SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April– 2023
DIFFERENTIAL EQUATIONS AND COMPLEX ANALYSIS
(Common to CE, EEE, ME & ECE)

Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1 a) Solve the differential equation $x\frac{dy}{dx} + y = \log x$ L6   6 M

b) Solve the differential equation $y'' - 3y' + 2y = \sin 2x$ L3   6 M

OR

2 a) Solve the differential equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = x^3$ L6   6 M

b) Solve the differential equation $(D^2 - 4D + 4)y = e^{2x}\cos 3x$ L3   6 M

UNIT-II

3 Solve the differential equation $(1+x)^2\frac{d^2y}{dx^2} + (1+x)\frac{dy}{dx} + y = \sin[2\log(1+x)]$ L6   12 M

OR

4 Calculate the current 'i' in the LCR circuit if $L = 20\,H$, $C = 0.01\,F$, $R = 80\,\Omega$ L4   12 M
and $E = 100\,V$ when the initial current and charge are zero in the circuit.

UNIT-III

5 a) Form the partial differential equation of $f(x^2 + y^2, z - xy) = 0$ by eliminating   L2   6 M
the arbitrary function f.

b) Solve the partial differential equation $4u_x + u_y = 3u$, $u(0,y) = e^{-5y}$ by the   L6   6 M
method of separation of variables.

OR

6 Find the temperature $u(x,t)$ on a bar OA of length l which is perfectly insulated   L1   12 M
laterally and whose ends O and A are kept at $0°C$, given that the initial
temperature at any point P of the rod is $u(x,0) = f(x), 0 \leq x \leq l$

UNIT-IV

7 a) Find the analytic function whose imaginary part is $v = e^x(x\sin y + y\cos y)$ L1   6 M

b) Show that the function $w = \frac{4}{z}$ transforms the straight line $x = c$ in the $Z-$ L2   6 M
plane into a circle in the $w-$ plane.

OR

8 a) If $f(z) = e^x(\cos ky + i\sin ky)$ is an analytic function, then find all the values   L1   6 M
of k

b) Find the bilinear transformation that maps the points $(1, i, -1)$ on to the points   L1   6 M
$(2, i, -2)$.

UNIT-V

9 Verify Cauchy's theorem for the function $f(z) = z + 1$ over the square with   L6   12 M
vertices at $z = 0, z = 1, z = 1 + i\,z = i$.

OR

10 Show that $\int_0^{2\pi}\left(\frac{1}{a+b\cos\theta}\right)d\theta = \frac{\pi}{\sqrt{a^2-b^2}}$, $a > b > 0$ L2   12 M

R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2023
PROBABILITY & STATISTICS
(Common to CSE, CSM, CIA & CAD)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1 a) The probability that students A,B,C,D solve the problem are $\frac{1}{3}$, $\frac{2}{5}$, $\frac{1}{5}$ and $\frac{1}{4}$ respectively If all of them try to solve the problem, what is the probability that the problem is solved.   L2   6M

b) Of the three, the chances that an IAS officer, IPS officer or an academician will be appointed as a vice-chancellor of a university are 0.7, 0.5, and 0.2 respectively. Probabilities that the outcome based education (OBE) is promoted by these if appointed are: 0.2, 0.5, and 0.7 respectively. If outcome based education is promoted, what is the probability that vice-chancellor is an academician?   L3   6M

OR

2 A random variable X has the following probability function

X	0	1	2	3	4	5	6	7
P(x)	0	K	2K	2K	3K	K²	2K²	7K²+K

Determine
(i) K
(ii) Evaluate P(X≥6) and P(0<X<5)
(iii) if P(X≤K)>1/2, find the minimum value of K
(iv) variance.   L2   12M

UNIT-II

3 a) If a coin is tossed 12 times, find the probability of getting
(i) at least two heads,
(ii) at most 3 heads,
(iii) between 5 to 8 heads and
(iv) all heads.   L2   6M

b) If the masses of 300 students are found to be normally distributed with mean 68 kg and SD 3 kg. How many students have masses
(i) Greater than 72 kg.
(ii) Less than or equal to 64 kg. and
(iii) Between 65 kg and 71 kg inclusive.   L3   6M

OR

4 a) If a Poisson distribution is such that $\frac{3}{2}P(X=1)=P(X=3)$, find (i) $P(X\geq1)$ (ii) $P(X\leq3)$ (iii) $P(2\leq X\leq5)$.   L3   6M

b) X is a normal variate with mean 30 and variance 25. Find the probabilities that (i) $26\leq X\leq40$ (ii) $X\geq45$ L3   6M

R20

UNIT-III

5 a) Find the median to the following data ;   L2   6M

Class intervals	40-50	50-60	60-70	70-80	80-90
frequency	5	12	23	8	2

b) Find mode to the following data   L2   6M

X	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40
F	5	7	10	18	20	12	8	2

OR

6 Ten competitors in a musical test were ranked by the three judges A,B and C in the following order   L3   12M

Ranks by A	1	6	5	10	3	2	4	9	7	8
Ranks by B	3	5	8	4	7	10	2	1	6	9
Ranks by C	6	4	9	8	1	2	3	10	5	7

Using rank correlation coefficient method, discuss which pair of judges has the nearest approach to common likings in music.

UNIT-IV

7 a) Obtain a relation of the form $y=ab^x$ for the following data by method of least squares   L3   6M

x	1	2	3	4
y	7	11	17	27

b) In a big city 325 men out of 600 men were found to be smokers. Does this information support the conclusion that the majority of men in this city are smokers?   L3   6M

OR

8 a) By the method of least squares fit a straight line to the following data ;   L3   6M

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

b) It is claimed that a random sample of 49 tyres has a mean life of 15200 km. This sample was drawn from a population whose mean is 15150 kms and standard deviation of 1200 km. Test the significance at 0.05 level.   L3   12M

UNIT-V

9 Two horses A and B were tested according to the time (in seconds) to run a particular track with the following results. Test whether the two horses have the same running capacity?   L3   12M

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	--

OR

10 Fit a Poisson distribution to the following data and hence test for its goodness of fit.   L3   12M

x	0	1	2	3	4	5	6	7
f	419	352	154	56	19	10	5	1

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SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2023
APPLIED PHYSICS
(ECE & EEE)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1	a)	State and explain principle of superposition.	L2	4M
	b)	Explain how the wavelength of light source is determined by forming Newton's rings.	L4	8M

OR

2	a)	Distinguish between Interference and Diffraction.	L4	4M
	b)	Explain the theory of Fraunhofer diffraction due to single slit	L2	8M

UNIT-II

3		Write Maxwell's equations in differential and integral form and derive expression for energy flow by electromagnetic waves.	L1	12M

OR

4	a)	State and Explain Gauss's theorem for divergence.	L4	6M
	b)	Describe the various sources of electrical resistance in metals.	L3	6M

UNIT-III

5	a)	Describe the important characteristic of laser beam.	L3	6M
	b)	Explain the difference between spontaneous and stimulated emission of radiation.	L4	6M

OR

6	a)	Explain the working principle of optical fiber.	L4	6M
	b)	Describe optical fiber communication system with block diagram.	L2	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.	L4	6M
	b)	Derive the expression for Einstein relation.	L4	6M

OR

8	a)	Describe the construction and working mechanism of Photodiode.	L3	8M
	b)	Determine the wavelength of LED fabricated by the CdS material with band gap of 2.42eV.	L3	4M

UNIT-V

9	a)	Explain the Type-I and Type-II superconductors.	L4	8M
	b)	Write the properties of Superconductors.	L1	4M

OR

10	a)	Explain Sol-Gel technique for synthesis of nanomaterials.	L4	8M
	b)	Write the applications of nanomaterials in different fields.	L3	4M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2023
ENGINEERING PHYSICS
(MECH)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1	a)	Explain the formation of Newton's ring with necessary theory with relevant diagram and derive the expression for diameter of dark and bright fringes.	L2	8M
	b)	Differentiate Interference and Diffraction of light.	L4	4M

OR

2	a)	Discuss Diffraction grating.	L2	6M
	b)	Derive the expression for wavelength light by using diffraction grating.	L3	6M

UNIT-II

3	a)	Explain the various types of crystal systems with a neat sketch and give examples.	L2	8M
	b)	List the important features of Miller indices.	L1	4M

OR

4	a)	Draw miller indices of planes for the following miller indices (1 0 0), (1 0 1) and (0 0 1).	L3	6M
	b)	State and explain Bragg's law of X-ray diffraction.	L2	6M

UNIT-III

5	a)	Discuss the basic requirements of an acoustically good hall.	L2	6M
	b)	Define the following terms: (a) Reverberation (b) Absorption coefficient (c) Pitch of the sound	L1	6M

OR

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

UNIT-IV

7	a)	Develop the relationship between different elastic moduli.	L3	6M
	b)	What is Hooke's law? Explain.	L2	6M

OR

8	a)	Classify different types of beams.	L2	8M
	b)	The Young's modulus for steel is $Y=2.1 \times 10^{11} N/m^2$ and its rigidity modulus $\eta=8 \times 10^{10} N/m^2$. Estimate the Poisson's ratio and its bulk modulus.	L5	4M

UNIT-V

9	a)	Prove that superconductor is a very good diamagnetic material.	L5	6M
	b)	Recall the various applications of superconductors.	L1	6M

OR

10	a)	Explain Sol-Gel technique for synthesis of nanomaterial.	L2	8M
	b)	List the various techniques for synthesizing nanomaterials.	L1	4M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2023
APPLIED CHEMISTRY
(Common to CSE, CSM, CAD & CIA)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1	Define Electrode Potential. Derive the Nernst equation for a single electrode potential and write its applications.	L3	12M

