SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Regular & Supplementary Examinations Feb/Mar- 2024
DIFFERENTIAL EQUATIONS AND COMPLEX ANALYSIS
(CE, EEE, MECH & ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	a)	Solve $(x+1)\dfrac{dy}{dx} - y = e^{3x}(x+1)^2$	L3	6M
	b)	Solve $\dfrac{dy}{dx} + y\tan x = y^2 \sec x$	L6	6M

OR

2.	a)	Solve $(D^2 - 4D + 3)y = 4e^{3x}$	L3	6M
	b)	Solve $(D^2 + 4D + 4)y = 4\cos x + 3\sin x$	L6	6M

UNIT-II

3.	a)	Solve $(D^2 + a^2)y = \tan(ax)$ by the method of variation of parameters	L6	6M
	b)	Solve $(x^2 D^2 - 2xD - 4)y = x^4$	L3	6M

OR

4.		An uncharged condenser of capacity is charged applying an e.m.f $E.\sin\dfrac{t}{\sqrt{LC}}$ through leads of self-inductance L and negligible resistance. Prove that at time 't' the charge on one of the plates is $\dfrac{EC}{2}\left[\sin\dfrac{t}{\sqrt{LC}} - \dfrac{t}{\sqrt{LC}}\cos\dfrac{t}{\sqrt{LC}}\right]$	L5	12M

UNIT-III

5.	a)	Form the partial differential equation by eliminating the arbitrary constants a & b from $2z = \dfrac{x^2}{a^2} + \dfrac{y^2}{b^2}$.	L3	6M
	b)	Form the partial differential equation by eliminating the arbitrary function from $z = f(x^2 - y^2)$.	L3	6M

OR

6.		Solve $4u_x + u_y = 3u$ and $u(0,y) = e^{-5y}$ by the method of separation of variables.	L3	12M

UNIT-IV

7.	a)	If $f(z) = u + iv$ is an analytic function and if $u + v = e^x(\cos y - \sin y)$, find $f(z)$ in terms of z.	L2	6M
	b)	Show that $f(z) = z + 2\bar{z}$ is not analytic anywhere in the complex plane.	L1	6M

OR

8.	a)	Find the image of the triangular region with vertices at (0,0),(1,0),(0,1) under the transformation $w = (1-i)z + 3$	L1	6M
	b)	Find the Bilinear transformation which maps the points (1, i, -1) into the points (2, i,-2)	L2	6M

UNIT-V

9.	a)	Evaluate $\displaystyle\int_c \dfrac{\sin^2 z}{\left(z - \dfrac{\pi}{6}\right)^3} dz$ where C is the circle $|z| = 1$	L2	6M
	b)	Expand f(z)=sin z as Taylor series about $z = \dfrac{\pi}{4}$	L2	6M

OR

10.		Show that $\displaystyle\int_0^{2\pi} \dfrac{d\theta}{a + b\cos\theta} = \dfrac{\pi}{\sqrt{a^2 - b^2}}$ where a>b>0	L2	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B. Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024

PROBABILITY & STATISTICS

(CSE, CSM, CAI & CAD)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. a) Two dice are thrown. Let A be the event that the sum of the point on the faces is 9. Let B be the event that at least one number is 6. Find (i)$P(A \cap B)$ (ii)$P(A \cup B)$ L3   6M

   b) Find the mean and variance of the uniform probability distribution given by $f(x) = \dfrac{1}{n}$ for $x = 1,2,...,n$.   L3   6M

OR

2. a) A random variable X has the following probability distribution

Values of x	0	1	2	3	4	5	6	7	8
P(x)	a	3a	5a	7a	9a	11a	13a	15a	17a

   (i) Determine the value of a

   (ii) Find $P(x<3)$, $P(x \geq 3)$ L3   6M

   b) Probability density function of a random variable X is $f(x)=\begin{cases}\frac{1}{2}\sin x, & for\ 0 \leq x \leq \pi \\ 0, & elsewhere\end{cases}$. Find the mean and also find the probability between 0 and $\pi/2$.   L3   6M

UNIT-II

3. In a sample of 1000 cases, the mean of certain test is 14 and standard deviation is 2.5.Assuming the distribution to be normal, find (i) How many students score between 12 and 15 (ii) How many students score above 18? (iii) How many students score below 8?   L3   12M

OR

4. a) If 3% of light bulbs are defective. Find (i) At least one is defective (ii) Exactly 6 are defective (iii) $P(1<x<7)$ in a sample of 100.   L3   6M

   b) Two dice are thrown five times. Find the probability of getting 7 as sum i) at least once (ii) $P(1<x<5)$ L3   6M

UNIT-III

5. Calculate correlation coefficient to the following data

X	11	16	13	17	13	18	24	14	22	20
Y	35	43	47	46	33	34	41	35	39	38

   L4   12M

OR

6. a) The first four moments of a distribution about the value 5 of the variables are 4, 25, 45 and 55.Calculate mean, variance, β_1 and β_2 of the distribution.   L4   6M

   b) Find the median to the following data :

Class intervals	40-50	50-60	60-70	70-80	80-90
frequency	10	17	28	12	8

   L3   6M

UNIT-IV

7. a) By the method of least squares fit a straight line to the following data ;

X	1	2	3	4	5
y	20	32	42	58	73

   L2   6M

   b) Fit a $y = ax^b$ to the following data, also calculate $y(2.5)$

X	1	2	4	6
Y	8	6	4	4

   L2   6M

OR

8. a) In a big city 225 men out of 500 men were found to be smokers. Does this information support the conclusion that the majority of men in this city are smokers?   L4   6M

   b) The means of two large samples of sizes 2000 and 3000 members are 65.5inches and 69.0 inches respectively. Can the samples be regarded as drawn from the same population of standard deviation 3.5 inches.   L2   6M

UNIT-V

9. A random sample of 10 boys had the following I.Q's : 90,130,120,102,99,93,85,98,106 and 100

   a) Do these data support the assumption of a population mean I.Q of 100?

   b) Find a reasonable range in which most of the mean I.Q values of samples of 10 boys lie.   L3   12M

OR

10. A pair of dice are thrown 350 times and the frequency of each sum is indicated below:

Sum	2	3	4	5	6	7	8	9	10	11	12
Frequency	6	22	33	35	42	62	50	41	24	20	15

   Would you say that the dice are fair on the basis of the chi-square test at 0.05 level of significant?   L5   12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
ENGINEERING CHEMISTRY
(CE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	a)	Define hardness. Distinguish between hard water and soft water?	L3	6M
	b)	How do you estimate dissolved oxygen in water by Winkler's method.	L4	6M

OR

2.		Explain with a neat sketch the various steps involved in Municipal Water Treatment.	L2	12M

UNIT-II

3.	a)	What is primary Battery? Write a note on Zinc-air battery	L1	6M
	b)	Explain the Construction and working of Lead acid battery	L2	6M

OR

4.	a)	What is a Fuel cell?	L1	2M
	b)	Describe the Construction and Working of Hydrogen– Oxygen Fuel Cell.	L3	10M

