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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2026
APPLIED CHEMISTRY
(Common to CAD, CSIT, CAI, CIC, CSE, CCC & CSM)

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

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

UNIT-I

1	a	What is Electrochemical cell ? Give an example.	CO1	L1	7M
	b	Calculate the single electrode potential of zinc in 0.05M ZnSO4 solution at 25^0C. (E^0 Zn/Zn^{2+} = 0.763V.)	CO1	L3	5M
		OR			
2		What is secondary Battery ? Explain the construction and working of Lithium Ion rechargeable cell with cell reactions.	CO1	L3	12M

UNIT-II

3		Derive Schrodinger wave equation? Explain the significance of the Ψ and Ψ^2 .	CO2	L3	12M
		OR			
4	a	Write the postulates of molecular orbital theory.	CO2	L1	6M
	b	Draw the molecular orbital diagrams of Oxygen molecule (O2)?	CO2	L3	6M

UNIT-III

5	a	Distinguish between Thermoplastics and Thermosetting plastics.	CO3	L4	6M
	b	Define polymer.What is functionality of monomer?	CO3	L1	6M
		OR			
6		Define polymerization.Describe the preparation, properties and uses of Bakelite.	CO3	L3	12M

UNIT-IV

7	a	Write a short note on Beer-Lambert's Law.	CO4	L1	6M
	b	Write a note on atomic absorption and molecular absorption.	CO4	L1	6M
		OR			
8		Explain principle, instrumentation & applications of UV-visible spectroscopy with neat diagram.	CO4	L2	12M

UNIT-V

9		Explain in detail about principle and application of semiconductors?	CO5	L2	12M
		OR			
10	a	What is meant by Nanomaterials ? How are Nanomaterials Classified.	CO5	L3	6M
	b	Write a short note on Fullerenes?	CO5	L2	6M

***** END *****

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2026
APPLIED PHYSICS
(Common to EEE & ECE)

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

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

UNIT-I

1	a	State and explain principle of superposition.	CO1	L1	6M
	b	Summarizing the importance conditions to get interference.	CO1	L2	6M
		OR			
2	a	Define diffraction? Distinguish between Fraunhofer and Fresnel's diffraction.	CO1	L1 L4	6M
	b	Distinguish between Interference and Diffraction?	CO1	L4	6M

UNIT-II

3	a	Describe the electrical conductivity in a metal using quantum free electronic theory.	CO2	L3	8M
	b	Write advantages quantum free electron theory over classical free electron theory.	CO2	L1	4M
		OR			
4	a	State and Explain Gauss's Theorem for divergence.	CO2	L4	6M
	b	State and Explain Stoke's Theorem for curl.	CO2	L4	6M

UNIT-III

5	a	Describe the construction and working principle of He-Ne Laser with the help of a neat diagram.	CO3	L3	8M
	b	Write the advantages of He-Ne laser.	CO3	L1	4M
		OR			
6	a	Describe the construction of optical fiber.	CO3	L3	6M
	b	Explain the working principle of optical fiber.	CO3	L4	6M

UNIT-IV

7	a	What is Fermi level? Prove that the Fermi level is lies exactly in between conduction band And valance band of intrinsic semiconductor.	CO4	L4	8M
	b	Draw the energy band structure of intrinsic semiconductor.	CO4	L3	4M
		OR			
8	a	Describe the Hall Effect in semiconductors.	CO4	L3	8M
	b	Write the applications of Hall Effect.	CO4	L1	4M

UNIT-V

9	a	Explain the Type-I and Type-II superconductors.	CO5	L1	6M
	b	What is Meissner effect?	CO5	L4	6M
		OR			
10	a	What are the techniques available for synthesizing nanomaterials?	CO5	L4	4M
	b	Explain ball milling technique for synthesis of nanomaterial.	CO5	L1	8M

***** END *****

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations April-2026

ENGINEERING CHEMISTRY

(Common to CE & AGE)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1	a	Explain about demineralization of brackish water by Reverse Osmosis.	L2	6M
	b	What is priming and foaming?	L1	6M
		OR		
2		Describe the Zeolite or Permutit process for softening of water. what are the advantages and disadvantages of zeolite process.	L3	12M

UNIT-II

3	a	What is primary Battery? Write a note on Zinc-air battery.	L1	6M
	b	Describe the Construction and Working of Methanol – Oxygen Fuel cell.	L3	6M
		OR		
4	a	Write a note on sacrificial anodic protection?	L1	4M
	b	What is electroplating? Explain electroplating of Nickel and copper?	L2	8M