OR

2	Draw the neat sketch of electrochemical sensor; explain its construction, working principle and applications.	L3	12M

UNIT-II

3	a)	Explain Planck's Quantum Theory.	L2	6M
	b)	Explain Heisenberg Uncertainty principle	L2	6M

OR

4	What is Crystal field theory? Explain the crystal field splitting in octahedral and tetrahedral Complexes	L3	12M

UNIT-III

5	a)	Explain the Condensation or Step growth polymerization mechanism with examples	L3	6M
	b)	Explain the Cationic addition polymerization mechanism	L3	6M

OR

6	a)	Distinguish between Thermoplastics and Thermosetting plastics.	L4	6M
	b)	Describe the preparation, properties and uses of Bakelite.	L3	6M

UNIT-IV

7	Explain the working principle of Atomic Absorption spectrometer (AAS) and How will you determine the nickel using by AAS?	L2	12M

OR

8	Describe the various methods for separating the Liquid Mixtures?	L3	12M

UNIT-V

9	Explain in detail about principle and application of semiconductors?	L2	12M

OR

10	Write a brief note on Fullerenes and Carbon nano tubes	L1	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2023
ENGINEERING GRAPHICS
(CE,CSE,CSM,CIA & CAD)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

| 1 | The vertex of a hyperbola is 60 mm from its focus. Draw the curve, if the eccentricity is 3/2. Draw a normal and a tangent at a point on the curve, 75 mm from the directrix. | L1 | 12M |

OR

| 2 | Draw an Epi-cycloid of rolling circle of diameter 40 mm which rolls outside another circle (base circle) of 150 mm diameter for one revolution and construct a tangent and normal at any point on the curve. | L3 | 12M |

UNIT-II

| 3 | A point A is 20mm above the HP and 50mm in front of the VP. Another point B is 40mm below the HP and 15mm behind the VP. The distance between the projectors of the points, measured parallel to xy, is 75mm. Draw the projections of the points. Draw lines joining their FVs and TVs | L3 | 12M |

OR

| 4 | A Line EF 85mm long has its end E is 25mm above HP and 20mm infront of VP. The top and front views of the line have lengths of 55mm and 70mm respectively. Draw the projections of the line and Find its true inclinations with VP & HP. | L3 | 12M |

UNIT-III

| 5 | An equilateral triangular plane ABC of side 40mm has its plane parallel to VP and 20mm away from it. Draw the projections of the plane when one of its sides is (i) perpendicular to HP (ii) parallel to HP and (iii) inclined to HP at an angle of 45°. | L3 | 12M |

OR

| 6 | A cylinder of base diameter 5omm and axis 70 mm has a generator in the VP and inclined at 45° to the HP. Draw its projections | L3 | 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 450 to HP and passing through top corner. Draw the front and sectional top views of the solid and true shape of the section. | L3 | 12M |

OR

| 8 | A cone of base 50 mm diameter and height 65 mm rests with its base on HP. A section plane perpendicular to VP and inclined at 300 to HP bisects the axis of the cone. Draw the development of the lateral surface of the truncated cone. | L3 | 12M |

UNIT-V

| 9 | Draw the isometric projection of a hexagonal prism of base side 30 mm and axis 70mm. The prism rests on its base on the HP with an edge of the base parallel to the VP. | L3 | 12M |

OR

| 10 | Draw thre views of the blocks shown pictorially in figure according to first angle projection | L3 | 12M |
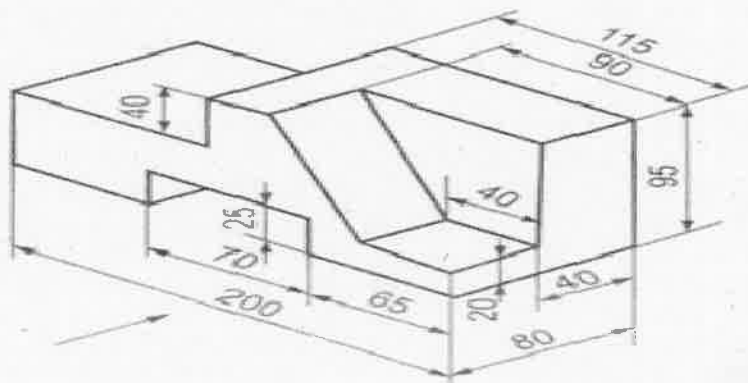
SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supple Examinations April-2023
C PROGRAMMING AND DATA STRUCTURES
(ECE,EEE& MECH)

Time: 3 Hours

Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1	a)	Describe the Structure of C Program with neat diagram.	L2	6M
	b)	Define a Variable. What are the rules for declaring a variable?	L4	6M

OR

2	Examine with examples of different decision statements in C.	L4	12M

UNIT-II

3	a)	Determine various types of Arrays with examples.	L5	6M
	b)	Write a C program for factorial of a given number using recursion.	L3	6M

OR

4	a)	Describe the any two storage classes with example.	L3	6M
	b)	What is recursion? Mention advantages and disadvantages of recursion.	L1	6M

UNIT-III

5	a)	Define structure and give the general syntax for structure. Write suitable Example program.	L1	6M
	b)	What are the features of pointers? Write a C program to print address of a variable.	L1	6M

OR

6	a)	Write briefly about dynamic memory management functions in C.	L5	6M
	b)	What is the use of period operator? Give an example.	L1	6M

UNIT-IV

7	What is a queue? What are various operations that can be performed on them? Explain with an example.	L2	12M

OR

8	Implement the following single linked list operations: a) Insertion of a node b) Deletion of a node c) Searching an element	L6	12M

UNIT-V

|			
9	Discuss the algorithm to sort the elements using exchange sort.	L2	12M

OR

10	What is binary search? Find the number 77 from the following set of numbers using binary search: 6, 12, 17, 23, 38, 45, 77, 84, 90.	L3	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2023
FUNDAMENTALS OF ELECTRICAL CIRCUITS
(EEE)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)
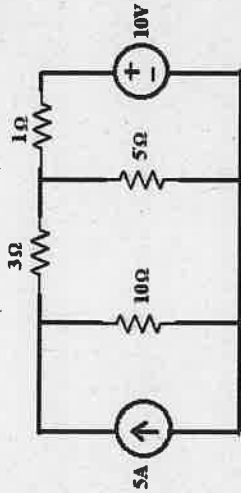
UNIT-I

1 a) Find the RMS value for the following waveform   L2   6M
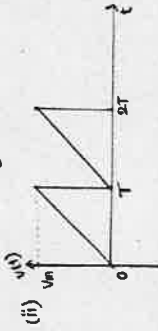
   b) Explain the phasor relation for R, L & C elements.   L4   6M

OR

2 a) Determine the current in 10Ω resistor for the following network by using KCL   L3   8M

   b) Explain about Ideal and Practical Current sources in detail   L2   4M

UNIT-II

3 a) State &explain Super position theorem   L1   6M
   b) State &explain Thevenir's theorem   L1   6M

OR

4 a) State and prove Compensation theorem.   L3   6M
   b) Verify Tellegen's theorem for the circuit shown in below figure.   L3   6M

UNIT-III
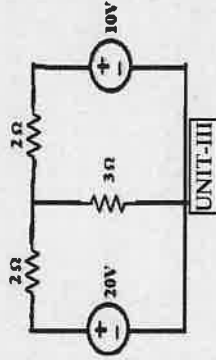
5 a) State &explain Milliman's theorem   L3   6M
   b) Find the Norton's equivalent for the circuit shown below.   L3   6M

OR

6 a) Explain about Quality factor and Band-width of Series resonance.   5M
   b) Find the value of 'L' at which the circuit resonates at a frequency of 1000 rad/sec in the circuit shown in figure.   L4   7M
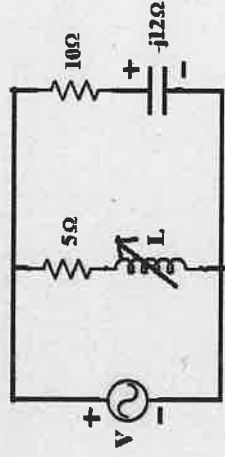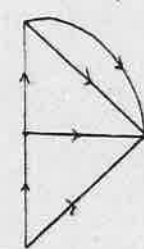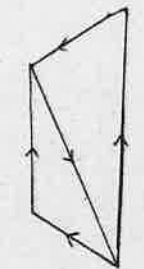

UNIT-IV

7 a) Derive the expressions for mutual inductance with expressions   L3   6M
   b) Two coupled coils have a self-inductances 37.5 mH and 193 mH, with the mutual inductance of 63.75mH. Find the co efficient of coupling.   L3   6M

OR

8 a) Explain series connection of coupled inductors   L4   6M
   b) Two coils connected in series have a self-inductance of 20mH and 60mH respectively. The total inductance of the combination was found to be 100mH. Determine the amount of mutual inductance that exists between the two coils (a) aiding each other,(b) opposing   L4   6M

UNIT-V

9 Find the tie-set matrix for the followings?   L3   12M
   a)
   b)

OR

10 Write the procedure to draw the dual network and find dual network for the following   L4   12M
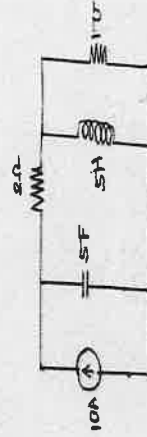
SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2023
FUNDAMENTALS OF DIGITAL COMPUTING SYSTEMS
(ECE)

Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

| 1 | a) | Sketch the IPO model and describe its functional blocks. | L3 | 6M |
| | b) | What is operating system? Explain its basic services | L2 | 6M |

OR

| 2 | a) | What are the major considerations and factors that would be important while buying a computer? | L2 | 6M |
| | b) | Explain about protocols and standards | L2 | 6M |