UNIT-III

5.	a)	What is functionality of monomer?	L1	6M
	b)	Write a note on nomenclature of polymers.	L1	6M

OR

6.	a)	Define refining of petroleum.	L3	2M
	b)	Describe the fractional distillation of petroleum.	L3	10M

UNIT-IV

7.	a)	Define composites?	L1	2M
	b)	Classify the composites materials	L1	10M

OR

8.	a)	What is cement? How do you classify the cement?	L1	6M
	b)	Explain in detail about setting and hardening of Portland cement?	L2	6M

UNIT-V

9.	a)	Write an account on carbon nanotubes.	L1	6M
	b)	Write a note on fullerenes.	L1	6M

OR

10.	a)	Write the applications of Nanomaterials?	L1	6M
	b)	Write the applications of Colloids.	L1	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
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)	Describe the formation of Newton's ring with necessary theory with relevant diagram and derive the expressions for dark and bright fringes.	L3	9M
	b)	In a Newton's rings experiment, the diameter of the 5th ring is 0.30 cm and the diameter of the 15th ring is 0.62 cm. Calculate the diameter of the 25th ring.	L4	3M

OR

2.	a)	In the study of Fraunhofer diffraction due to single slit how the diffraction fringes formed.	L4	8M
	b)	Obtain conditions for bright and dark fringes in single slit diffraction pattern and draw intensity distribution.	L4	4M

UNIT-II

3.	a)	Explain the formation of energy bands in solids.	L2	6M
	b)	Classify the solids into conductor, semiconductor & insulators based on band theory of solids.	L2	6M

OR

4.	a)	State and Explain Stoke's Theorem for curl.	L2	8M
	b)	If magnetic field $\vec{B} = x^2\hat{i} + 2y^2\hat{j} + 3z^2\hat{k}$ then find the curl of $\vec{B}$.	L3	4M

UNIT-III

5.	a)	Describe the construction and working principle of Nd:YAG laser with the help of a neat diagram.	L2	8M
	b)	Calculate the wavelength of emitted radiation from GaAs which has a band gap of 1.44 eV.	L4	4M

OR

6.	a)	Describe optical fiber communication system with block diagram.	L2	8M
	b)	Mention the application of optical fiber in sensors.	L1	4M

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.	L1	6M
	b)	Determine the energy band gap of the intrinsic semiconductor.	L3	6M

OR

8.	a)	Describe the construction and working mechanism of LED.	L2	8M
	b)	Determine the wavelength of LED fabricated by the CdS material with band gap of 2.42 eV.	L4	4M

UNIT-V

9.	a)	Explain DC and AC Josephson effects in superconductors.	L2	8M
	b)	What are the applications of superconductors?	L1	4M

OR

10.	a)	What are the techniques available for synthesizing nanomaterial's?	L1	4M
	b)	Explain Sol-Gel technique for synthesis of nanomaterial.	L2	8M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
ENGINEERING PHYSICS
(MECH)

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

UNIT-I

1.	a)	What is Interference and write their conditions.	L1	4M
	b)	Describe the formation of Newton's ring with necessary theory with relevant diagram and derive the expressions for dark and bright fringes.	L3	8M

OR

2.	a)	Define diffraction? Distinguish between Fraunhofer and Fresnel's diffraction.	L2	4M
	b)	In the study of Fraunhofer diffraction due to single slit how the diffraction fringes formed.	L4	8M

UNIT-II

3.	a)	Show that FCC is mostly closed packed structure than BCC and SC.	L2	8M
	b)	Write the important features of Miller indices.	L2	4M

OR

4.	a)	Explain the principle, procedure and advantage of Debye-Scherrer (Powder method) of X-ray diffraction.	L3	9M
	b)	State Bragg's law of X-ray diffraction.	L4	3M

UNIT-III

5.	a)	Define absorption coefficient of sound and derive it?	L3	4M
	b)	What are the basic requirements of acoustically good hall?	L2	8M

OR

6.	a)	Write the properties of Ultrasonic waves.	L3	6M
	b)	Give the important applications of ultrasonic waves?	L3	6M

UNIT-IV

7.	a)	Define the following i) Elasticity ii) isotropic materials iii) rigid body iv) Plasticity v) Hooke's law	L1	5M
	b)	What is stress? Explain different types of stresses.	L4	7M

OR

8.	a)	Classify different types of beams.	L2	8M
	b)	Define Young's modulus and rigidity modulus.	L1	4M

UNIT-V

9.	a)	Define Superconductivity? And Prove that super conductor is a very good diamagnetic material.	L5	6M
	b)	Write the properties of Superconductors.	L1	6M

OR

10.	a)	Explain ball milling technique for synthesis of nanomaterials?	L1	6M
	b)	What are the applications of nanomaterials in different fields.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
APPLIED CHEMISTRY
(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)	a) What is Electrochemical cell ? Give an example.	L1	6M
	b)	Calculate the single electrode potential of zinc in 0.05M $ZnSO_4$ solution at 25^0C. $E^0_{Zn/Zn^{2+}} = 0.763V$.	L3	6M

OR

2.		What is a Fuel cell? Describe the Construction and Working of Hydrogen – Oxygen Fuel cell.	L3	12M

UNIT-II

3.	a)	Derive Schrodinger wave equation?	L1	6M
	b)	Explain the significance of the Ψ and Ψ^2.	L3	6M

OR

4.	a)	Explain the energy level diagrams of CO molecule. Explain their magnetic nature and Bond order.	L3	6M
	b)	Explain the energy level diagrams of NO molecule. Explain their magnetic nature and Bond order.	L3	6M

UNIT-III

5.	a)	What is functionality of monomer?	L1	6M
	b)	Write a note on nomenclature of polymers.	L1	6M

OR

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

UNIT-IV

7.		What is meant by Chromatography? Define the main parts of an High Performance Liquid Chromatography (HPLC).	L3	12M

OR

8.	a)	Write a short note on Beer-Lambert's Law.	L1	5M
	b)	Write a note on atomic absorption and molecular absorption.	L1	7M

UNIT-V

9.	a)	What is basic lock and key principle ?	L1	6M
	b)	Write a short note on Complementarity.	L1	6M

OR

10.	a)	Write an account on Carbon Nano Tubes.	L1	6M
	b)	Write a note on Fullerenes.	L1	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
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)	*Half a Rupee Worth* by R K Narayan depicts Subbaiah's life. What is the lesson to be learnt in one's life?	L2	6M
	b)	What are the different strategies of reading?	L1	6M

OR

2	a)	How does creative thinking shape a person's career?	L2	6M
	b)	Construct a dialogue between Ram and Shyam on their recent visit to Bengaluru.	L3	6M

UNIT-II

3	a)	Motivation is the driving force behind a man's success. Discuss.	L1	6M
	b)	Human mindset plays a crucial force in overall growth. Explain the key factors involved in it?	L1	6M

OR

4		*The Thakur's Well* involves discrimination at many layers. Substantiate your argument with the concepts revolving around the story.	L2	12M