UNIT-III

5		Explain the mechanism of addition polymerization.	L2	12M
		OR		
6	a	Write a note on Octane value and Cetane value.	L1	6M
	b	Write the preparation, properties and application of Buna-S rubber, Buna-N rubber.	L2	6M

UNIT-IV

7		Define Viscosity? Determine the viscosity of lubricating oil by Redwood Viscometer.	L2	12M
		OR		
8	a	What is cement? How do you classify the cement?	L1	6M
	b	Write a note on Fiber reinforced materials.	L1	6M

UNIT-V

9		Write a note on any one chemical and electrochemical methods of preparation of nano metals.	L1	12M
		OR		
10		Explain principle, instrumentation and applications of Scanning Electron microscopy (SEM)	L2	12M

*** END ***

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2026
ENGINEERING PHYSICS
(Mechanical Engineering)

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

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

		UNIT-I			
1	a	State and explain principle of superposition.	CO1	L1	6M
	b	Summarize the important conditions to get interference.	CO1	L2	6M
		OR			
2	a	Distinguish between Interference and Diffraction?	CO1	L4	6M
	b	Distinguish between Fraunhoffer and Fresnel diffraction.	CO1	L4	6M
		UNIT-II			
3	a	Derive the packing factor of SC.	CO2	L4	6M
	b	Derive the packing factor of BCC.	CO2	L4	6M
		OR			
4	a	Explain the principle, procedure and advantage of Debye-Scherrer (Powder method) of X-ray diffraction.	CO2	L4	9M
	b	Find the angle at which the third order reflection of X-ray of 0.79A° wavelength can occur in a calcite crystal of 3.04×10^{-10} spacing.	CO2	L1	3M
		UNIT-III			
5	a	Define Reverberation and Reverberation time.	CO3	L1	7M
	b	What are the basic requirements of acoustically good hall?	CO3	L1	5M
		OR			
6	a	Explain Piezoelectric effect.	CO3	L4	4M
	b	How ultrasonics are produced by using piezoelectric generator?	CO3	L3	8M
		UNIT-IV			
7	a	What is Hooke's law? Explain.	CO4	L1	4M
	b	Describe the behavior of a wire under an increasing load.	CO4	L3	8M
		OR			
8	a	Define Young's modulus and bulk modulus.	CO4	L1	4M
	b	Obtain the relation between the Young's modulus and bulk modulus.	CO4	L4	8M
		UNIT-V			
9	a	What is Meissner effect?	CO5	L1	5M
	b	Explain the Type-I and Type-II superconductors.	CO5	L1	7M
		OR			
10	a	What are the techniques available for synthesizing nanomaterials?	CO5	L1	4M
	b	Explain ball milling technique for synthesis of nanomaterial.	CO5	L4	8M

***** END *****

Q.P.Code: 20EE0254 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2026
Electrical Technology
(Electronics & Communications Engineering)

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

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

UNIT-I

1	Explain the constructional details of a D.C generator.	CO1	L2	12M
	OR			
2	**a** Describe the different types of generator.	CO1	L2	6M
	b Write different applications of dc generators.	CO1	L5	6M

UNIT-II

3	**a** Explain the working principle of D.C motor.	CO2	L2	6M
	b State the voltage and power equation of D.C motor explaining each term.	CO2	L3	6M
	OR			
4	Explain various losses and Efficiency of a D.C. machine.	CO3	L2	12M

UNIT-III

5	Draw the constructional diagram of a single –phase transformer and explain all the parts.	CO4	L2	12M
	OR			
6	With relevant phasor diagrams, explain the operation of a practical single phase transformer Operating on lagging and leading power factor condition.	CO4	L4	12M

UNIT-IV

7	Explain the principle of operation of 3-phase induction motor with neat sketch.	CO5	L2	12M
	OR			
8	**a** List the differences between squirrel cage and wound rotor.	CO5	L4	6M
	b A 3 phase 4 pole 50 Hz induction motor runs at 1460 r.p.m. find its (i)synchronous speed (ii) slip speed (iii) percentage slip.	CO5	L4	6M

UNIT-V

9	Explain the working principle of a Synchronous generator.	CO6	L2	12M
	OR			
10	A 200kVA, 415 V, 50 Hz, 3 Ø alternator has effective armature resistance of 0.01Ω and an armature leakage reactance of 0.05Ω. Compute the voltage induced in the armature winding when the alternator is delivering rated current at a load p.f of (i) 0.8 Lagging (ii) 0.8 leading.	CO6	L3	12M

***** END *****

O.P.Code: 20CS0503 | R20 | H.T.No.