UNIT-II

| 3 | a) | Explain the top-down approach in IT system architecture. | L2 | 4M |
| | b) | With the help of diagrams, explain how Google designed its IT system architecture to achieve its mission. | L2 | 8M |

OR

| 4 | a) | What is the primary mission of Google? | L2 | 4M |
| | b) | Explain the classification of services provided by cloud computing. | L2 | 8M |

UNIT-III

| 5 | a) | Explain various number systems used in computers | L2 | 6M |
| | b) | Convert the following binary numbers in to decimal (i) $(1101100100)_2$ (ii) $(001001001101)_2$ (iii) $(110110110110)_2$ | L3 | 6M |

OR

| 6 | a) | Explain the process of converting base 3 numbers in to base 6 numbers with an example | L3 | 6M |
| | b) | $(3452)_8$ (ii) $(555)_8$ (iii) $(4676)_8$ | L3 | 6M |

UNIT-IV

| 7 | | Discuss the features and Characteristics of .MP3 and .WAV audio file formats | L2 | 12M |

OR

| 8 | | Explain pseudocode procedure that performs string conversion to number. | L2 | 12M |

UNIT-V

| 9 | a) | Calculate the sum of two BCD numbers 687 and 954 | L3 | 6M |
| | b) | What is the drawback with 1's complement and how is it overcome by 2's complement? | L2 | 6M |

OR

| 10 | | How is a floating point number represented in IEEE 754 format? Explain multiplication of two numbers in IEEE 754 format. | L3 | 12M |

UNIT-I

1 a) Classify different system of forces with suitable examples. L4 6M
   b) The resultant of the two forces, when they act at an angle of 60° is 14 N. If the same forces are acting at right angles, their resultant is √137 N. Determine the magnitude of the two forces. L3 6M

OR

2 A simply supported beam AB of span 6 m is loaded as shown in Fig. Determine the reactions at A and B. L3 12M
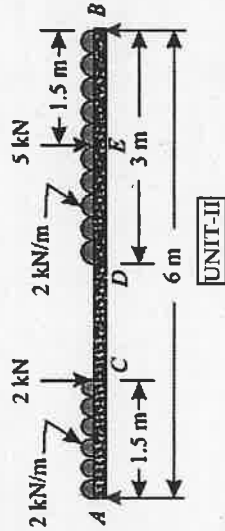
UNIT-II

3 Define the following: L1 12M
(a) Limiting Force of Friction
(b) Kinetic Friction
(c) Co-efficient of Friction
(d) Angle of Friction
(e) Angle of Repose

OR

4 A screw jack raises a load of 40 kN. The screw is square threaded having three threads per 20 mm length and 40 mm in diameter. Calculate the force required at the end of a lever 400 mm long measured from the axis of the screw, if the coefficient of friction between screw and nut is 0.12. L3 12M

UNIT-III

5 An I-section is made up of three rectangles as shown in Fig .Find the Centroid of the section. L3 12M

OR
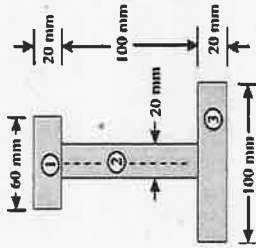
6 Find the Centre of gravity of a channel section 100 mm × 50 mm × 15 mm as shown in Fig. L3 12M
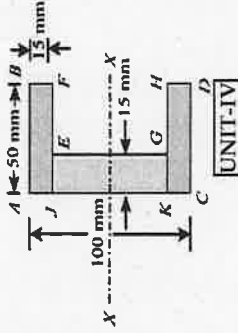
UNIT-IV

7 Derive an equation for moment of inertia of the following sections about Centroidal axis; (a) A rectangular section (b) A triangular section from its base L3 12M

OR

8 Find the moment of inertia about the centroidal X-X and Y-Y axes of the angle section shown in Fig L3 12M
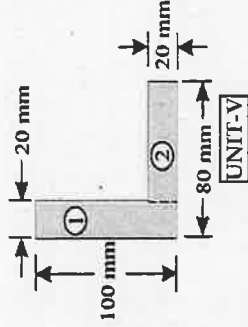
UNIT-V

9 Determine the forces in all the members of the truss shown in Fig L1 12M

OR
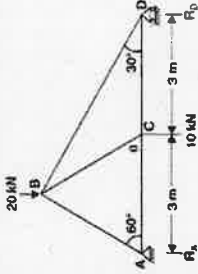
10 a) What is a cantilever truss? How will you find out its reactions L1 12M
    b) State the assumptions made in the analysis of pin jointed trusses.
    c) How method of joint differs from the method of section in the analysis of pin jointed trusses
    d) What is meant by Perfect frame
    e) What are the types of Vibrations.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2023
DIGITAL LOGIC DESIGN
(Common to CSE, CSM, CAD & CIA)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1 a) Solve the following   L1   6M
i) $(87.125)_{10} = (\ )_{16}$ ii) $(37.6875)_{10} = (\ )_8$ iii) $(147.75)_8 = (\ )_{10}$

b) Perform the subtraction using 2's complement method.   L3   6M
(i)11000 – 10011.01 (ii)10010 – 1101 (iii)111.01 - 110000

OR

2 a) Simplify the following Boolean expressions to a minimum number of literals   L4   6M
and Draw logic diagrams of the circuits that implement the original and
simplified expressions
i) $X'Y + X'Y'$ ii) $XYZ + X'Y + XYZ'$ iii) $(A + B)'(A' + B')'$

b) Define Standard form and Canonical form and Convert each of the   L2   6M
following to the other canonical form
(i)$F(x, y, z) = \sum m(0, 1, 2)$ (ii) $F(A, B, C, D) = \pi M(3, 5, 9, 10)$

UNIT-II

3 a) Explain the following in brief.   L1   6M
i. Don't care conditions ii. Redundant group iii. Prime Implicant.

b) Obtain minimal POS expression for the Boolean function using K-Map   L4   6M
method. $F(A,B,C,D)=\Pi(0,1,2,4,8,9,10)+d(7,11,13,15)$.

OR

4 a) Explain OR-AND-INVERT realization of function with example   L2   6M
b) Design Parity Generator and Checker using Exclusive-OR function   L3   6M

UNIT-III

5 a) Define Binary adder and explain using a suitable example.   L1   6M
b) Design and Implement a 2-bit Magnitude comparator   L3   6M

OR

6 a) Explain the functionality of a binary Multiplier with an example   L2   6M
b) Design 1:8 demultiplexer using two 1:4 demultiplexer.   L3   6M

UNIT-IV

7 a) Draw the logic diagram of D-flip flop and explain   L2   6M
b) Explain in detail about ripple counter using suitable diagram.   L2   6M

OR

8 a) Design a 3-bit Synchronous UP/DOWN Counter.   L3   6M
b) Explain in detail about Johnson counter   L2   6M

UNIT-V

9 a) Design and Implement the following Boolean expressions using   L5   6M
PROM F1(A,B,C)=Σ(m(0,2,4,7), F2(A,B,C)=Σm(1,3,5,7)

b) Define and distinguish between PROM, PLA and PAL.   L4   6M

OR

10 a) What is RAM? Design a 4 X 4 RAM.   L1   6M
b) Design and Implement the following Boolean function using PLA: L5   6M
F1(A,B,C)=Σm(3,5,6,7), F2(A,B,C)=Σm(0,2,4,7)

Q.P. Code: 20HS0810   R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2023
Communicative English
(CE,CSE,CSM,CAD&CIA)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1 a) Write a letter to the principal for bringing about some improvement in the working of school   L1   6M
library.
  b) Explain in detail the themes of the essay *Half a Rupee Worth* by R K Narayan.   L3   6M

OR

2 a) What is the effect of positive thinking and positive attitude in life? How do you maintain a   L2   6M
positive attitude?
  b) Sketch the character of Subbiah from *Half a Rupee Worth* by R K Narayan.   L4   6M

UNIT-II

3 a) Elucidate the mechanics of writing.   L2   6M
  b) How many wells were mentioned in the story *The Thakur's Well* and what does the well   L2   6M
symbolize?

OR

4 a) Is mindset a factor that can influence perception? Explain with examples.   L2   6M
  b) Critically review the story *The Thakur's Well* by Munshi Premchand.   L3   6M

UNIT-III

5 a) You are Sangeeth/Sangeetha an active member of the Animal Lovers Club which works for the   L1   6M
welfare of animals by preventing cruelty to them. Recently you visited Mahatma Gandhi Animal
Care Home. You were pleasantly surprised to see the good treatment given to the animals. Write a
report in 120 – 150 words on your visit.
You may use the following points: injured dogs and cats – abandoned pets – very old animals – all
very well cared for – well-equipped medical room – veterinary surgeon – green surroundings.
  b) Analyse *I am not that Woman* by Kishwar Naheed from a feminist perspective.   L4   6M

OR

6 a) Write a note on Emotional Intelligence.   L3   6M
  b) Who is the commodity traded in the poem *I am not that Woman*?   L3   6M

UNIT-IV

7 a) Fill in the blanks with the proper degrees of comparison: L2   6M
    1. No other boy is as .... as John. (tall/taller/tallest)
    2. A train is .... than a car. (fast/faster/fastest)
    3. Milk is .... than any other food. (nourishing/more nourishing/most nourishing)
    4. Solomon was the ....: king. (wise/wiser/wisest)
    5. Gold is one of the .... metals. (precious/more precious/most precious)
    6. Martin speaks English .... (well/better/best)
  b) Summarize *What is my Name?* by Sathyavathi.   L2   6M

OR

8 a) In what ways can students use time management?   L2   6M
  b) Discuss the central theme of *What is my Name?* by Sathyavathi.   L2   6M