UNIT-III

5	a)	Rewrite the following sentences.	L1	8M

i)　The doctor said to Jim, "Take your medicines regularly."
ii)　The scientist said, "Ice freezes at 0°."
iii)　Chatterjee said, "I had missed the bus."
iv)　John said, "I will attend the conference."
v)　Padma said, "Sriram went to forest."
vi)　Madhavi said to Ravi," Why are you shouting?"
vii)　Raghav said, "I am a resident of Rayalaseema Region"
viii)　Rani said, "I am watching a serial."

	b)	Emotional intelligence changes one's perception. Illustrate with suitable examples.	L1	4M

OR

6	a)	*I am not that Woman* by Kishwar Naheed is all about women empowerment. Justify.	L2	6M
	b)	What are the different methods to gain peace of mind?	L1	6M

UNIT-IV

7	a)	How does different forms of information transfer improve learning?	L1	6M
	b)	Write a paragraph about your friend's daily routine.	L1	6M

OR

8	a)	"What is my name" by P. Sathyavathi is a plight of a woman faced in domestic situation. Elaborate.	L2	6M
	b)	What is Time Management and how does priorities shape a person's life?	L1	6M

UNIT-V

9	a)	*The Power of Prayer* changes the lives of individuals. How did Kalam's father guide Abdul Kalam?	L2	6M
	b)	Give an account on the reminiscences of Kalam's childhood at Rameswaram in the essay "The Power of Prayer"?	L2	6M

OR

10	a)	Correct the following sentences with suitable verb forms.	L1	6M

i)　　　Lalitha returned back from Agra.
ii)　　　Paresh eat pizza last week.
iii)　　　Tom is living in Goa since 2000.
iv)　　　Ilayaraja practice music every day.
v)　　　It rains yesterday.
vi)　　　They came late to the class, doesn't they?

	b)	Write an essay about your college.	L1	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb/Mar 2024
C PROGRAMMING AND DATA STRUCTURES
(EEE, ECE & MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

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

OR

2.	a)	Mention the different looping statements with syntax in C	L2	6M
	b)	Give the difference between while and do-while with c program to display 1 to 10.	L4	6M

UNIT-II

3.	a)	Define an Array. Write the syntax for declaring and initializing array with example.	L3	6M
	b)	Write a C program to display array of elements in given and reverse order.	L4	6M

OR

4.	a)	Define function. Explain the types of functions with an example.	L1	6M
	b)	Write a C program to swap two numbers using functions.	L4	6M

UNIT-III

5.	a)	Explain the concept of pointer to pointers with examples.	L2	6M
	b)	Distinguish between malloc(), calloc(), realloc() and free().	L4	6M

OR

6.	a)	Define structure and give the general syntax for structure. Write a suitable example program.	L1	6M
	b)	Explain about Enumerated data type.	L2	6M

UNIT-IV

7.		List the various operations that can be performed on stack? Explain with suitable example.	L2	12M

OR

8.	a)	What is a queue? What are various operations that can be performed on them? Explain with an example.	L2	6M
	b)	Differentiate between stack and queue	L3	6M

UNIT-V

9.		What do you mean by Searching? Explain sequential search and binary search with suitable example.	L3	12M

OR

10.		Order the following numbers using merge sort : 45,34,12,46,27,56,11,87,6,33,28	L5	12M

Q.P. Code: 20ME0301   R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
ENGINEERING GRAPHICS
(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. Construct an ellipse when the distance between the focus and directrix   L3   12M
    is 35 mm and eccentricity is ¾. Also draw the tangent and normal to
    any point on the curve.

OR

2. a) Construct a parabola with base 120 and length of the axis 60 by using   L2   6M
        Rectangle method.
    b) Construct a parabola in a parallelogram of sides 100 x 60 with an   L3   6M
        included angle of 75⁰.

UNIT-II

3. Draw the projections of the following points, keeping the distance   L2   12M
    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

OR

4. Draw the projections of a straight line AB of 70 mm long, in the   L2   12M
    following positions:
    a) Inclined at 30⁰ to VP, in HP and one end on VP
    b) Inclined at 45⁰ to HP, one end 20 mm above HP and parallel to and
    30 mm in front of VP
    c) Inclined at 60⁰ to VP, one end 20 mm in front of VP and parallel to
    and 25 mm above HP

UNIT-III

5. A regular hexagonal plane of 30 mm side has a corner on HP, and its   L3   12M
    surface is inclined at 45⁰ to HP. Draw the projections, when the
    diagonal through the corner, which is on HP makes 30⁰ with VP.

OR

6. A pentagonal prism of base side 30 mm and axis 60mm is resting on   L3   12M
    one of its rectangular faces on HP, with the axis parallel to VP. Draw
    its projections.

UNIT-IV

7. A hexagonal prism of side of base 30 mm and length of axis 75 mm is   L3   12M
    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.

Q.P. Code: 20ME0301   R20

OR

8. A cone of base 50 mm diameter and height 65 mm rests with its base on   L3   12M
    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.

UNIT-V

9. Draw three views of the blocks shown pictorially in figure according to   L4   12M
    first angle projection
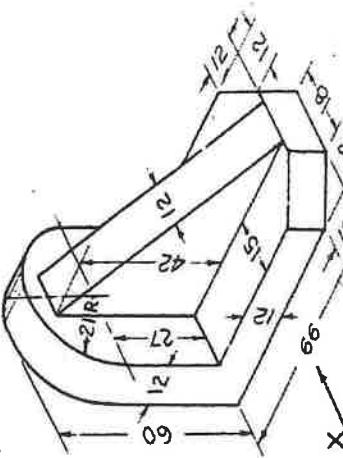
OR

10. Draw the isometric projection of a pentagonal prism of base side 35 mm   L3   12M
    and axis 60mm. The prism rests on its base on the HP with an edge of
    the base parallel to the VP.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
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B.Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
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) i) Define form factor.   L1 6M
      ii) Define peak factor.
      iii) Prove that the form factor of the sinusoidal wave is 1.11.
   b) Determine the current in branch A-B by using KVL   L3 6M

OR
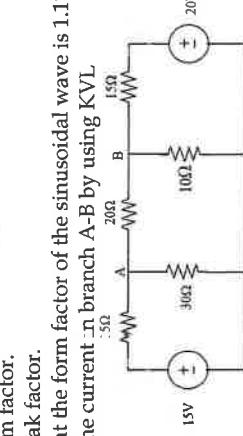
2. a) Distinguish between reactance, impedance, admittance and   L2 6M
      susceptance.
   b) Explain the phasor relation for R, L & C elements.   L2 6M

UNIT-II

3. a) Find load current by using Thevenin's theorem for the following circuit   L3 6M
      where $R_L = 3\ \Omega$
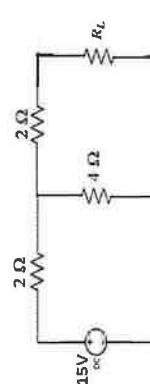
   b) State & explain Norton's theorem.   L2 6M

OR
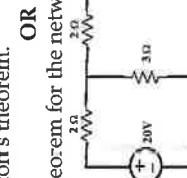
4. a) Verify reciprocity theorem for the network shown in below figure.   L3 8M

   b) State & explain Maximum Power transfer theorem.   L3 4M

UNIT-III

5. a) Explain about Parallel resonance with phasor diagrams.   L2 6M
   b) A series RLC circuit has R=10 Ω, L=0.1H and C=50 μF. The applied   L4 6M
      Voltage is 100V. Find Resonant frequency & Quality factor of a coil

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6. a) Determine the variation of impedance and phase angle of series   L4 6M
      resonant circuit with frequency.