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

B.Tech I Year II Semester Supplementary Examinations April-2026

DIGITAL LOGIC DESIGN

(Common to CAD, CSIT, CAI, CIC, CSE, CCC, CSM)

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

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

		UNIT-I			
1	a	Convert the following: i) $(41.6875)_{10}$ to Hexadecimal number ii) $(11001101.0101)_2$ to base-8 and base-4	CO1	L5	6M
	b	Using 2'scomplement, subtract $(111001)_2$ from $(101011)_2$.	CO1	L5	6M
		OR			
2	a	Simplify the Boolean expressions to minimum number of literals. i) X' + XY + X Z'+XYZ' ii) (X+Y) (X+Y')	CO1	L6	6M
	b	Obtain Complement of the following Boolean Expressions: i) A+B+A'B'C ii) AB + A (B +C) +B'(B+D)	CO1	L5	6M
		UNIT-II			
3		Simplify the Boolean expression using K-MAP and draw the AOI logic diagram. F(A, B,C,D,E)=∑m(0,2,4,6,9,13,21,23,25,27,29,31).	CO1	L6	12M
		OR			
4		Simplify the following expressions, and implement them with two-level NAND gate circuits: i)AB′ + ABD + ABD′ + A′C′D′ + A′BC′ ii)BD + BCD′ + AB′C′D′	CO5	L6	12M
		UNIT-III			
5	a	Explain about Binary Half Adder with truth table and logic diagram.	CO2	L2	6M
	b	Design and draw a full adder circuit.	CO5	L3	6M
		OR			
6	a	Design and implement the following Boolean function by 8:1 Multiplexer. (A,B,C.D)=Σm(0,1,2,5,7,8,9,14,15).	CO5	L3	6M
	b	Design 1:8 demultiplexer using two 1:4 demultiplexer.	CO4	L3	6M
		UNIT-IV			
7	a	Explain the analysis procedure of sequential circuits.	CO4	L2	4M
	b	What is race-around condition? How race around condition is eliminated in a Master–slave J-K flip-flop?	CO5	L2	8M
		OR			
8	a	Differentiate synchronous and asynchronous counters.	CO4	L4	4M
	b	Design a 3-bit Synchronous UP/DOWN Counter.	CO5	L3	8M
		UNIT-V			
9	a	What is RAM? Design a 4 X 4 RAM.	CO1	L1	8M
	b	Explain in brief about memory decoding.	CO1	L2	4M
		OR			
10		Design and implement the following functions using PLA. A(x,y,z)=∑m(1,2,4,6), B(x,y,z)=∑m(0,1,6,7), C(x,y,z)=∑m(2,6).	CO6	L6	12M

***** END *****

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2026
BASIC THERMODYNAMICS
(Mechanical Engineering)

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

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

UNIT-I

1	What is a thermodynamic system? Explain different types of systems with suitable examples.		**CO1**	**L1 & L2**	**12M**
	OR				
2	Explain thermodynamic State, Process and Cycle.		**CO1**	**L2**	**12M**

UNIT-II

3	**a**	Compare heat pump and a refrigerator.	**CO2**	**L5**	**6M**
	b	10 kg of fluid per minute goes through a reversible steady flow process. The properties of fluid at the inlet are: P1 = 1.5 bar, ρ1 = 26 kg/m3, [CO1] = 110 m/s and u1 = 910 kJ/kg and at the exit are P2 = 5.5 bar, ρ2 = 5.5 kg/m3, [CO2] = 190 m/s and u2 = 710 kJ/kg. During the passage, the fluid rejects 55 kJ/s and rises through 55 meters. Determine : (i) The change in enthalpy (Δ h) ; (ii) Work done during the process (W).	**CO2**	**L3**	**6M**
	OR				
4	Derive the reversible adiabatic process law $pv^{\gamma} = c$		**CO3**	**L3**	**12M**

UNIT-III

5	Prove that for an ideal gas $C_p - C_v = R$.		**CO3**	**L3**	**12M**
	OR				
6	Develop the expression of work transfer for an ideal gas in reversible isothermal process.		**CO3**	**L3**	**12M**

UNIT-IV

7	Develop the expression for air standard efficiency, work done of an Otto cycle.		**CO4**	**L6**	**12M**
	OR				
8	Build the phase equilibrium diagram for a pure substance T-S plot with relevant constant property line.		**CO4**	**L3**	**12M**

UNIT-V

9	Describe Simple steam power cycle with neat sketches.		**CO5**	**L2**	**12M**
	OR				
10	A simple Rankine cycle works between pressures 28 bar and 0.06 bar, the initial condition of steam being dry saturated. Calculate the cycle efficiency, work ratio and specific steam consumption.		**CO5**	**L3**	**12M**