UNIT-V

9 a) Identify the errors in the following sentences and correct them: L2   6M
    1. It is raining when I got home last night.
    2. I have not ate anything today.
    3. If I am a child, I would play outside.
    4. Everyone have seen that movie.
    5. Look! It is snow.
    6. He can speak Chinese because he was born in Canada.
  b) How did Kalam's father explain the meaning of prayer?   L3   6M

OR

10 a) What is goal setting in soft skills?   L2   6M
   b) What is the power of prayer according to APJ Abdul Kalam?   L2   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2023
ELCECTRONIC DEVICES AND CIRCUITS
(EEE)

Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (**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.	L3	6M
	b)	Analyze the current components of a PN Junction Diode and derive the diode current equation.	L4	6M

OR

2	a)	Derive the expression for transition capacitance of a PN Junction Diode.	L3	8M
	b)	Define Transition and Diffusion capacitances of a PN Junction Diode.	L1	4M

UNIT-II

3	a)	Draw the circuit diagram of a Full Wave Rectifier and with the help of waveforms describe its operation.	L2	6M
	b)	A Half Wave Rectifier is supplied from a 230V, 50 Hz supply with a step-down ratio of 3:1 to a resistive load of 10kΩ. The diode forward resistance is 75Ω while transformer secondary is 10Ω. Calculate maximum, average, RMS values of current, DC output voltage, efficiency of rectification and ripple factor.	L4	6M

OR

4	a)	With neat circuit diagram and waveforms, explain the operation of Full Wave Rectifier with Capacitor filter and derive the expression for its ripple factor.	L2	6M
	b)	Demonstrate the working principle of LC filter with neat circuit diagram and derive the expression for its ripple factor. List the advantages and disadvantages	L2	6M

UNIT-III

5	a)	Explain the operation an NPN transistor.	L2	6M
	b)	Explain the current components of a PNP transistor.	L2	6M

OR

6	a)	With a neat diagram, Explain how a transistor acts as an amplifier.	L2	6M
	b)	With neat diagram, explain the Input and Output characteristics of a BJT in CB Configuration. Explain Early effect.	L2	6M

UNIT-IV

7	a)	Explain Diode Compensation Technique for the parameters of VBE and ICO.	L2	6M
	b)	Illustrate Thermistor Compensation Technique for stabilization against variations in Q-point.	L3	6M

OR

8	a)	Estimate the condition for achieving Thermal Stability.	L4	6M
	b)	If the various parameters of a CE amplifier which uses the self bias method are VCC=12v, R1=10KΩ,R2=5KΩ,Rc=1KΩ, RE=2KΩ &β=100, find the operating point. Assume Si Transistor.	L3	6M

UNIT-V

9	a)	Draw the hybrid model for a transistor in CE configuration and derive its hybrid parameters.	L1	6M
	b)	Using low frequency h-parameter model, Evaluate the expressions for voltage gain, current gain, input impedance and output admittance for a BJT Amplifier in CE configuration.	L4	6M

OR

10	a)	With neat diagram, summarize the parameters of CE amplifier using approximate analysis.	L2	6M
	b)	Examine the expressions for current gain, voltage gain, input impedance and output impedance of CB amplifier using simplified hybrid model.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2023
ELECTRICAL TECHNOLOGY
(ECE)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1 a) Derive expression for generated EMF of a D.Cgenerator.   6M
     b) A 4 pole lap wound DC generator has 90 slots and each slots has 6 conductors find   6M
         the EMF induced if the generator rotates at 1500 rpm and the flux per pole is 3 mwb.

OR

2 a) A six pole, lap wound armature has 840 conductors and flux per pole of 0.018wb.   6M
         Calculate the EMF generated, when the machine in running at 600 rpm.
     b) Explain the procedure of voltage building of DC self-excited generator   6M

UNIT-II

3 a) What is Back E.M.F? And derive the equation for back emf.   6M
     b) A250V motor has an armature circuit resistance of 0.5ohms.If the full load armature   6M
         current is 25A. Find the back EMF induced in the armature.

OR

4 What are the different types of DC motors Explain in detail?   12M

UNIT-III

5 A 5KVA, 500/250V, 50Hz, single –phase transformer gave the following results: 12M
    O.C Test: 500V, 1A, 50W (HV Side is opened)
    S.C Test: 25V,10A,60W (LV Side is shorted)
        Determine:
        (i) The Efficiency on Full-load, 0.8 lagging P.F.
        (ii) The Voltage Regulation on Full-load 0.8 lagging P.F. The Efficiency on 60%of
            Full-load, 0.8laggingP.F.

OR

6 What is the Procedure for conducting O.C. and S.C test on a single-phase transformer,   12M
    explain with neat diagram.

UNIT-IV

7 Explain the principle of operation of 3-phase induction motor with neat sketch   12M

OR

8 Explain constructional features of 3 phase induction motor   12M

UNIT-V

9 A 3-phase, 50 Hz, star connected 2000 KVA, 2300V alternator has an effective   12M
    resistance of 0.12Ω   and gives a short circuit current of 600A for a certain field
    excitation. With the same excitation, the open circuit voltage was 900V.Calculate: i)
    The synchronous impedance and reactance ii) The full load regulation when the
    power factor is 0.8 lagging iii) The full load regulation when the power factor is 0.6
    leading.

OR

10 Explain the theory of operation of synchronous machine.   12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations April-2023
BASIC THERMODYNAMICS
(MECHANICAL ENGINEERING)

Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (**5 x 12 = 60 Marks**)
Steam Tables and Mollier diagram shall be allowed.

UNIT-I

1	a)	Describe thermodynamic process, Cycle and types of thermodynamic cycles with the help of neat sketches.	L2	6M
	b)	Distinguish between point and path functions. Prove, heat addition is a path function.	L3	6M

OR

2 a) Derive expressions for the work done for Isothermal process. — L3 — 6M

b) A piston and cylinder machine containing a fluid system has a stirring device in the cylinder (Fig a.) The piston is frictionless and it is held down against the fluid due to the atmosphere pressure of 101.32 kPa. The stirring device is turned 10000 revolutions with an average torque against the fluid of 1.275 mN. Meanwhile the piston of 0.6 m diameter moves out 0.8 m. Find the net work transfer for the system. — L4 — 6M
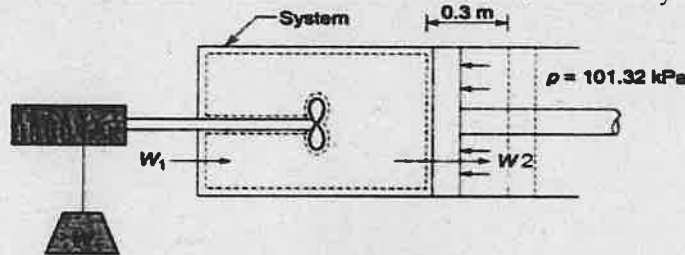
Fig a.

UNIT-II

3 a) Define first law of thermodynamics. Derive an expression for Mass balance for a steady flow process. — L2 — 6M

b) In a steady flow apparatus 135 kJ of work is done by each kg of fluid. The specific volume of the fluid, pressure, and velocity at the inlet are 0.37 m^3/kg, 600 kPa, and 16 m/s. The inlet is 32 m above the floor and the discharge pipe is at floor level. The discharge conditions are 0.62 m^3/kg, 100 kPa and 270 m/s. The total heat loss between the inlet and discharge is 9 kJ/kg of fluid. In flowing through this apparatus, does the specific internal energy increase or decrease and by how much ? — L3 — 6M

OR

4 a) Describe equivalence of Kelvin-Planck and Clausius statements with the help of a sketch. — L3 — 6M

b) A cyclic heat engine operates between a source temperature of 800°C and a sink temperature of 30°C. What is the least rate of heat rejection per kW net output of the engine ? — L4 — 6M

UNIT-III

5 a) Derive an expression for entropy change of an Ideal Gas. — L2 — 6M

b) A certain gas has Cp = 1.968 and Cv = 1.507 kJ/kg K. Find its molecular weight and gas constant. A constant volume chamber of 0.3 m^3 capacity contains 2 kg of this gas at 5°C. Heat is transferred to the gas until the temperature is 100°C. Find the work done, the heat transferred and the changes in internal energy, enthalpy and entropy. — L4 — 6M

OR

6 a) Derive an expression of work output for Polytropic process. — L2 — 6M

b) 0.5 kg of air is compressed reversibly and Polytropically from 80 kPa, 60°C to 0.4 MPa. Calculate work output considering n = 1.3. — L3 — 6M

UNIT-IV

7 a) Derive an expression for air standard efficiency of Otto Cycle. — L2 — 6M

b) An engine working on Otto cycle is supplied with air at 0.1 MPa, 35°C. The compression ratio is 8. Heat supplied is 2100 kJ.kg. Calculate the maximum pressure and temperature of the cycle and cycle efficiency. (for air Cp = 1.005 kJ/kg Cv = 0.718 kJ.kg) — L4 — 6M

OR

8 a) Draw P-v diagram of water whose volume decreases on melting and explain salient features of pure substance referring to the diagram. — L2 — 6M

b) Estimate the specific enthalpy, specific entropy and specific volume of steam at 1.4 MPa, 380°C. — L3 — 6M

UNIT-V

9 a) Draw schematic layout, T - s diagram of reheat Rankine cycle. — L2 — 6M

b) A steam power station works on reheat Rankine cycle: Steam at boiler outlet is 150 bar, 550°C. Reheat at 40 ba 550°C. Condenser pressure is 0.1 bar. Calculate i) Quality of steam at turbine exit   ii) Cycle efficiency — L3 — 6M

OR

10 a) Derive an expression for Heat supplied using concept of mean temperature of heat addition on a Rankine cycle. — L2 — 6M

b) Steam at 20 bar, 360°C is expanded in a steam turbine to 0.08 bar. It then enters a condenser where it is saturated liquid water. Assuming ideal processes calculate net work and cycle efficiency. — L3 — 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations April- 2023
DIGITAL ELECTRONICS
(EEE)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1 a) Explain Different Types of binary codes and give there examples   L3   6M
   b) A receiver with even parity hamming code is received the data as   L3   6M
       1110110.Determine the correct code.
OR
2   What is Grey code? What are the rules to construct gray code? Develop   L1   12M
       the 4 bit gray code for the decimal 0 to 15

UNIT-II

3   Simplify the following Boolean expressions using K-map   L3   12M
       $F(A, B, C, D,E)= \Sigma m(0,2,4,6,9,11,13,15,17,21,25,27,29,31)$
OR
4   Minimize the given Boolean function   L2   12M
       $F(A,B,C,D) = \Sigma m(0,2,3,6,7,8,10,12,13)$ using tabulation method.