   OR

   b) Find the value of C in the circuit shown to get resonance.   L4 6M

UNIT-IV
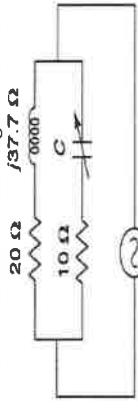
7. a) Explain series connection of coupled inductors.   L2 6M
   b) In the coupled circuit find the voltage across 5 ohm resistor.   L4 6M

OR
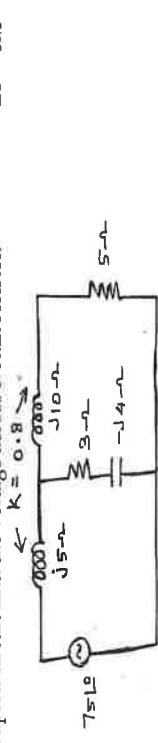
8. a) A 15mH coil is connected in series with another coil. The total   L4 6M
      inductance is 70mH. When one of the coils is reversed, the total
      inductance is 30mH. Find the self-inductance of second coil, mutual
      inductance and coefficient of coupling.

   b) What is dot convention? Why it is required?   L2 6M

UNIT-V

9. Find the tieset and cutset matrix for the given graph?   L4 12M

OR
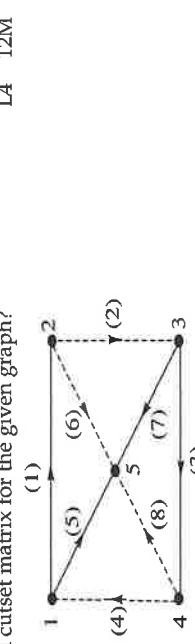
10. Write the procedure for constructing Tie set and Cut set matrices with   L4 12M
    example.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
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)	Analyse why Protocols and standards are important features of networks.	L4	6M
	b)	Describe the brief architectural history of a computer.	L1	6M

OR

2.	a)	Briefly explain the communication components of a computer system.	L2	6M
	b)	List the types of computers and write short notes on each computer.	L1	6M

UNIT-II

3.	a)	Discuss the importance of application architecture in IT system design.	L2	6M
	b)	Describe the advantages of client-server computing with some examples.	L2	6M

OR

4.	a)	Write short notes on cloud computing.	L2	4M
	b)	With the help of diagrams, explain how Google designed its IT system hardware architecture to achieve its mission.	L2	8M

UNIT-III

5.	a)	Calculate the value for the following addition: $(25A84)_{12} + (70396)_{12}$	L3	6M
	b)	Calculate the value for the following multiplication: $(2A6)_{12} \times (B1)_{12}$	L3	6M

OR

6.	a)	Convert the following numbers from their given base to decimal: (i) $(0.1001001)_2$ (ii) $(0.3A2)_{16}$ (iii) $(0.2A1)_{12}$	L2	6M
	b)	Convert the following hexadecimal numbers to binary: (i) $(4F6A)_{16}$ (ii) $(9902)_{16}$ (iii) $(A3AB)_{16}$	L2	6M

UNIT-IV

7.	a)	Summarize various types of common data that is represented in a Computer.	L2	6M
	b)	Briefly explain the three standards that are used in common for alphanumeric characters.	L2	6M

OR

8.	a)	Define page description language and list various page description languages.	L1	4M
	b)	List the five simple data types that are provided in most high-level programming languages and write a short note on each data type.	L1	6M

UNIT-V

9.	a)	Describe the unsigned binary and binary coded decimal representations with an example.	L2	4M
	b)	Convert the decimal numbers, 24 and 37 into BCD and also calculate the sum of the two BCD numbers obtained.	L2	4M
	c)	Calculate the value of largest unsigned integer that can be stored as a 16-bit number.	L3	4M

OR

10.	a)	Determine the result of multiplying two floating point numbers, normalize and round the result to 3-digit. i) 05220000 ×04712500. ii) 625.2035 x 25.7585. iii) 7024.775E2 x512.225E0.	L3	8M
	b)	Illustrate the structure of Typical 32-bit & 64-bit Floating Point Format.	L2	4M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
BASIC THERMODYNAMICS
(MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	a)	State system and difference between a closed system and an open system.	L1	6M
	b)	Explain Zeroth law of thermodynamics.	L3	6M

OR

2.	a)	Define thermodynamic State, Process, path and Cycle Give an example.	L2	6M
	b)	What do you mean by Path function and Justify the wok is a path function.	L2	6M

UNIT-II

3.	a)	What are the limitations of the First law of Thermodynamics?	L2	6M
	b)	In an internal combustion engine, during the compression stroke the heat rejected to the cooling water is 50kJ/kg and the work input is 100kJ/kg. Calculate the change in internal energy of the working fluid stating whether it is a gain or loss	L3	6M

OR

4.		Derive the reversible adiabatic process law PV^r = c.	L4	12M

UNIT-III

5.	a)	State and Explain Dalton law of partial pressure.	L2	6M
	b)	90 kJ of heat are supplied to a system at a constant volume. The system rejects 95 kJ of heat at constant pressure and 18 kJ of work is done on it. The system is brought to original state by adiabatic process. Determine (i) The adiabatic work; (ii) The values of internal energy at all end states if initial value is 105 kJ.	L3	6M

OR

6.		A mass of 0.25kg of an ideal gas has a pressure of 300 kPa, a temperature of 800C and a volume of 0.07 m3. The gas undergoes an irreversible adiabatic process to a final pressure of 300 kPa and final volume of 0.12m3, during which the work done on the gas is 25 kJ. Evaluate the Cp and Cv of the gas and the increase in entropy of the gas.	L3	12M

UNIT-IV

7.	a)	Develop the expression for air standard efficiency for diesel engine	L6	6M
	b)	The stroke and cylinder diameter of a compression ignition engine are 250mm and 150mm respectively. If the clearance volume is 0.0004m3 and fuel injection take place at constant pressure for 5% of the stroke. Determine the efficiency of the engine. Assume the engine working on the diesel cycle.	L3	6M

OR

8.	a)	Derive the expression for Carnot cycle efficiency.	L4	6M
	b)	Show the enthalpy, entropy and volume of steam at 1.4 MPa.	L2	6M

UNIT-V

|				
9.	a)	Describe Simple steam power cycle with neat sketches.	L3	6M
	b)	List the advantages and disadvantages of Regenerative cycle over Simple Rankine cycle	L3	6M