***** END *****

O.P.Code: 20EC0401	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2026
FUNDAMENTALS OF DIGITAL COMPUTING SYSTEMS
(Electronics & Communications Engineering)

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

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

		UNIT-I			
1		Briefly explain the different elements that are made of a computer-based information system.	CO1	L1	12M
		OR			
2	a	Briefly explain the communication components of a computer system.	CO1	L2	6M
	b	List the types of computers and write short notes on each computer.	CO1	L4	6M
		UNIT-II			
3	a	Explain general concept of system with an example.	CO2	L5	6M
	b	Sketch the partial view of business application architecture.	CO2	L3	6M
		OR			
4	a	Write short notes on cloud computing.	CO2	L3	6M
	b	Classify the services provided by cloud computing and explain them briefly.	CO2	L3	6M
		UNIT-III			
5	a	Discuss various number systems of a computer.	CO3	L6	6M
	b	Tabulate the numbers up to 15 which can be represented in base-2, base-8, base-10 and base -16.	CO3	L5	6M
		OR			
6	a	Convert the given decimal number $(6026)_{10}$ into octal, Hexa decimal and Binary.	CO3	L4	6M
	b	Convert the given hexadecimal number $(ABCD)_{16}$ into Binary, Octal and Decimal.	CO3	L4	6M
		UNIT-IV			
7	a	Briefly explain the three standards that are used in common for alphanumeric characters.	CO4	L5	6M
	b	Define image metadata. Give at least three examples of metadata that would be required for a bitmap image.	CO4	L1	6M
		OR			
8		With a neat sketch, describe how an A-to-D converter converts audio data into binary data.	CO4	L2	12M
		UNIT-V			
9	a	Define one's complement, two's complement form and explain the relation between them.	CO5	L1	6M
	b	Describe the exponential notation with an example.	CO5	L2	6M
		OR			
10	a	What are the programming considerations and explain.	CO5	L1	6M
	b	Briefly explain about IEEE 754 Standard.	CO5	L5	6M

***** END *****

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2026
C PROGRAMMING AND DATA STRUCTURES
(Common to ECE, EEE, ME)

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

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

		UNIT-I			
1	**a**	List different C language elements.	**CO1**	**L2**	**4M**
	b	Explain the C language elements with example.	**CO1**	**L2**	**8M**
		OR			
2	**a**	List the different decision statements available in C.	**CO1**	**L4**	**4M**
	b	Discuss each decision statement with suitable example.	**CO1**	**L2**	**8M**
		UNIT-II			
3	**a**	Distinguish between call by value and call by reference with an example programs.	**CO2**	**L3**	**6M**
	b	How to use Array as Function argument? Explain with an example program.	**CO2**	**L2**	**6M**
		OR			
4	**a**	Create a C program to count the vowels, consonants, special symbols and space in a given string.	**CO2**	**L6**	**6M**
	b	Create a C program to perform the following string library function strlen(), strcpy(), strcat(), strcmp().	**CO2**	**L4**	**6M**
		UNIT-III			
5	**a**	Explain the concept of pointer to pointers with examples.	**CO3**	**L2**	**6M**
	b	Explain the concept of void pointers with examples.	**CO3**	**L2**	**6M**
		OR			
6	**a**	Define structure within a structure. Explain with an example.	**CO3**	**L3**	**6M**
	b	Describe about array of structures.	**CO3**	**L2**	**6M**
		UNIT-IV			
7	**a**	What is data structure? Explain types of data structures.	**CO3**	**L1**	**6M**
	b	What is a stack? Write the representation of stacks.	**CO3**	**L1**	**6M**
		OR			
8	**a**	Distinguish between singly linked list and doubly linked list.	**CO4**	**L4**	**6M**
	b	List the applications of linked list.	**CO4**	**L1**	**6M**
		UNIT-V			
9	**a**	Explain about linear search with algorithm.	**CO5**	**L2**	**6M**
	b	Explain about binary search with algorithm.	**CO5**	**L2**	**6M**
		OR			
10	**a**	Explain the difference between merge sort and quick sort.	**CO5**	**L2**	**6M**
	b	Sort the following numbers using quick sort: 54,26,93,17,77,31,44,55,20	**CO5**	**L4**	**6M**

***** END *****

O.P.Code: 20HS0831 | R20 | H.T.No. | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2026
DIFFERENTIAL EQUATIONS AND COMPLEX ANALYSIS
(Common to CE, EEE, ME, ECE & AGE)

