1}{\sqrt{x}}dx$

OR

6	a	Evaluate $\int_0^{\infty}\int_0^{\infty} e^{-(x^2+y^2)}dxdy$ by changing into polar coordinates.	CO3	L2	6M
	b	Evaluate $\int_{-c}^{c}\int_{-b}^{b}\int_{-a}^{a}\left(x^2+y^2+z^2\right)dxdydz$	CO3	L2	6M

UNIT-IV

7	a	Find $grad\, f$ if $f = xz^4 - x^2y$ at the point $(1,-2,1)$. Also find $\lvert\nabla f\rvert$	CO4	L3	6M
	b	Find the angle between normal to the surface $xy = z^2$ at the points $(4,1,2)$ and $(3,3,-3)$.	CO4	L3	6M

OR

8	a	Show that the vector $(x^2-yz)\bar{i}+(y^2-xz)\bar{j}+(z^2-xy)\bar{k}$ is irrotational and find its scalar potential.	CO4	L3	6M
	b	Prove vector identity that $curl(grad\,\phi) = 0$	CO4	L4	6M

UNIT-V

9	a	If $\bar{F} = (5xy-6x^2)\bar{i}+(2y-4x)\bar{j}$, evaluate $\int_C \bar{F}.d\bar{r}$ along the curve $y = x^3$ in the $xy-$plane from $(1,1)$ to $(2,8)$.	CO5	L4	6M
	b	If $\bar{F} = (x^2+y^2)\bar{i}-2xy\bar{j}$ evaluate $\int_C \bar{F}.d\bar{r}$ where 'C' is the rectangle in the $xy-$plane bounded by $y=0$; $y=b$ and $x=0$; $x=a$	CO5	L4	6M

OR

10	a	State Gauss's divergence theorem.	CO5	L1	2M
	b	Use divergence theorem evaluate $\iint_S \bar{F}ds$ where $\bar{F} = 4x\bar{i}-2y^2\bar{j}+z^2\bar{k}$ and 'S' is the surface bounded by the region $x^2+y^2=4$ and $z=3$	CO5	L5	10M

***** END *****

O.P.Code: 20HS0804	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
ENGINEERING CHEMISTRY
(Mechanical Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		Explain the ion exchange process used to soften water. Why is it considered as the best method to soften the water and mention various advantages and disadvantages?	CO1	L3	12M

OR

2	a	Write short notes on priming and foaming?	CO1	L2	6M
	b	Explain the term reverse osmosis. How can it be used to obtain fresh water from sea water?	CO1	L2	6M

UNIT-II

3	a	Discuss sacrificial anode cathodic protection. What is the condition for a metal to act as a sacrificial anode?	CO2	L1	6M
	b	Explain impressed current cathodic protection method to prevent corrosion.	CO2	L1	6M

OR

4	a	What are secondary cells? Explain the construction and working of Lithium Ion battery.	CO2	L1	6M
	b	What is a fuel cell? Explain the underlying principle taking the example of an H_2–O_2 fuel cell.	CO2	L3	6M

UNIT-III

5		Write the preparation, properties and uses of the following i. Buna-S rubber ii. Buna-N rubber iii. Thiokol rubber	CO3	L2	12M

OR

6		What is the necessity and significance of elemental analysis of coal? How can you analyse coal with the help of proximate and ultimate analysis?	CO3	L2	12M

UNIT-IV

7		What is viscosity? How will you determine the viscosity of lubricating oil with the help of Redwood viscometer no. 1?	CO4	L2	12M

OR

8	a	What do you mean by setting and hardening of Portland cement? Discuss the various reactions involved with the help of equations.	CO4	L2	6M
	b	Write a note on Fiber reinforced composite matcrials.	CO4	L1	6M

UNIT-V

9		Explain principle, instrumentation and applications of Scanning Electron microscopy (SEM).	CO5	L2	12M

OR

10		Discuss the principle, instrumentation and applications of Transmission electron microscopy (TEM).	CO5	L2	12M

***** END *****

O.P.Code: 20HS0802	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
APPLIED CHEMISTRY
(Common to ECE & EEE)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 × 12 = 60** Marks)

UNIT-I

1		Explain the construction, working and applications of photovoltaic cell with neat diagram.	CO1	L2	12M
		OR			
2	a	Describe the construction and working of methanol–oxygen fuel cell.	CO1	L2	6M
	b	Explain about potentiometric redox titrations.	CO1	L2	6M

UNIT-II

3	a	Explain de Broglie's dual nature hypothesis.	CO2	L2	6M
	b	What is Heisenberg's uncertainty principle?	CO2	L1	6M
		OR			
4	a	Explain the optical properties of transition-metal complexes.	CO2	L2	6M
	b	Discuss briefly about magnetic properties of metal complexes.	CO2	L2	6M

UNIT-III

5	a	Define the terms "Polymer" and "Degree of polymerization".	CO3	L1	4M
	b	Describe the types of polymerizations with suitable examples.	CO3	L2	8M
		OR			
6	a	Distinguish between thermoplastics and thermosetting plastics.	CO4	L2	6M
	b	Describe the preparation, properties and uses of Bakelite.	CO4	L2	6M

UNIT-IV

7		Explain the principle, instrumentation and applications of IR-spectroscopy.	CO5	L2	12M
		OR			
8		Discuss in detail about the principle, instrumentation and applications of Gas Chromatography.	CO5	L2	12M