OR

10.		A steam power plant operates on a theoretical reheat cycle. Steam from boiler at 150 bar, 550°C expands through the high pressure turbine. It is reheated at a constant pressure of 40 bar to 550°C and expands through the low pressure turbine to a condenser at 0.1 bar. Draw T-s and h-s diagrams. Find :	L6	12M

(i) Quality of steam at turbine exhaust ;
(ii) Cycle efficiency ;
(iii) Steam rate in kg/kWh.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
ENGINEERING MECHANICS
(CE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. Four forces of magnitude 10 kN , 15 kN, 20 kN and 40 kN are acting at a point O as shown in Figure. The angles made by 10 kN, 15 kN, 20 kN and 40 kN with X-axis are 30°, 60°, 90° and 120° respectively. Find the magnitude, direction and inclination of the resultant force. **L3 12M**
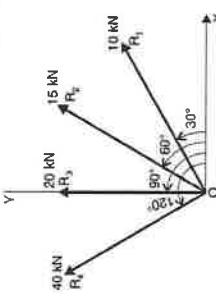
OR

2. a) Classify different system of forces with suitable examples. **L3 6M**
   b) The resultant of two forces when they act at right angles is 10N, whereas when they act at an angle of 60° the resultants is √148. Determine the magnitude of the two forces. **L2 6M**

UNIT-II

3. A truss of span 5m is loaded as shown in Figure. Find the reactions and forces in the members of the truss. **L3 12M**
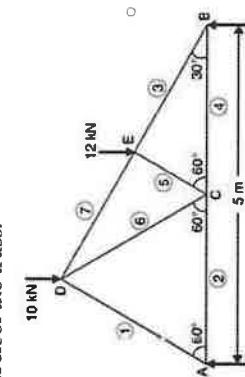
OR

4. Two blocks W_1 and W_2 resting on two inclined planes are connected by a horizontal bar AB as shown in Figure. If W_1 is equals 1000 N, determine the maximum value of W_2 for which the equilibrium can exists. The angle of limiting friction is 20° at all rubbing faces. **L2 12M**
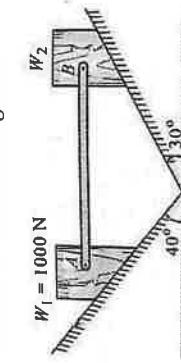
UNIT-III

5. Determine the co-ordinate of centroid 'C' for the section shown in figure. **L5 12M**

OR
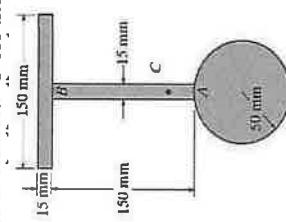
6. An I-section is made up of three rectangles as shown in Figure . Find the MOI of the section about the horizontal axis passing through the C.G of the section. **L5 12M**
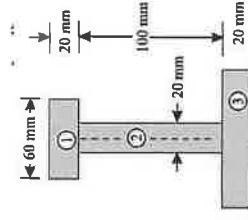
UNIT-IV

7. At a point within a body subjected to two mutually perpendicular directions, the stresses are 100 MPa (tensile) and 75 MPa (tensile). Each of the above stresses is accompanied by a shear stress of 75 MPa. Determine the normal, shear and resultant stresses on an oblique plane inclined at an angle of 45° with the axis of minor tensile stress. **L4 12M**

OR

8. A steel rod 5cm diameter and 6m long is connected to two grips and the rod is maintained at a temperature of 100°C. Determine the stress and pull exerted when the temperature falls to 20°C if (i) the ends do not yield, and (ii) the ends yield by 0.15cm. **L2 12M**

UNIT-V

9. Derive an expression for determining the circumferential stress (or hoop stress) and longitudinal stress for thin cylinder. **L3 12M**

OR

10. A pipe of 200mm internal diameter and 50mm thickness carries a fluid at a pressure of 10MN/m². Calculate the maximum and minimum intensities of circumferential stresses across the section. Also sketch the radial stress (pressure) distribution and circumferential stress distribution across the section. **L3 12M**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
ELECTRONIC 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) Describe the construction of PN Junction Diode. — L1 — 3M
   b) Define the terms:
      (i) Doping, (ii) Depletion region, (iii) Barrier Potential — L1 — 3M
   c) Analyze the current components of a PN Junction Diode and derive the diode current equation. — L4 — 6M

OR

2. a) Discuss about the forward and reverse resistances of a PN junction diode. — L2 — 6M
   b) A PN junction germanium diode has a reverse saturation current of 10 µA at the room temperature of 270C. It is observed to be 30µA, when the room temperature is increased. Calculate the new room temperature. — L3 — 6M

UNIT-II

3. a) Draw the circuit diagram of a Full Wave Rectifier and with the help of waveforms describe its operation. — L1 — 6M
   b) Draw the circuit symbol of UJT and its characteristics with neat diagram and list its applications. — L1 — 6M

OR

4. a) Derive the expressions for Average DC current, RMS Value of Current, DC Power Output and AC Power input for a Full Wave Rectifier. List the advantages. — L3 — 6M
   b) Draw the circuit symbol of Tunnel diode. Explain the Volt-Ampere (V-I) characteristics with the help of energy band diagrams and List its applications. — L2 — 6M

UNIT-III

5. a) Explain the operation of NPN transistor. — L2 — 6M
   b) List the differences between Depletion and Enhancement MOSFETs. — L2 — 6M

OR

6. a) Evaluate the relation between α and β of a Transistor. — L3 — 5M
   b) With a neat diagram, explain how a transistor acts as an amplifier. — L1 — 7M

UNIT-IV

7. a) Explain Collector to Base bias of a Transistor with neat circuit diagram and determine Q-point. — L2 — 6M
   b) Estimate the stability factors S, S' and S'' of a BJT Voltage Divider bias. — L3 — 6M

OR
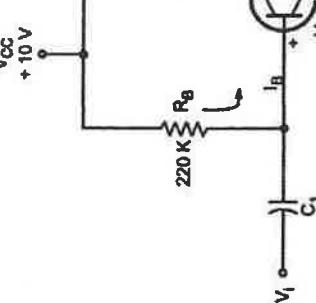
8. a) For the circuit shown in the Figure, solve IB, IC, VCE, VB, VC and VBC. Assume that VBE = 0 and β = 50. — L3 — 6M

   b) Define and Explain Thermal Runaway and Thermal Resistance. — L2 — 6M

UNIT-V

9. a) What is a small signal low frequency transistor amplifier? — L1 — 2M
   b) Define h-parameters and draw the generalized h-parameter model of a Transistor. Why hybrid model is used for the analysis of BJT amplifier at low frequencies? — L2 — 4M
   c) Draw the hybrid model for a transistor in CE configuration and derive its hybrid parameters. — L2 — 6M

OR

10. a) Derive expressions for Ai, Ri, Av and R0 for a Common Collector Amplifier using simplified hybrid model. — L3 — 6M
    b) Examine the expressions for current gain, voltage gain, input impedance and output impedance of CB amplifier using simplified hybrid model. — L2 — 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
ELECTRICAL TECHNOLOGY
(ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.		Explain the basic principle of operation of a DC Generator with a simple loop Generator	L2	12M