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

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

UNIT-I

1	a	Solve $(2x-y+1)+(2y-x-1)dy=0$.	CO1	L3	6M
	b	Solve $(y^2-2xy)+(2xy-x^2)dy=0$.	CO1	L6	6M

OR

2	a	Solve $x\frac{dy}{dx}+y=x^3y^6$.	CO1	L6	6M
	b	Solve $\frac{dy}{dx}+y\tan x=y^2\sec x$.	CO1	L6	6M

UNIT-II

3	a	Solve $(D^2+4)y=\sec 2x$ by the method of variation of parameters.	CO2	L3	6M
	b	Solve $(D^2+1)y=\csc x$ by the method of variation of parameters.	CO2	L6	6M

OR

4		An uncharged condenser of capacity C is charged by applying an EMF $E\sin\frac{t}{\sqrt{LC}}$ through leads of self-inductance L and negligible resistance. Prove that at time t the charge on one of the plates is: $q(t)=\frac{EC}{2}\left[\sin\left(\frac{t}{\sqrt{LC}}\right)-\frac{t}{\sqrt{LC}}\cos\left(\frac{t}{\sqrt{LC}}\right)\right]$.	CO2	L5	12M

UNIT-III

5	a	Form the PDE by eliminating the constants from $2z=\frac{x^2}{a^2}+\frac{y^2}{b^2}$.	CO3	L2	6M
	b	Form the PDE by eliminating the constants from $(x-a)^2+(y-b)^2=z^2\cot^2\alpha$ where α is a parameter.	CO3	L2	6M

OR

6		Find the temperature $u(x,t)$ in a bar OA of length l which is perfectly insulated laterally and whose ends are at $0°C$, given that the initial temperature at point P (where $OP=x$) is $u(x,0)=f(x)$ for $0\le x\le l$.	CO3	L1	12M

UNIT-IV

7	a	Show that $u=\frac{1}{2}\log(x^2+y^2)$ is harmonic.	CO4	L2	6M
	b	If $w=f(z)$ is analytic, show that $\left(\frac{\partial^2}{\partial x^2}+\frac{\partial^2}{\partial y^2}\right)\|\mathrm{Re}[f(z)]\|^2=2\|f'(z)\|^2$.	CO4	L5	6M

OR

8	a	Find the image of the infinite strip bounded by $x=0$ and $x=\pi/4$ under $w=\cos z$.	CO4	L1	6M
	b	Prove that $w=\sin z$ maps the families of lines $x=$ constant and $y=$ constant into two families of confocal central conics.	CO4	L5	6M

UNIT-V

9		Show that $\int_C(z+1)dz=0$ where C is the boundary of the square with vertices $0,1,1+i,i$.	CO5	L2	12M

OR

10		Evaluate $\int_0^{2\pi}\frac{1}{a+b\cos\theta}d\theta=\frac{\pi}{\sqrt{a^2-b^2}}, a>b>0$.	CO5	L2	12M

*** END ***

O.P.Code: 20HS0835 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2026
PROBABILITY & STATISTICS
(Common to CAD, CSIT, CAI, CIC, CSE, CCC & CSM)

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

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

UNIT-I

1 a In a certain town 40% have brown hair, 25% have brown eyes and 15% have both brown hair and brown eyes. A person is selected at random from the town. **8M**
i) If he has brown hair, what is the probability that he has brown eyes also?
ii) If he has brown eyes, determine the probability that he does not have brown hair?

b Let A and B be events such that $p(A)=0.6$, $p(B)=0.4$ and $p(A\cup B)=0.8$. Are A and B to be independent? **4M**

OR

2 a A random variable 'X' has the following distribution: **12M**

$X=x$	0	1	2	3	4	5	6	7
$p(X=x)$	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2+k$

Determine (i) value of the constant k (ii), $p(X>5)$, $p(3\le X\le 6)$ (iii) determine distribution function and find the minimum value of 'x' *if* $p(X<x)>0.5$. (iv) variance of the distribution.