UNIT-III

5 a) Design 32:1 Mux using two 16:1 Muxs and one 2:1 Mux.   L3   6M
   b) What is magnitude comparator? Design 2-bit comparator by using logic   L1   6M
       gates

OR
6 a) What is Encoder? Design the circuit for Octal to Binary encoder with   L1   6M
       truth table.
   b) What is Demultiplexer? Desingn1:8 Demultiplexer using 1:4   L1   6M
       Demultiplexers.

UNIT-IV

7 a) Design MOD-10 Asynchronous counter by using T-Flip flop   L3   9M
   b) Explain about level and Edge triggering .   L1   3M
OR
8   Design and implement 3-bit ripple counter using J-K flip flop. Draw the   L3   12M
       state diagram, logic diagram and timing diagram for the same.

UNIT-V

9 a) Implement PLA circuit for the following functions   L3   6M
       $F1(A,B,C)= \Sigma m(3,5,6,7)$, $F2(A,B,C)= \Sigma m(0,2,4,7)$.
   b) Implement the following Boolean function using PAL.   L3   6M
       (i)$W(A,B,C,D) = \Sigma m(0,2,6,7,8,9,12,13)$
       (ii)$X(A,B,C,D) = \Sigma m(0,2,6,7,8,9,12,13,14)$
OR
10 a) What is FSM? What are the limitations of FSM? Give the applications of   L3   6M
       FSM.
   b) Explain about Memory decoding.   L3   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations April- 2023
CAD/CAM
(MECH)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1	a)	Explain the CAD Tools?	L2	6M
	b)	List the Evaluation criteria CAD standards	L1	6M

OR

2	Explain briefly about 2D and 3D transformations	L2	12M

UNIT-II

3	a)	Define the solid modeling and Explain any one type of solid modeling	L1	6M
	b)	Compare 2-D and 3-D wire frame models.	L2	6M

OR

4	a)	Explain about boundary representation approach.	L2	6M
	b)	What are the Fundamentals of solid modeling	L1	6M

UNIT-III

5	Illustrate about NC motion control systems.	L2	12M

OR

6	a)	Explain in detail about cutter radius compensation	L2	6M
	b)	Write a short notes on Manual part programming	L2	6M

UNIT-IV

7	a)	Explain about production flow analysis (PFA)	L2	6M
	b)	Write brief notes on Group Technology	L1	6M

OR

8	Explain the components of FMS with a neat sketch	L2	12M

UNIT-V

9	Illuminate MRP-II with neat sketch and also write its benefits.	L2	12M

OR

10	a)	Brief about the shop floor control	L1	6M
	b)	Explain the function of shop floor control	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations April- 2023
CONTROL SYSTEMS
(ECE)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1 a) For the electrical system shown in Fig, find the transfer function.   L3   6M
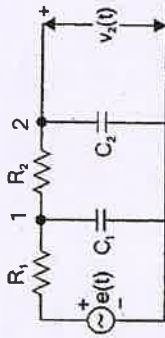
b) Convert the block diagram shown in fig 1, to signal flow graph and determine the transfer function C(S)/R(S).   L3   6M
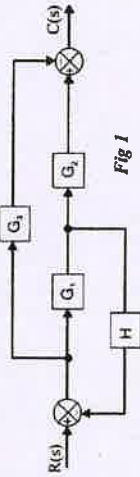
Fig 1

OR

2 Find the overall transfer function of the system whose signal flow graph is shown in fig 1.   L4   12M

Fig 1

UNIT-II
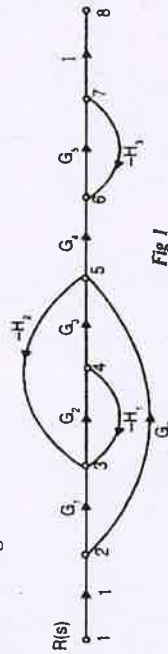
3 Find all the time domain specifications for a unity feedback control system whose open loop transfer function is given by $G(S) = \frac{25}{s(S+5)}$.   L2   12M

OR

4 A positional control system with velocity feedback shown in fig. What is the response c(t) of the system for unit step input?   L5   12M
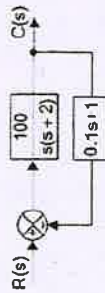
Fig 1 : Positional control system.

UNIT-III

5 a) With the help of Routh's stability criterion find the stability of the following systems represented by the characteristic equations   L2   6M
$s^4 + 8 s^3 + 18 s^2 + 16s + 5 = 0$.

b) $s^6 + 2s^5 + 8s^4 + 12s^3 + 20s^2 + 16s + 16 = 0$ L3   6M

OR

6 Find the range of K for stability of unity feedback system whose open loop transfer function is $G(s) = \frac{K}{s(S+1)(S+2)}$ using Routh's stability criterion   L3   12M

UNIT-IV

7 Develop the Bode plot for the following transfer function and determine the system phase and gain cross over frequencies   L4   12M
$G(s) = \frac{10}{s(1+0.4S)(1+0.1S)}$

OR

8 a) Determine the transfer function of Lag Compensator and draw pole-zero plot.   L3   6M

b) Determine the transfer function of Lead Compensator and draw pole-zero plot.   L3   6M

UNIT-V

9 a) Define state, state variable, state equation   L1   6M

b) Derive the expression for the transfer function from the state model.   L3   6M
$\dot{X} = Ax + Bu$ and $y = Cx + Du$

OR

10 Find a state model for the system whose Transfer function is given by   L1   12M
$G(s) \, H(s) = \frac{(7s^2 + 12s + 8)}{(s^3 + 6s^2 + 11s + 9)}$

R20

UNIT-V

9	a)	Solve the recurrence relation using substitution method. $a_n = a_{n-1}+3n^2+3n+1$ where a0=1.	L2 6M
	b)	Solve the recurrence relation $a_n - 6a_{n-1} + 9 a_{n-2} =0$ for n ≥ 2, given that a0=0, a1=12 by generating functions method.	L2 6M
		OR	
10	a)	Find the sequences generated by the following function: $(x+3)^3$.	L1 6M
	b)	Find the generating function for following sequence: 1,1,0,1,1.....	L1 6M

R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

**B.Tech II Year II Semester Supplementary Examinations April- 2023**

DISCRETE MATHEMATICS
(CSE)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1	a)	Explain Euler's formula with an example	L2 6M
	b)	If G is a non-directed graph with 12 edges. Suppose that G has 6 vertices of degree 3 and the rest have degree less than 3. Determine the minimum number of vertices.	L3 6M
		OR	
2	a)	What is BFS? Explain with an example.	L2 6M
	b)	Define the following terms with examples. i) Euler circuit ii) Hamiltonian cycle	L2 6M

UNIT-II

3	a)	What is Tautology? Prove that the following statement is tautology or not. $((P{\to}R)\wedge(Q{\to}R)) \to ((PVQ) {\to}R)$	L5 6M
	b)	Show that $(\sim P \wedge (\sim Q \wedge R))V(Q\wedge R)V(P\wedge R)<=>R$	L2 6M
		OR	
4	a)	Obtain the principle disjunctive normal form of the propositional formula: $(\sim P{\to}R) \wedge (Q{\leftrightarrow}P)$.	L3 6M
	b)	Define statement and explain various connectives with example.	L2 6M

UNIT-III

5	a)	Define Group and explain the properties of a group.	L2 6M
	b)	Show that every cyclic group of order n is isomorphic to the group $<z_n, t_n>$	L3 6M
		OR	
6	a)	Draw the Hasse diagram for the partial ordering ʻ{(A,B)	A ⊆ B} on the power set P(S) where S = {a, b, c,d}.	L2 6M
	b)	Show that the set G = {1, −1, i, −i} where i = −1 is an abelian group with respect to multiplication as a binary operation.	L2 6M

UNIT-IV

7	a)	State Principle of Inclusion-Exclusion with example.	L5 6M
	b)	How many different license plates are there that involve 1,2 or 3 letters followed by 4 digits?	L2 6M
		OR	
8	a)	How many poker hands of five cards can be dealt from a standard deck of 52 cards? Also, how many ways are there to select 47 cards from a standard deck of 52 cards?	L2 6M
	b)	The English alphabet contains 21 consonants and five vowels. How many strings of six lowercase letters of the English alphabet contain a) exactly one vowel? b) exactly two vowels? c) at least one vowel? d) at least two vowels?	L2 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations April-2023
ENTREPRENEURSHIP DEVELOPMENT
(Common to EEE, MECH & ECE)

Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1	a)	What are the qualities of Entrepreneurship?	L1	6M
	b)	Briefly explain the elements of social entrepreneurship.	L3	6M

OR

2	a)	What are the Challenges faced by entrepreneurs in India?	L2	6M
	b)	Briefly explain various types of entrepreneurs.	L3	6M

UNIT-II

3	a)	How are MSMEs helpful in contributing to Economic Development?	L4	6M
	b)	List out the advantages and disadvantages of sole proprietorship.	L3	6M