OR

2.	a)	Describe the different types of generator.	L4	6M
	b)	A 4-pole, long shunt, lap wound generator supplies 25kw at a terminal voltage of 500 V. The armature resistance is 0.03Ohms, series field resistance is 0.04Ohms and shunt field resistance is 200Ohms. The brush drop may be taken as 1 V. Determine the EMF generated.	L5	6M

UNIT-II

3.	a)	Explain the working principle of D.C motor with a neat sketch.	L2	6M
	b)	State the voltage and power equation of D.C motor explaining each term.	L3	6M

OR

4.	a)	What is Back E.M.F? And derive the equation for back emf	L2	6M
	b)	A 250 V motor has an armature circuit resistance of 0.5 ohms. If the full load armature current is 25A. Find the back EMF induced in the armature.	L2	6M

UNIT-III

5.	a)	Explain the Working principle of single –phase transformer.	L2	6M
	b)	A 230/110V, 1 KVA, single –phase transformer is connected to 230V, A.C Supply. Calculate (i) Primary current (ii) Secondary current.	L4	6M

OR

6.	a)	Write the short notes on Voltage Regulation & Efficiency.	L5	6M
	b)	A 10KVA, 2200/400 transformer has R1 = 5Ω, X1 = 12Ω, R2 = 0.2Ω, X2 = 0.48Ω. Determine the equivalent impedance of the transformer referred to i) Primary ii)Secondary.	L4	6M

UNIT-IV

7.	a)	Define the following (i)Slip, (ii)Slip speed	L2	6M
	b)	Derive rotor frequency and rotor induced emf of a 3-phase induction motor.	L4	6M

OR

8.	a)	List the differences between squirrel cage and wound rotor.	L1	6M
	b)	A 12 pole 3-φ alternator is coupled to an engine running at 1500r.p.m. If supplied a 3φ induction motor having full speed of 1440r.p.m. Find the %age slip, frequency of rotor current and no of poles of rotor.	L3	6M

UNIT-V

9.		Derive an EMF equation of an alternator.	L4	12M

OR

|				
10.		A 3-phase, 50 Hz, star connected 2000 KVA, 2300V alternator has an effective 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 whenthe power factor is 0.6 leading.	L2	12M

Q.P. Code: 20CE0163   R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
BASICS OF ENGINEERING MECHANICS
(MECH)
Time: 3 Hours   Max. Marks: 60
Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1. a) State and prove parallelogram law of forces.   L2   7M
    b) A weight of 800N is supported by two chains as shown in Figure.   L3   5M
   Determine the tension in each chain using Lami's theorem.

OR
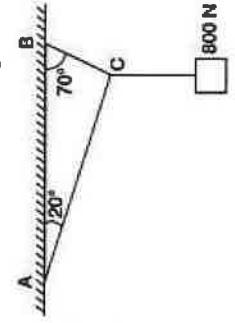
2. a) State and prove Varignon's theorem.   L2   8M
    b) Two unlike parallel forces of magnitude 400 N and 100 N are acting   L3   4M
       in such a way that their lines of action are 150 mm apart as shown in
       the Figure. Determine the magnitude of the resultant force and the
       point at which it acts.

UNIT-II
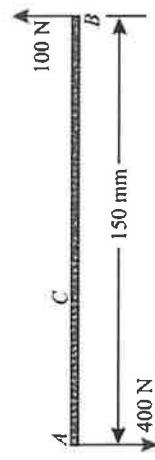
3. A king post truss of 8m span is loaded as shown in Figure. Find the   L4   12M
    forces in each member of the truss and tabulate the results.

OR
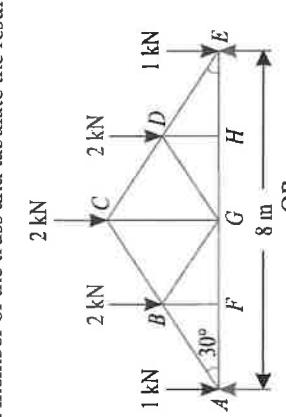
4. A ladder 5m long rests on a horizontal ground and leans against a   L4   12M
    smooth vertical wall at an angle 70° with the horizontal. The weight of
    the ladder is 900N and acts at its middle. The ladder is at the point of
    sliding, when a man weighing 750N stands on a rung 1.5m from the
    bottom of the ladder. Calculate the coefficient of friction between
    the ladder and the floor.

UNIT-III

5. a) Define parallel axis theorem.   L2   2M
    b) How will you find the moment of inertia of a triangle about its   L3   10M
       centroidal axis.

OR

6. Find the moment of inertia for the section shown in figure about its   L3   12M
    horizontal centroidal axis.
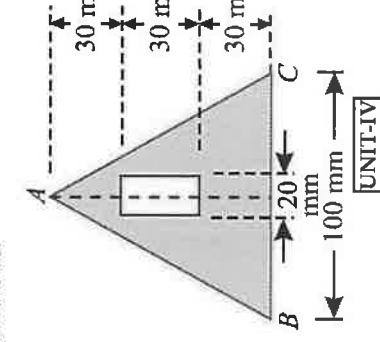
UNIT-IV

7. Define the following terminologies.   L2   12M
    (a) Stress & its types
    (b) Strain & its types
    (c) Modulus of elasticity & Modulus of rigidity
    (d) Poisson's ratio & Bulk modulus

OR

8. The tensile stresses at a point across two mutually perpendicular planes   L5   12M
    are 120 N/mm² and 60 N/mm². Determine the normal, tangential and
    resultant stresses on a plane inclined at 30° to the axis of minor stress
    using Mohr's circle.

UNIT-V

9. A 6 mm thick metal cylinder is filled with an incompressible fluid at   L3   12M
    a pressure of 3 N/mm². The cylinder has an internal diameter of 250
    mm and is 750 mm long. Find the additional volume of fluid pumped
    into the cylinder.

OR

10. Derive an expression for determining the circumferential stress (or   L4   12M
    hoop stress) and longitudinal stress for thin cylinder.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb/Mar- 2024
DIGITAL LOGIC DESIGN
(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) Perform the following using BCD arithmetic (i) $(79)_{10}$ + $(177)_{10}$ (ii) $(481)_{10}$ + $(178)_{10}$ L3   6M
   b) Subtraction by using 2's complement for the given i)111001-1010 ii) 10011-10001 iii)1001-101000.   L3   6M

OR

2. a) Subtract the given binary numbers 111001-1010 by using 1's and 2's complement method.   L3   6M
   b) Obtain the Dual of the following Boolean expressions.   L3   6M
   i.AB+A(B+C)+B' (B+D)
   ii. A+B+A'B'C
   iii. A'B+A'BC'+A'BCD+A'BC'D'E
   iv. ABEF+ABE'F'+A'B'EF

UNIT-II

3. a) Simplify using k-map to obtain a minimum POS expression (A'+B'+C+D)(A+B'+C+D)(A+B+C+D')(A+B+C'+D')(A'+B+C+D') (A+B+C'+D)   L3   6M
   b) Realize the above result using the NANAD gates.   L4   6M