UNIT-II

3 a Out of 800 families with 5 children each, how many would you expect to have (i) 3 boys (ii) 5 girls (iii) either 2 or 3 boys. Assume equal probabilities for boys and girls. **6M**

b If 'X' is a Poisson variate $3p(X=4)=\frac{1}{2}p(X=2)+p(X=0)$ **6M**
Find (i) the mean (ii) $p(X\le 2)$

OR

4 Derive mean and variance of Normal distribution. **12M**

UNIT-III

5 Compute Pearson's and Bowley's coefficient of skewness for the following data: **12M**

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
f	5	9	14	20	25	15	8	4

OR

6 Calculate the correlation coefficient for the following data: **12M**

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

UNIT-IV

7 a Fit a straight line equation $y=a+bx$ for the following using Least square method: **6M**

x	1	2	3	4	5
y	14	27	40	55	68

b Fit the curve of the form $y=ae^{bx}$ to the following data: **6M**

x	1	5	7	9	12
y	10	15	12	15	21

OR

8 a A sample of 400 items is taken from a population whose standard deviation is 10. The mean of the sample is 40.Test whether the sample has come from a population with mean 38. **6M**

b In two large populations, there are 30%, and 25% respectively of fair haired people. Is this difference likely to be hidden in samples of 1200 and 900 respectively from the two populations? **6M**

UNIT-V

9 a A machinist is making engine parts with axle diameters of 0.700 inch. A random sample of 10 parts shows a mean diameter of 0.742 inch with a S.D of 0.040 inch. Compute the statistic you would use to test whether the work meeting the specification at 0.05 l.o.s. **6M**

b Samples of two types of electric light bulbs were tested for length of life and following data were obtained: **6M**

	Type I	Type II
Sample size	$n_1=8$	$n_2=7$
Sample mean	$\bar{x}=1,234 hrs$	$\bar{y}=1,036 hrs$
Sample S.D.	$s_1=36 hrs$	$s_2=40 hrs$

Is the difference in the means sufficient to warrant that type I is superior to type II regarding length of life?

OR

10 Two independent samples of sizes 7 and 6 have the values: **12M**
Sample A: 28 30 32 33 33 29 34
Sample B: 29 30 30 24 27 29
Examine whether the samples have been drawn from normal populations having the same variance?

*** END ***

O.P.Code: 20EC0402	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2026
ELECTRONIC DEVICES AND CIRCUITS
(Electrical & Electronics Engineering)

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

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

UNIT-I

1	a	Sketch the V-I Characteristics of a PN Junction Diode and illustrate its action under forward bias and reverse bias.	CO1	L2	6M
	b	Construct the Positive and Negative Diode Clippers and explain with neat waveforms.	CO1	L3	6M

OR

2	a	Show that the Zener Diode can act as a voltage regulator with a neat circuit diagram.	CO1	L5	6M
	b	Derive the expression for forward dynamic resistance of a PN junction diode.	CO1	L4	6M

UNIT-II

3	a	Draw the circuit diagram of a Full Wave Rectifier and with the help of waveforms describe its operation.	CO2	L4	6M
	b	A Full Wave Rectifier circuit is fed from a transformer having a center-tapped secondary winding. The RMS voltage from either end of secondary to center tap is 30V. If the diode forward resistance is 2Ω and that of the half secondary is 8Ω, for a load of 1 KΩ. Calculate DC power delivered to the load, efficiency of rectification and Transformer Utilization Factor (TUF) of secondary.	CO2	L3	6M

OR

4	a	Demonstrate the working principle of LC filter with neat circuit diagram and derive the expression for its ripple factor.	CO2	L2	6M
	b	Explain dynamic scattering LCD and field effect LCD with neat diagram. List the advantages and applications	CO2	L2	6M

UNIT-III

5	a	Explain the construction of NPN transistor with a neat diagram.	CO3	L2	6M
	b	Evaluate the relation between α and β of a Transistor.	CO3	L3	6M

OR

6	a	Illustrate the construction and Characteristics of N-Channel depletion type MOSFET.	CO3	L2	6M
	b	Explain the construction and working principle of N-Channel JFET.	CO3	L2	6M

UNIT-IV

7	a	Examine the concept of DC and AC Load lines and discuss the criteria for fixing the Q-point.	CO4	L3	6M
	b	Define Stability Factor S. Derive the stability factor, S for collector to base bias of BJT.	CO4	L4	6M

OR

8	a	Illustrate Thermistor Compensation Technique for stabilization against variations in Q-point.	CO4	L3	6M
	b	Estimate the condition for achieving Thermal Stability.	CO4	L3	6M

UNIT-V

9	a	Draw the hybrid model for a transistor in CE configuration and derive its hybrid parameters.	CO5	L4	6M
	b	Draw the simplified h-parameter model for a transistor in CE, CB and CC configuration.	CO5	L4	6M

OR

10	a	Summarize the expressions for input impedance, output impedance and voltage gain ofJFET Common Drain amplifier with neat diagram.	CO5	L3	6M
	b	A CE amplifier is driven by a voltage source of internal resistance Rs= 800Ω and the load impedance of RL=1000Ω. The h-parameters are h_{ie}=1k, h_{fe}=50, hoe = 25μA/V and h_{re} = 2 x 10^{-4} . Find current gain, voltage gain, input impedance and output impedance using approximate analysis.	CO5	L4	6M