OR

4	a)	Briefly explain classification of MSMEs.	L3	6M
	b)	If you start a business, which form of ownership would you prefer and why?	L5	6M

UNIT-III

5	a)	Examine the importance of Innovation in Entrepreneurship	L4	6M
	b)	What are the intellectual property rights and its importance?	L1	6M

OR

6	a)	Outline the sources of new ideas generation for new product to improve your business.	L4	6M
	b)	Write short notes on the products that secured Trade mark and copy rights.	L2	6M

UNIT-IV

7	a)	Relate the motivational factors influencing the entrepreneurs.	L3	6M
	b)	What are the sources of financing?	L1	6M

OR

8	a)	What are the Opportunities for entrepreneurship in present scenario?	L1	6M
	b)	Elucidate the role of consultancy organizations.	L2	6M

UNIT-V

9	a)	How do you design a project? Explain its steps.	L3	6M
	b)	What is the need of project designing?	L1	6M

OR

10	a)	How does Project management help the entrepreneur in entrepreneurship?	L3	6M
	b)	What is meant by Project preparation?	L1	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations April-2023
MICROPROCESSORS AND MICROCONTROLLERS
(CSE)

Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1	a)	Draw the block diagram of the microcomputer and explain the function of each Block.	L1	6M
	b)	Illustrate with a neat sketch, how the microprocessor can be used in Microprocessor Controlled Temperature System (MCTS).	L3	6M

OR

2	a)	Differentiate the Microprocessor & the Microcontroller with a suitable diagram.	L2	6M
	b)	Give examples of output devices and discuss the concept of output devices in detail.	L3	6M

UNIT-II

3	a)	Draw the pin diagram of the 8085 microprocessor and categorize the pins based on function.	L6	6M
	b)	List out the important features of 8085 microprocessor.	L1	6M

OR

4	a)	Explain the Data transfer instructions of the 8085 microprocessor with an Example.	L1	6M
	b)	Define an interrupt and explain the different types of interrupts available in the 8085 microprocessor.	L2	6M

UNIT-III

5	a)	Draw the pin diagram of 8051 microcontroller and describe the functionality of each pin in detail.	L6	8M
	b)	Compare serial communication and parallel communication.	L4	4M

OR

6	a)	Explain how the 8051 microcontroller transfers the serial data input and output using UART.	L1	6M
	b)	Explain SBUF register.	L1	6M

UNIT-IV

7	a)	Explain Jump and Call instructions of 8051 microcontroller with an example.	L2	6M
	b)	Compare CALL and PUSH instructions.	L3	6M

OR

8	a)	Develop and write an assembly program of 8051 microcontroller to divide two 8-bit numbers and store the result in a memory location.	L3	6M
	b)	Explain Jump and Call instructions of 8051 microcontroller with an example.	L1	6M

UNIT-V

9	a)	Describe the key bouncing problem and de-bouncing solutions.	L2	6M
	b)	Explain the commands used before sending data to 16x2 LCD display.	L1	6M

OR

10	a)	With a neat sketch, show the interfacing of a 4x4 matrix keypad with an 8051 microcontroller.	L3	6M
	b)	List instruction command codes for programming an LCD.	L2	6M

R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations April 2023
ELECTRICAL POWER TRANSMISSION SYSTEM
(EEE)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1	a)	Explain the concept of GMR and GMD in single and double circuit lines	L2	6M
	b)	Determine the inductance per km per phase of a single circuit 20kVline of the given configuration as shown in fig. The conductors are transposed and have a diameter of 4.5cm.	L3	6M

4.5 cm

5.5 m   5.5 m
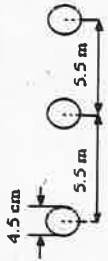
OR

2	a)	What is the necessity of transposition in transmission lines?	L1	6M
	b)	Find the inductance per km of a three-phase transmission line using 1.16cm diameter conductors when these are placed at thecorners of an equilateral triangle of each side 3m.	L3	6M

UNIT-II

3	a)	Prove the relation AD-BC=1 by considering a two-terminal pair network for the nominalT-method.	L5	6M
	b)	Explain the Ferranti effect in transmission lines.	L2	6M

OR

4		Derive the equations for sending voltage and the current using the nominal-II method with a neat phasor diagram.	L3	12M

UNIT-III

5		What are the factors affecting corona? And derive the expressions for critical disruptive and visual critical voltage	L4	12M

OR

6	a)	What is corona ? Explain the formation of corona briefly.	L1	6M
	b)	Determine the corona of a 3-phase line 160km long, conductor diameter 1.036cm, 2.44m delta spacing, air temperature 26.67oC, altitude 2440m, corresponding to an approximate barometric pressure of 73.15cm of Mercury, operating voltage 110kv at 50Hz. Assume data if required.(irregularity factor etc.)	L3	6M

UNIT-IV

7	a)	Draw and explain the stringing chart	L1	6M
	b)	An overhead transmission line at a river crossing is supported from two towers at heights of 50m and 100 m above water level. The horizontal distance between the towers being 300m.If the allowable tension is 2000kg, find the clearance between the conductor and water at a point mid-way between the towers. Weight of conducor is 1kg/m	L4	6M

R20

OR

8		An overhead transmission line has a span of 200m between level supports. The conductor has a cross sectional area of 3 cm². The ultimate strength is 5000 kg/cm² and safety factor is 5. The specific gravity of the material is 8.9 gm/cc. wind pressure is 1.5 kg/m . calculate the height of the conductor above the ground level at which it should be supported if a minimum clearance of 8m is to be left between the ground and conductor.	L4	12M

UNIT-V

9	a)	Distinguish between Underground cables and overhead lines.	L3	6M
	b)	Explain the pressure cables with a neat sketch.	L3	6M

OR

10		Explain the construction of underground cables	L2	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations April-2023

THEORY OF MACHINES
(MECHANICAL ENGINEERING)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1	a)	Discuss the effect of gyroscopic couple on a 2 wheeled vehicle when taking a turn.	L2 6M
	b)	Explain the gyroscopic effect of pitching and rolling of a ship in the sea water.	L2 6M

OR

2		The radius of gyration of a fly wheel is 1 meter and the fluctuation of speed is not to exceed 1% of the mean speed of the flywheel. If the mass of the flywheel is 3340 kg and the steam engine develops 150 kW at 135 rpm, then find (i) maximum fluctuation of energy and (ii) coefficient of fluctuation of energy.	L3 12M

UNIT-II

3	a)	Explain about cone clutch with neat sketch	L2 6M
	b)	Explain the function of Absorption type Dynamometer	L2 6M

OR

4		An engine developing 45 kW at 1000 rpm is fitted with a cone clutch built inside a fly wheel. The cone has a face angle of 12.5° & maximum mean diameter of 500 mm. The co-efficient of friction is 0.2. The normal pressure on the clutch face is not to exceed 0.1 N/mm². Determine. i. The axial spring force necessary to engage to clutch. ii The face width required	L3 12M

UNIT-III

5		A Hart-Nell governor having a central sleeve spring and two right angled bell crank levers operates between 290 rpm and 310 rpm for a sleeve lift of 15 mm. The sleeve and ball arms are 80 mm and 120 mm respectively. The levers are pivoted at 120 mm from the governor axis and mass of each ball is 2.5 kg. The ball arms are parallel at lowest equilibrium speed. Determine (i) loads on the spring at maximum and minimum speeds, and (ii) stiffness of the spring.	L3 12M

OR

6	a)	What are the effects of friction and of adding a central weight to the sleeve of a watt Governor?	L2 4M
	b)	A porter governor has equal arms each 250 mm long and pivoted on the axis of rotation. Each ball has a mass of 5 kg and the mass of the central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift and 200 mm when the governor is at maximum speed. Find the minimum and maximum speeds and range of speed of the governor	L3 8M

UNIT-IV

7		A four cylinder vertical engine has cranks 150 mm long. The plane of rotation of the first, second and fourth cranks are 400 mm, 200 mm and 200 mm respectively from that of the third crank and their reciprocating masses are 50 kg, 60 kg and 50 kg respectively. Find the mass of the reciprocating parts for the third cylinder and relative angular position of the cranks in order that the engine may be in complete balance	L3 12M

OR

8	a)	What are in-line engines? How are they balanced? Is it possible to balance them completely?	L2 8M
	b)	Define Dalby's method of balancing masses	L1 4M

UNIT-V

9		An instrument vibrates with a frequency of 1Hz when there is no damping. When the damping is provided, the frequency of damped vibration was observed to be 0.9 Hz. Find. (i) damping factor (ii) logarithmic decrement.	L3 12M

OR

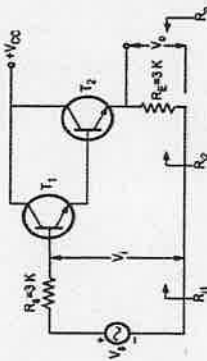|			
10	a)	The support of a spring mass system is vibrating with amplitude of 6 mm and a frequency of 1200 cycles/min. If a mass is 95 kg and the spring has a stiffness of 1950 N/m, determine the amplitude of vibration of the mass. If a damping factor of 0.2 is include, what would be the amplitude?	L3 8M
	b)	Discuss briefly with neat sketches the longitudinal, transverse and torsional free vibrations.	L2 4M

UNIT-III

5	a)	Explain the principle of working of an oscillator with suitable diagram according.	L2 6M
	b)	Design an RC phase shift oscillator to generate 5 KHz sine wave with 20 V peak to peak amplitude. Draw the designed circuit. Assume h_{fe} = 150.	L3 6M

OR

6	a)	Explain in detail the concept of stability in Oscillators.	L2 6M
	b)	In a transistorized Hartley oscillator, the two inductances are 2 mH and 20 µH while the frequency is to be changed from 950 KHz to 2050 KHz. Calculate the range over which the capacitor is to be varied.	L3 6M