OR

4. a) Simplify the Boolean function by using Map method F(A, B, C, D)=Σm (0, 1, 2, 5, 6, 7, 8, 9, 10, 14)   L3   6M
   b) Implement the following Boolean equation using only NAND and NOR gates Y=AB+CDE+F   L4   6M

UNIT-III

5. a) What is encoder? Design octal to binary encoder.   L2   6M
   b) Design a 16 line to 1 line multiplexer using 4 line to 1 line multiplexer.   L4   6M

OR

6. a) Draw and explain the operation of 3×2 binary multiplier   L3   6M
   b) Illustrate the following Boolean functions using decoder and OR gates. F1(A,B,C,D)=Σ(2,4,7,9) F2(A,B,C,D)= Σ(10,13,14,15)   L3   6M

UNIT-IV

7. What is a synchronous counter? Design a 3-bit synchronous up/down counter.   L3   12M

OR

8. Explain about the following counters in detail. i) Ring counter ii) Johnson counter.   L3   12M

UNIT-V

9. Illustrate the PAL for the following Boolean functions.   L3   12M
   (i) F(A,B,C,D) = Σm(2,3,8,9,,10,12,13)
   (ii) G(A,B,C,D) = Σm(1,3,4,6,9,12,14)

OR

10. Explain in brief about Programmable Read Only Memory (PROM) with a suitable example.   L3   12M

Q.P. Code: 20HS0833

R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
NUMERICAL METHODS, PROBABILITY & STATISTICS
(CE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.
a) Find the real root of the equation $3x = e^x$ using bisection method.   L3   6M
b) Compute $f(22)$ Using Newton's forward formula from the following table: L2   6M

x	20	25	30	35	40	45
$f(x)$	354	332	291	260	231	204

OR

2.
a) Find a real root of the equation $xe^x = 2$ using Regula-falsi method.   L3   6M
b) Estimate form following table $f(3.8)$ to three significant figures using Newton backward interpolation formula: L2   6M

x	0	1	2	3	4
$f(x)$	1	1.5	2.2	3.1	4.6

UNIT-II

3. Using R-K method of 4th order find $y(0.1)$ and $y(0.2)$ given that $\frac{dy}{dx} = x + y$, $y(0) = 1$.   L3   12M

OR

4.
a) Evaluate $\int_0^{\pi/2} \sin x \, dx$ using Trapezoidal rule, Simpson's 1/3 rule and compare with exact value.   L2   6M
b) Given that $\frac{dy}{dx} = y^2 + x$, $y(0) = 1$.Find $y(0.1)$ and $y(0.2)$ using the Euler's method.   L2   6M

UNIT-III

5.
a) Explain skewness and Kurtosis.   L1   6M
b) The following table shows the marks obtained by 100 candidates in an examination. Calculate the mean: L5   6M

Marks obtained	1 - 10	11 - 20	21 - 30	31 - 40	41 - 50	51 - 60
No. of candidates	3	16	26	31	16	8

OR

6.
a) Determine (i) $F\left(B/A\right)$ (ii) $P\left(A/B^c\right)$ if A and B are events with $P(A) = \frac{1}{3}$, $P(B) = \frac{1}{4}$ and $P(A \cup B) = \frac{1}{2}$.   L5   6M
b) 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.
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?   L2   6M

Q.P. Code: 20HS0833

R20

UNIT-IV

7.
a) Describe Discrete random variable.   L2   2M
b) A random variable X has the following probability distribution :   L3   10M

x	0	1	2	3	4	5	6	7
$P(x)$	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2 + k$

(i) Find k, (ii) Evaluate $P(X < 6)$, $P(X \geq 6)$, and $P\left(0 < X < 5\right)$,
(iii) If $P(X \leq c) > \frac{1}{2}$, find the minimum value of c, and (iv) Determine the distribution function of X.

OR

8.
a) Define Probability density function.   L2   2M
b) For the continuous probability function   L3   10M

$$f(x) = \begin{cases} k\, x^2 e^{-x}, & x \geq 0 \\ 0, & elsewhere \end{cases}$$

Find i) k ii) Mean   iii) Variance.

UNIT-V

9. Calculate the coefficient of correlation between X and Y for the following: L3   12M

X:	1	3	4	5	7	8	10
Y:	2	6	8	10	14	16	20

OR

10.
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.   L3   6M
b) In a sample of 1000 cases, the mean of certain test is 14 and standard deviation is 2.5.Assuming the distribution to be normal find (i) how many students score between 12 and 15, (ii) How many students score above 18? (iii) How many students score below 18?   L3   6M

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SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
DIGITAL ELECTRONICS
(EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. a) Perform Subtraction by using 1's complement for the given $(11010)_2 - (10000)_2$.   L3   6M

    b) Perform Subtraction by using 2's complement for the given $(1000100)_2-(1010100)_2$.   L3   6M

OR

2. What is Grey code? What are the rules to construct gray code? Develop the 4 bit gray code for the decimal 0 to 15.   L1   12M

UNIT-II

3. a) Simplify the following expression using the K-map for the 3-variable $Y = AB'C+A'BC+A'B'C'+A'B'C'+AB'C'$.   L3   6M

    b) Simplify the following Boolean expressions using K-map F(A, B, C, D)= Σm (1,3,7,11,15)+ Σd(0,2,5).   L3   6M

OR

4. Minimize the given Boolean function $F(A,B,C,D) = \Sigma m$ (0,2,3,6,7,8,10,12,13) using tabulation method.   12M

UNIT-III

5. Minimize the given Boolean function $F(A,B,C,D) = \Sigma m(0,2,3,6,7,8,10,12,13)$ using tabulation method.   L2   12M

OR

6. a) Design the 4-bit BCD adder using 4-bit binary adder   L1   6M

    b) Design the 2-bit by 2-bit binary multiplier and implement using gates   L1   6M

UNIT-IV

7. a) Write the differences between combinational and sequential circuits.   L2   5M

    b) Draw the logic diagram for D Flip Flop by using SR Flip Flop. Explain the operation with a truth table.   L1   7M

OR

8. Draw the JK flip-flop circuit using NAND gates and explain its operation.   L3   12M

UNIT-V

9. Given the 8-bit data word 01011011, generate the 13-bit composite word for the hamming code that corrects and detects single errors.   L1   12M

OR

10. What is RAM organization? Explain about Different types of RAM   L3   12M

Q.P. Code: 20EE0214 | R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
### CONTROL SYSTEMS
(ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. Write the differential equations governing the mechanical rotational systemshown in the figure and find transfer function.   L5   12M
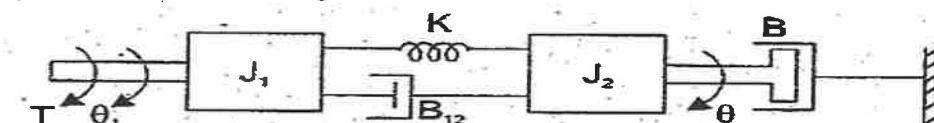
OR

2. Find the transfer function of Armature controlled DC Motor.   L3   12M

UNIT-II

3. For a unity feedback control system, the open loop transfer function.   L2   12M

$$G(S) = \frac{10(S+4)}{S^2(S+2)}$$

(i) Determine the position, velocity and acceleration error constants.