***** END *****

24.04.2026 AN

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2026
COMMUNICATIVE ENGLISH
(Computer Science & Information Technology)

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

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

UNIT-I

1	a	Define the different Parts of Speech with suitable examples for each.	CO1	L1	6M
	b	Write a formal letter to your Principal requesting a week's leave for a family function.	CO1	L3	6M
		OR			
2	a	Explain the importance of "Attitude is Everything" and positive thinking in personal growth.	CO1	L2	6M
	b	Describe the character of Subbaiah as depicted in R.K. Narayan's "Half a Rupee Worth".	CO1	L2	6M

UNIT-II

3	a	Define Punctuation and explain the use of the Comma, Full stop, and Question mark with examples.	CO2	L1	6M
	b	Change the following sentences from Active Voice to Passive Voice: i. She sings a song. ii. They are building a house. iii. He has finished the work.	CO2	L3	6M
		OR			
4	a	Discuss the significance of self-confidence and self-motivation in a student's career.	CO2	L2	6M
	b	What is the central theme of the story "The Thakur's Well" by Premchand?	CO2	L2	6M

UNIT-III

5	a	What is Report Writing? Explain the basic structure of a formal report.	CO3	L1	6M
	b	Fill in the blanks with appropriate verb forms according to Subject-Verb Agreement: i. Either the cat or the dog ___ (is/are) in the yard. ii. The committee ___ (has/have) signed the report. iii. Mathematics ___ (is/are) my favorite subject.	CO3	L3	6M
		OR			
6	a	Define Emotional Intelligence and its role in improving work efficiency.	CO3	L1	6M
	b	Summarize the poem "I am not that Woman" by Kishwar Naheed in your own words.	CO3	L2	6M

UNIT-IV

7	a	Explain the concept of "Information Transfer" with an example of converting a table into a paragraph.	CO4	L2	6M
	b	Write the Synonyms and Antonyms for the following words: i. Happy ii. Ancien iii. Brave	CO4	L1	6M
		OR			
8	a	Discuss the "Urgent and Important" matrix in the context of effective Time Management.	CO4	L2	6M
	b	How does the protagonist in "What is my name?" regain her identity?	CO4	L2	6M

UNIT-V

9	a	Write a structured essay on the "Impact of Technology on Modern Education."	CO5	L3	6M
	b	Correct the errors in the following sentences related to Tenses and Articles: i. He is a honest man. ii. They has been playing since morning. iii. She is waiting for you since two hours.	CO5	L1	6M
		OR			
10	a	Explain the importance of Goal Setting and differentiate between short-term and life goals.	CO5	L2	6M
	b	What are the views of APJ Abdul Kalam on the "Power of Prayer"?	CO5	L2	6M

*** END ***

O.P.Code: 20EE0201	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2026
FUNDAMENTALS OF ELECTRICAL CIRCUITS
(Electrical & Electronics Engineering)

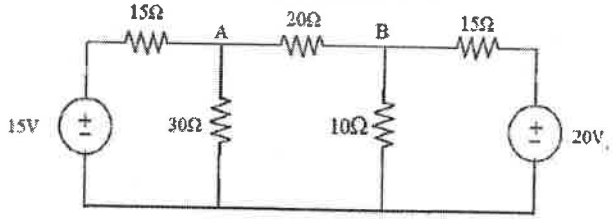
Time: 3 Hours **Max. Marks: 60**

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

UNIT-I

1	a	Explain in detail about passive elements.	CO1	L1	6M
	b	Determine the Equivalent Capacitance when two capacitors are connected in Series & Parallel.	CO1	L2	6M

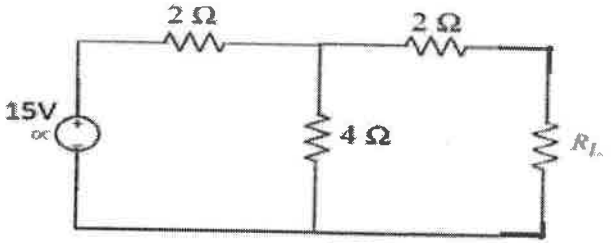
OR

2		Determine the current in branch A-B by using KVL 	CO1	L3	12M

UNIT-II

3	a	State &explain Super position theorem.	CO2	L1	6M
	b	State &explain Thevenin's theorem.	CO2	L2	6M