UNIT-IV

7	a)	Discuss about Transformer coupled Class A Power Amplifier with diagram and determine its Maximum efficiency.	L2 6M
	b)	A Class B push pull amplifier drives a load of 16Ω, connected to the secondary of ideal transformer. The V_{cc} is 25V. If number of turns on primary is 200 and secondary is 50. Determine maximum power output, DC power input and efficiency.	L3 6M

OR

8	a)	Discuss about Transformer coupled Class A Power Amplifier with diagram and determine its Maximum efficiency.	L2 6M
	b)	Explain the effect of cascading single tuned amplifiers on bandwidth.	L2 6M

UNIT-V

9	a)	Obtain the expression for time period, T in Astable multivibrator.	L3 8M
	b)	Define a Multivibrator and mention its types.	L2 4M

OR

10	a)	List the applications of Astable and Monostable multivibrator.	L2 5M
	b)	Design and draw a saturated collector coupled monostable multivibrator for the following specifications: V_{CC} = 10 V, V_{BB} = -5 V, pulse duration = 12ms, $I_{C(ON)}$= 2 mA and two NPN transistors with minimum h_{fe} =100 and I_{CBO}=0.	L3 7M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations April-2023

ELECTRONIC CIRCUIT ANALYSIS

(ECE)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (5 x 12 = 60 Marks)
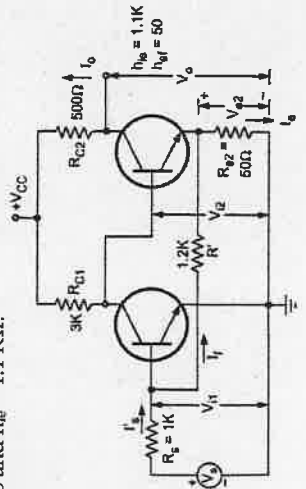
UNIT-I

1	a)	Deduce the expressions for the hybrid π parameters g_m, $g_{b'e}$, $g_{b'c}$, $r_{bb'}$ and g_{ce}.	L4 6M
	b)	At I_c = 1mA and V_{CE}=10V, a certain transistor data shows: $C_c = C_{b'c}$ = 3pF, h_{fe} = 200 and w_T = -500 M rad/sec. Calculate g_m, $r_{b'e}$, $C_e = C_{b'e}$ and w_β.	L3 6M

OR

2	a)	Construct the block diagram of n-stage cascade amplifier and analyze its various parameters.	L4 6M
	b)	For the circuit shown in Fig. Calculate R_i, A_i, A_V and R_o if the h – parameters are h_{ie}=1.1kΩ, h_{fe}=50, h_{oe}= 25µA/V and h_{re} = 2.5 x 10-4. Derive the necessary expressions.	L3 6M

UNIT-II

3	a)	Explain the effect of negative feedback on input resistance for Current shunt and Voltage shunt Feedback amplifier.	L2 6M
	b)	A voltage series negative feedback amplifier has a voltage gain without feedback of A = 500, input resistance R_i = 3kΩ, output resistance R_0 = 20kΩ and feedback ratio, β = 0.01. Calculate the voltage gain A_f, input resistance R_{if}, and output resistance R_{of} of the amplifier.	L3 6M

OR

4	a)	Explain the parameters in expressions of Gain, input and output resistances for a Voltage Series feedback amplifier.	L2 6M
	b)	Compute A_i and A_{if} using feedback principle for the circuit shown in figure. Assume h_{ie} = 50 and h_{ie} = 1.1 KΩ.	L3 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations April 2023
PHYTHON PROGRAMMING
(CSE)

Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1	a)	What are the features of Python programming?	L1	6M
	b)	Explain the variables and keywords in Python with examples?	L2	6M

OR

2	a)	Illustrate the Input and Output statements with example?	L2	6M
	b)	Write a Python program to find total and average marks based on input?	L4	6M

UNIT-II

3	a)	Discuss the Membership and Identity operators with examples?	L2	6M
	b)	Rate the order of execution of different Expressions by evaluating them through Python program?	L5	6M

OR

4	a)	Explain break, continue and pass statement with the help of for loop with an example?	L2	6M
	b)	Write a Python program to calculate sum of natural numbers?	L4	6M

UNIT-III

5	a)	Define function and explain the types of functions with an example?	L1	6M
	b)	Describe about default arguments with suitable program?	L2	6M

OR

6	a)	What is Polymorphism? How will you perform Method Overloading?	L1	6M
	b)	Demonstrate implementation of hierarchical inheritance in Python, with a program?	L2	6M

UNIT-IV

7	a)	Describe about Name spacing?	L2	6M
	b)	Explain the from import statement in modules?	L5	6M

OR

8	a)	Classify Errors and Exception Handling in Python programming?	L4	6M
	b)	Write a Python code using try-except-else-finally statement in Python?	L3	6M

UNIT-V

9	a)	Discuss about Maps in Python?	L2	6M
	b)	Create a Python Program to display the current date and time?	L6	6M

OR

10	a)	Illustrate Python Runtime Services and Data Compression?	L3	6M
	b)	Describe the Filters in Python?	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations April-2023
POWER ELECTRONICS
(EEE)

Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1 Briefly explain about Insulated Gatte Bipolar Transistor (IGBT) and it's   L2   12M
   switching characteristics.

OR

2 Explain the Resistance Capacitance firing circuit with the necessary   L2   12M
   waveforms.

UNIT-II

3 A single Phase fully controlled converter supplies an inductive load.   L3   12M
   Assuming load current is constant=10A.Determine the following quantities if
   supply voltage is 230V,50 Hz and α=40. Calculate the i) Average Output
   Voltage of converter, ii) Supply RMS Current, iii) Supply Fundamental RMS
   Current, iv) Fundamental Power factor, v) Supply Power Factor, vi) Supply
   harmonic factor.

OR

4 Explain the operation of single-phase half wave converter with RL-Load at   L2   12M
   α=30 with necessary wave forms. Also derive the output voltage, output
   current and RMS output voltages.

UNIT-III

5 a) For step down chopper dc source voltage is 230v, load resistance is 10 ohm.   L3   8M
       The chopper when it is in ON is 2V. For a duty cycle of 0.4. Calculate a)
       average and rms values of output voltage b) chopper efficiency.

   b) List some applications of dc chopper?   L1   4M

OR

6 A DC chopper is connect to a 100V DC source supplies an inductive load   L3   12M
   having 40 mh in series with a resistance of 5ohms. A freewheeling diode is
   placed across the load. The load current varies between the limits of 10A and
   12A. Determine the time ratio of the chopper.

UNIT-IV

7 a) Explain the principle of operation of single phase to single phase Bridge type   L2   12M
       step-down cycloconverter with Resistive Load

OR

8 Explain the principle of operation of single phase to single phase step- down   L4   12M
   Bridge type cycloconverter with Resistive Inductive Load for Discontinuous
   Load Current.

UNIT-V

9 a) What is meant by ac voltage controllers and what are the different types?   L1   6M
   b) List the applications of ac voltage controller.   L1   6M

OR

10 Draw and Explain the operation of TRIAC with R and RL load.   L4   12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations April-2023
MATERIALS SCIENCE
(ME)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1		Discuss about the Mechanical and Technological Properties of Engineering Materials?	L2	12M

OR

2		Describe the various imperfections in crystals and their effects on properties.	L2	12M

UNIT-II

3	a)	Define congruent-melting alloys, Estimate components for following systems (i) Au-Cu System, (ii) Ice –water system,(iii) Al_2O_3-Cr_2O_3	L6	6M
	b)	Evaluate cooling curve of binary eutectic system	L4	6M

OR

4	a)	Evaluate Lever rule with tie line.	L4	6M
	b)	What are the eutectoid and eutectic reactions in Cu-Ni & Al-Cu binary phase diagram?	L1	6M

UNIT-III

5	a)	What is steel? What are the classifications of the steels?	L1	6M
	b)	Explain the structure and properties of Spheroidal graphite cast iron?	L2	6M

OR

6		What are the notable properties of Copper and its alloys? And Draw copper-zinc equilibrium diagram explain it.	L1	12M

UNIT-IV

7		Name the various methods of heat treatment of steel. Briefly explain any one method.	L1	12M

OR

8	a)	Compare the purpose of using normalizing, Annealing and Hardening?	L2	6M
	b)	Explain about various Hardening process use for alloys?	L2	6M

UNIT-V

9	a)	What are the glasses? How are they manufactured?	L1	6M
	b)	Discuss about the Glass micro structure and properties.	L2	6M

OR

10		Explain formation of polymers. Distinguish between Thermoplastics, Thermosetting plastics and list out its applications.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations April-2023
DIGITAL COMMUNICATIONS
(Electronics & Communication Engineering)
Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1 a) With a neat block diagram explain PCM transmitter and receiver.   L2   8M
   b) What are the advantages & disadvantages of PCM?   L1   4M

OR

2 a) Explain the DM (delta modulation system) with suitable diagrams.   L2   8M
   b) Explain Slope overload Distortion & Granular Noise.   L2   4M

UNIT-II

3 a) Derive the expression for impulse response of a matched filter.   L3   6M
   b) Explain the rectangular pulse for a matched filter.   L2   6M

OR

4 a) Explain in detail about modified duo binary signaling scheme.   L2   6M
   b) Describe the baseband M-array PAM Transmission system.   L2   6M

UNIT-III

5 a) What is the orthogonal basis function?   L1   6M
   b) Explain the concept of orthogonality basis function.   L2   6M

OR

6 a) Sketch the signal constellation diagrams for N=M=2.   L3   6M
   b) Explain the geometrical representation of signals.   L2   6M

UNIT-IV

7 a) Describe the generation and detection of DPSK.   L2   6M
   b) A binary data stream 101101100 is to be transmitted using DPSK.   L4   6M
       Determine the encoded and decoded output.