UNIT-V

9	a	Define Super-conductors.	CO6	L1	2M
	b	Discuss about the principle and applications of Super-conducting materials.	CO6	L2	10M
		OR			
10	a	Discuss the applications of supra-molecules in Sensors and gas storage.	CO6	L2	8M
	b	What is Intrinsic and Extrinsic Semiconductors?	CO6	L1	4M

*** END ***

O.P.Code: 20HS0848	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
ENGINEERING PHYSICS
(Common to CE & AGE)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Describe the formation of Newton's ring with necessary theory with relevant diagram and derive the expressions for dark and bright fringes.	CO1	L2	9M
	b	In a Newton's rings experiment, the diameter of the 5th ring is 0.30 cm and the diameter of the 15th ring is 0.62 cm. Calculate the diameter of the 25th ring.	CO1	L4	3M

OR

2	a	Discuss the fringes formtion in the Fraunhofer diffraction due to single slit.	CO1	L2	8M
	b	Write briefly applications of diffraction in engineering.	CO1	L4	4M

UNIT-II

3	a	Explain the various types of crystal systems with a neat sketch and examples.	CO2	L5	8M
	b	Define coordination number and atomic packing factor.	CO2	L1	4M

OR

4	a	Explain the principle, procedure and advantage of Debye-Scherrer (Powder method) of X-ray diffraction.	CO2	L2	9M
	b	Find the angle at which the third order reflection of X-ray of $0.79A^{o}$ wavelength can occur in a calcite crystal of $3.04x10^{-10}$ m spacing?	CO2	L3	3M

UNIT-III

5	a	Define absorption coefficient of sound and derive it.	CO3	L1	7M
	b	A class room of volume 360 m3 has a reverberation time 1.6 seconds. Calculate the total sound absorption coefficient of the class room?	CO3	L3	5M

OR

6	a	Explain the detection methods of Ultrasonic waves.	CO3	L2	5M
	b	Describe the application of Ultrasonic in non-destructive testing (NDT) of material.	CO3	L2	7M

UNIT-IV

7	a	What is stress? Explain different types of stresses.	CO4	L1	6M
	b	Define strain and Obtain an expression for the internal energy n due to strain.	CO4	L1	6M

OR

8	a	Obtain the relation between rigidity modulus and Young's modulus.	CO4	L3	8M
	b	The Young's modulus for steel is $Y=2x10^{11}N/m^2$ and its rigidity. modulus $\eta=8x10^{10}N/m^2$. Estimate the Poisson's ratio and its bulk modulus.	CO4	L4	4M

UNIT-V

9	a	Define Superconductivity? Prove that super conductor is a very good diamagnetic material.	CO5	L1	8M
	b	Write the applications of superconductors.	CO5	L3	4M

OR

10	a	Explain the concept of Quantum Confinement in nano materials.	CO5	L5	4M
	b	Explain Sol-Gel technique for synthesis of nanomaterial.	CO5	L5	8M

***** END *****

O.P.Code: 20HS0849	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations July/August-2024
APPLIED PHYSICS
(Common to CSE, CAD, CCC, CSM, CIC, CSIT & CAI)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Describe the formation of Newton's ring with necessary theory with relevant diagram and derive the expressions for dark and bright fringes.	CO1	L1	6M
	b	What are engineering applications of interference?	CO1	L2	6M
		OR			
2	a	Define following terms i. Grating spectrum ii. Grating element.	CO1	L1	6M
	b	How wavelength light is determined by diffraction grating.	CO1	L2	6M

UNIT-II

3	a	Classify the solids into conductor, semiconductor & insulators based on band theory of solids.	CO2	L5	6M
	b	Write brief note on Fermi Dirac distribution. Describe the effect of temperature on Fermi Dirac distribution function.	CO2	L2	6M
		OR			
4	a	Explain the Faraday's law and Ampere's law through the Maxwell equations.	CO2	L2	8M
	b	Write the applications of Faraday's law	CO2	L1	4M

UNIT-III

5	a	Derive the relation between the various Einstein's coefficients of absorption and emission of radiation.	CO3	L4	8M
	b	Explain population inversion.	CO3	L2	4M
		OR			
6	a	Define total internal reflection and derive the conditions for total internal reflection.	CO3	L4	8M
	b	Describe the construction of optical fiber.	CO3	L2	4M

UNIT-IV

7	a	Derive the expression for the conductivity of intrinsic semiconductor and energy band structure with relevantexpressions.	CO4	L4	6M
	b	The following data are given for an intrinsic Ge at 300K. Calculate the conductivity of the sample? (ni= 2.4 x10 19m -3 , μe = 0.39 m 2 -V -1S -1 , μp = 0.19 m 2 -V -1 S -1).	CO4	L4	6M
		OR			
8	a	Explain the formation of p-n junction.	CO4	L2	4M
	b	Describe the construction and working mechanism of Photodiode.	CO4	L2	8M

UNIT-V

9	a	Explain Flux quantization.	CO5	L2	6M
	b	What are the applications of superconductors.	CO5	L1	6M
		OR			
10	a	What are the techniques available for synthesizing nanomaterials?	CO5	L1	4M
	b	Explain ball milling technique for synthesis of nanomaterial.	CO5	L3	8M

***** END *****