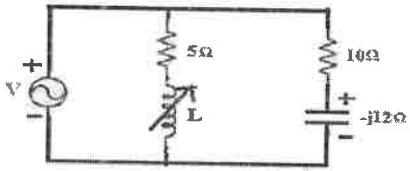
OR

4		Find load current by using Thevenin's theorem for the following circuit where RL =3Ω 	C02	L3	12M

UNIT-III

5	a	Explain about Series resonance with phasor diagrams.	C03	L2	6M
	b	A series RLC circuit has R=10Ω, L=0.1H and C=50μF. The applied voltage is 100V. Find Resonant frequency & Quality factor of a coil.	C03	L2	6M

OR

6		Find the value of 'L' at which the circuit resonates at a frequency of 1000 rad/sec in the circuit shown in figure. 	C03	L3	12M

UNIT-IV

7	a	Explain self-inductance with expressions.	C04	L2	6M
	b	What is the maximum possible mutual inductance of two inductively coupled coils with self-inductance of 50mH and 200mH?	C04	L2	6M

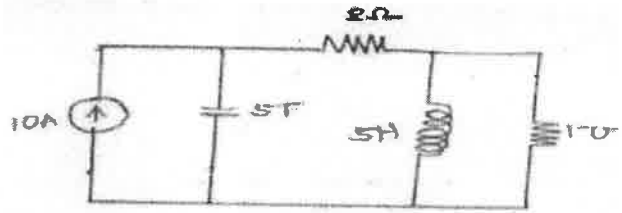
OR

8		An ideal transformer is rated at 2400/120 V, 9.6 kVA, and has 50 turns on the secondary side. Calculate: (i) the turns ratio, (ii) the number of turns on the primary side, and (iii) the current ratings for the primary and secondary windings.	C04	L3	12M

UNIT-V

9	a	Write the procedure for constructing tie-set matrix	C05	L1	6M
	b	i) Define graph. ii) Define planar and non-planar graph. iii) Define duality.	C05	L1	6M

OR

10		Write the procedure to draw the dual network and find dual network for the following 	C05	L3	12M

*** END ***

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2026
ENGINEERING GRAPHICS
(Common to CAD, CSIT, CAI, CIC, CSE, CCC & CSM)

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

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

UNIT-I

1	Construct an ellipse, with distance of the focus from the directrix as 50 mm and eccentricity as 2/3. Also draw normal and tangent to the curve at a point 40 mm from the directrix.	CO1	L3	12M
	OR			
2	Construct a hypo cycloid of a circle of 50 mm diameter, which rolls inside another circle of 180 mm diameter for one revolution counter clockwise.	CO1	L3	12M

UNIT-II

3	Draw the projections of the following points, keeping the distance between the projectors as 25mm on the same reference lines. A – 20mm above HP and 30mm in front of VP B – 20mm above HP and 30mm behind VP C – 20mm below HP and 30mm behind VP D – 20mm below HP and 30mm in front of VP E – On HP and 30mm in front of VP F – On VP and 20mm above HP G – Lying on both HP and VP	CO2	L3	12M
	OR			
4	A line AB of 100mm length is inclined at an angle of 300 to HP and 450 to VP. The point A is 15mm above HP and 20mm in front of VP. Draw the projections of the line.	CO2	L3	12M

UNIT-III

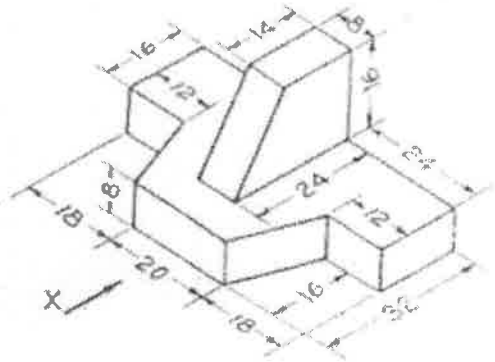
5	A square plane ABCD of side 30mm is parallel to HP and 20mm away from it. Draw the projections of the plane, when (i) two of its sides are parallel to VP and (ii) and one of its side is inclined at 300 to VP.	CO3	L3	12M
	OR			
6	A cylinder of base diameter 5omm and axis 70 mm has a generator in the VP and inclined at 45o to the HP. Draw its projections.	CO3	L3	12M

UNIT-IV

7	A pentagonal pyramid with edge of base 25 mm and axis 65 mm long, its base is resting on HP. It is cut by a section plane, inclined at 600 to HP and perpendicular to VP at bisect the axis. Draw the projections and obtain the true shape of the section.	CO4	L3	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	L3	12M

UNIT-V

9	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	L3	12M
	OR			
10	Draw three views of the blocks shown pictorially in figure according to first angle projection.	CO6	L3	12M



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