OR

8 a) Compare all the digital modulation techniques.   L2   6M
   b) Derive the probability of error for a coherent QPSK system.   L3   6M

UNIT-V

9 a) What are the types of parity check codes explain with neat diagrams?   L1   6M
   b) Explain the concept of Parity check matrix for linear block codes.   L2   6M

OR

10 a) Explain the Convolutional Encoding and Decoding methods.   L2   6M
   b) Discuss in brief about sequential decoding of convolutional codes.   L2   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations April-2023
COMPUTER NETWORKS
(COMPUTER SCIENCE AND ENGINEERING)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1	a)	Define Network and describe any two network topologies (1M+5M)	L1	6M
	b)	Discuss about responsibilities of Physical layer	L4	6M

OR

2	a)	Describe about analog signals	L2	6M
	b)	Briefly explain about different unguided media	L2	6M

UNIT-II

3	a)	Discuss about services provided by Data link layer.	L4	6M
	b)	Explain Cyclic Redundancy check method used for error detection.	L2	6M

OR

4	a)	Write about Pure and slotted ALOHA protocol.	L2	6M
	b)	Describe FDMA protocol.	L4	6M

UNIT-III

5	a)	Explore static routing algorithm.	L2	6M
	b)	Explain quality of service in network.	L2	6M

OR

6	a)	Sketch and explain in detail about IPV4protocol.	L3	6M
	b)	Elaborate Internet control protocols.	L4	6M

UNIT-IV

7	a)	Describe elements in transport layer.	L1	6M
	b)	Discuss performance issues of transport layer.	L3	6M

OR

8	a)	Summarize congestion control in transport layer.	L6	6M
	b)	Describe TCP protocol.	L2	6M

UNIT-V

9	a)	Explore WWW in application layer.	L3	6M
	b)	Explain about dynamic web pages.	L2	6M

OR

10	a)	Summarize the cookies in detail	L6	6M
	b)	Discuss MIME protocol with diagram.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations April-2023
ELECTRICAL MACHINES-II
(EEE)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1 A 2000/200V transformer has a primary resistance and reactance of 2 ohm and 4 ohm   12M
respectively. The corresponding secondary values are 0.025 and 0.04 ohm. Determine (i)
Equivalent resistance and reactance primary referred to secondary. (ii)Total resistance
and reactance referred to secondary.(iii) Equivalent resistance and reactance secondary
referred to primary.(iii)Total resistance and reactance referred to secondary.

OR

2 A 40 KVA transformer has an iron loss of 450 W and full load copper loss of 850W. If the   12M
power factor of the load is 0.8 lagging. Calculate (i) full load efficiency (ii) the load at
which maximum efficiency occurs and (iii) the maximum efficiency.

UNIT-II

3 Explain auto transformer in detail with diagram   12M

OR

4 Two transformers A and B are connected parallel to a load of (2+j1.5) ohm. Their   12M
impedance in terms of secondary are ZA=(0.15+j0.5) ohm and ZB=(0.1+j0.6) ohm. Their
no load terminal voltages are EA=(207+j0)V an EB=(205+j0)V. find the power output
and PF of each transformer

UNIT-III

5 Describe the constructional details of squirrel cage and wound rotor induction machines   12M

OR

6 A 4 pole, 3-phase induction motor operates from a supply whose frequency is 50Hz.   12M
Calculate. i) The speed at which the magnetic field of the stator is rotating. ii) the speed
of the rotor when the slip is 0.04 iii) the frequency of the rotor currents when the slip is
0.03 iv) the frequency of the rotor currents at standstill. v) speed of the rotor when the
slip is unity .

UNIT-IV

7 Explain no Load and blocked rotor Tests of 3Ø induction machine   12M

OR

8 A 20hp (14,92KW) 400V 950RPM 3 PHASED 50HZ 6 pole cage motor with 400v applied   12M
takes 6 times full load current at standstill and develops 1.8 times full load running
torques. The full load current is 30A. (a) What voltage must be applied to produce full
load torque at starting (b) What current will this voltage produce? (c) If the voltage is
obtained by auto transformer what will be the line current. (d) If starting current is
limited to full load current by an auto transformer what will be the starting torque as a
percentage of full load torque

UNIT-V

9 Explain the double field revolving theory of 1Ø induction motor   12M

OR

10 Explain the construction and operating principle of split phase induction motor   12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations April-2023
MANUFACTURING PROCESSES
(Mechanical Engineering)

Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1	a)	Name the pattern allowances provided on the pattern for sand casting and state the reasons why they are provided.	L1	6M
	b)	What are the requirements of good moulding sand?	L1	6M

OR

2	a)	With neat sketch explain centrifugal casting process.	L2	6M
	b)	With neat sketch explain stir casting process.	L2	6M

UNIT-II

3	With a neat sketch explain the working of submerged arc welding along with its applications.	L2	12M

OR

4	a)	Differentiate between the welding, brazing and soldering processes	L4	6M
	b)	List out the essential steps in brazing operation	L1	6M

UNIT-III

5	a)	What is bulk deformation process?	L1	6M
	b)	List out the applications of hot rolling and cold rolling process.	L1	6M

OR

6	a)	Distinguish roll forging and rotary forging.	L4	6M
	b)	List out various advantages and disadvantages of forging process.	L2	6M

UNIT-IV

7	a)	Discuss about the advantages, disadvantages and applications of sheet metal processes.	L2	6M
	b)	Differentiate the formability and spinning process.	L4	6M

OR

8	List out the production processes of metallic powders?	L2	12M

UNIT-V

9	Explain the working principles and application of Injection Moulding	L2	12M

OR

10	Write short note: 1) Film blowing 2) Extrusion process.	L2	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations April-2023
LINEAR & DIGITAL IC APPLICATIONS
(ECE)

Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1	(a)	Draw and Explain about the Inverting Amplifier.	L2	6M
	(b)	Draw and Explain about the Non-Inverting Amplifier.	L2	6M

OR

2		Draw and analyze the expressions of the following.		
	(a)	Differentiator.	L4	6M
	(b)	Integrator.	L4	6M

UNIT-II

3	(a)	Explain the operation of Astable multivibrator using 555 timer and also derive the expression for frequency of oscillation.	L2	8M
	(b)	Draw the pin diagram of 555 timer.	L1	4M

OR

4	(a)	Draw the circuit of a 1st order low pass Butterworth filter and discuss its transfer functions.	L2	8M
	(b)	Compare the low pass and high pass filters.	L1	4M

UNIT-III

5	(a)	Draw and Explain about the block schematics of PLL.	L2	8M
	(b)	Define PLL and List the applications of PLL.	L3	4M

OR

6	(a)	Draw and explain the weighted resistor DAC.	L1	6M
	(b)	Explain about ladder type DAC.	L1	6M

UNIT-IV

7		Design the logic circuit and write VHDL program for the following function.$F(Y) = \Pi\ A, B, C, D\ (1, 4, 5, 7, 9, 11, 12, 13, 15)$.	L3	12M

OR

8		Explain in detail different modeling styles of VHDL with suitable examples.	L2	12M

UNIT-V

9	(a)	With the help of logic diagram explain 74×157 multiplexer.	L2	6M
	(b)	Write a VHDL code for the above IC in data flow style.	L2	6M

OR

10	(a)	Distinguish between the synchronous and asynchronous counters.	L4	6M
	(b)	Design an 8-bit serial in and parallel out shift register.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations April-2023
FORMAL LANGUAGES AND AUTOMATA THEORY
(Computer Science and Engineering)

Time: 3 Hours   Max. Marks: 60

Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1	a)	Compare the NFA and DFA	L1	6M
	b)	Design a FA that reads strings made up of letters in the word CHARIOT and recognizes those strings that contain the word 'CAT' as a substring.	L3	6M

OR

2	a)	Design a FA that accepts even & odd numbers of a's and b's over an alphabet $\sum = \{a, b\}$	L2	6M
	b)	Define finite automata? Explain the block diagram of Automata.	L1	6M

UNIT-II

3	a)	Illustrate and prove the pumping lemma and also find whether $L = \{a^n b^n\}$ is regular or not.	L3	6M
	b)	Construct a DFA from the given regular expression $10+(0+11)0^*1$	L2	6M

OR

4	a)	Explain Regular Expression and Regular Sets with examples.	L2	6M
	b)	List applications of Regular Expressions.	L4	6M

UNIT-III

5	a)	Convert the following CFG to CNF. A→ ASA, A→a, S→ BSB, B→b ?	L4	6M
	b)	What is meant by CFG? Explain LMD and RMD With Examples.	L5	6M

OR

6	a)	What is the difference between FA, PDA and TM?	L5	6M
	b)	Explain the following terms with an example: i) Ambiguous Grammar. ii) Left Recursion. iii) CNF.	L4	6M

UNIT-IV

7	a)	Design PDA for $L = \{wcw^r \mid w \ ?(0+1)^*\}$	L4	6M
	b)	Design PDA for the language $L = \{a^n b^{n+m} c^m \mid n,m >= 1\}$	L6	6M

OR

8	a)	Obtain the PDA for the given regular language: $L = \{wwr \mid w \text{ is in } (0+1)^*\}$.	L5	6M
	b)	What is the language generated by the grammar $G=(V,T,P,S)$ where $P=\{S->aSb, S->ab\}$?	L6	6M

UNIT-V

9	a)	Construct the TM for $L = \{a^n b^n \mid n>=1\}$?	L5	6M
	b)	Enumerate about the Linear Bounded Automata?	L4	6M

OR

10	a)	Construct the TM for the 1's complement.	L6	6M
	b)	Define Turing Machine. And different types of TM?	L5	6M