(ii) The steady state error when the input is $R(S) = \frac{2}{S} - \frac{2}{S^2} + \frac{1}{3S^2}$

OR

4. What is the significance of controller? Explain the effect of P, I, and D controllers with block diagrams.   L1   12M

UNIT-III

5. With the help of Routh's stability criterion determine the stability of the following systems represented by the characteristic equations: L2   12M

a) $s^5 + s^4 + 2 s^3 + 2 s^2 + 3s + 5 = 0$.

b) $9s^5 -20s^4 + 10 s^3 - s^2 - 9s - 10 = 0$.

OR

6. Develop the root locus of the system whose open loop transfer function is   L4   12M

$$G(s) = \frac{K}{S(S^2+4S+13)}$$

UNIT-IV

7. Develop the Bode plot for the following transfer function and determine thesystem phase and gain cross over frequencies   L4   12M

$$G(s) = \frac{10}{s(1 +0.5 S)(1+0.2S)}$$

OR

8. a) What is the Lead and Lag Compensators? 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. Derive the expression for the transfer function and poles of the system from the state model. $\dot{X} = Ax + Bu$ and $y = Cx + Du$.   L3   12M

OR

10. Determine the Solution for Homogeneous and Non homogeneous State equations.   L5   12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
DISCRETE MATHEMATICS
(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)	Show that the maximum number of edges in a simple graph with n vertices is $\frac{n(n-1)}{2}$.	L2	6M
	b)	Explain isomorphic graphs with a suitable example.	L2	6M

OR

2.	a)	Explain graph coloring and chromatic number with suitable examples.	L2	6M
	b)	Discuss the DFS algorithm.	L2	6M

UNIT-II

3.	a)	Explain the connectives and give their truth tables.	L2	6M
	b)	Show that $S \vee R$ is tautologically implied by $(P \vee Q) \wedge (P \rightarrow R) \wedge (Q \rightarrow S)$.	L3	6M

OR

4.	a)	Obtain the PDNF and PCNF of $P \rightarrow ((P \rightarrow Q) \wedge \sim (\sim Q \vee \sim P))$.	L3	6M
	b)	Use indirect method of proof to show that $(\forall x)(P(x) \vee Q(x)) \Rightarrow (\forall x)P(x) \vee (\exists x)Q(x)$.	L3	6M

UNIT-III

5.	a)	Define a binary relation. Let R be the relation from the set A = {1, 3, 4} on itself and defined by R = { (1, 1), (1, 3), (3, 3), (4, 4)} then Find the matrix of R , and draw the graph of R.	L2	6M
	b)	What is a compatibility relation? Explain the procedure to find the maximal compatibility blocks.	L2	6M

OR

6.	a)	Show that the binary operation * defined on $(R, *)$ where $x * y = x$ is not associative.	L2	6M
	b)	Show that the set of all roots of the equation $x^4 = 1$ forms a group under multiplication.	L3	6M

UNIT-IV

7.	a)	Enumerate the number of non-negative integral solutions to the inequality $x_1 + x_2 + x_3 + x_4 + x_5 \leq 19$.	L3	6M
	b)	Out of 5 men and 2 women, a committee of 3 is to be formed. In how many ways can it be formed if at least one woman is to be included?	L3	6M

OR

8.	a)	Explain Pigeon hole principle with an example.	L2	6M
	b)	Out of 80 students in a class, 60 play football, 53 play hockey and 35 play both the games. How many students (i) do not play of these games? (ii) Play only hockey but not football.	L3	6M

UNIT-V

9.	a)	Determine the sequence generated by $f(x) = 2e^x + 3x^2$.	L3	6M
	b)	Solve $a_n = a_{n-1} + 2a_{n-2}$, $n \geq 2$ with the initial conditions $a_0 = 0$, $a_1 = 1$.	L3	6M

OR

10.	a)	Solve $a_n = 2a_{n-1} - a_{n-2}$ with initial conditions $a_1 = 1.5$ and $a_2 = 3$.	L3	6M
	b)	Solve $a_n - 5a_{n-1} + 6a_{n-2} = 2$, $n \geq 2$ with the initial conditions $a_0 = 1$, $a_1 = 1$. Use generating functions.	L3	6M

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SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
ENTREPRENEURSHIP DEVELOPMENT
(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 is meant by Entrepreneurship? Define the Functions of an Entrepreneur. | L1 | 6M |
| | b) | Assess the Role of entrepreneurship in Economic development. | L5 | 6M |

OR

| 2. | a) | Briefly explain the elements of social Entrepreneurship. | L3 | 6M |
| | b) | Identify the problems faced by an Entrepreneur in India. | L2 | 6M |

UNIT-II

| 3. | a) | Briefly explain classification of MSMEs. | L3 | 6M |
| | b) | Construct the selecting Steps for Starting your own Enterprise. | L6 | 6M |

OR

| 4. | a) | Summarize about Licensing and Leasing and Franchising. | L3 | 6M |
| | b) | Elucidate the sole proprietorship, joint Hindu family and Joint Stock Company. | L3 | 6M |

UNIT-III

| 5. | a) | Examine the importance of Innovation in Entrepreneurship. | L4 | 6M |
| | b) | Outline the sources of new ideas generation for new product to improve your business. | L4 | 6M |

OR

| 6. | a) | Tell about the Techniques of generating new ideas of entrepreneurs. | L1 | 6M |
| | b) | What are the intellectual property rights and its importance? | L1 | 6M |

UNIT-IV

| 7. | a) | Relate the motivational factors influencing the entrepreneurs. | L3 | 6M |
| | b) | Entrepreneurship development program is the process of grooming entrepreneurs Comment. | L5 | 6M |

OR

| 8. | a) | What are the loans available for starting industrial venture in India | L1 | 6M |
| | b) | Role of government agencies in small business financing is crucial. Discuss. | L4 | 6M |

UNIT-V

| 9. | a) | Define Project Management. Determine the stages of Project Management process. | L2 | 6M |
| | b) | Explain the role of Project planning in Entrepreneurship. | L2 | 6M |

OR

| 10. | a) | Examine project life cycle in detail. | L2 | 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 Feb/Mar- 2024
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)	Describe the memory model of a typical memory chip.	L2	6M
	b)	Explain how memory addresses are assigned to a memory chip of size 1K(1024X8)	L2	6M

OR

2.		Draw a block diagram of Microprocessor based system and explain the functions of each component Microprocessor, Memory and I/O lines.	L2	12M

UNIT-II

3.	a)	Sketch neat the block diagram of 8085 architecture and explain the function of each block.	L3	6M
	b)	Discuss the different types of registers used in the 8085 microprocessor.	L2	6M

OR

4.	a)	List out the instruction sets, Explain the instruction sets with examples.	L2	6M
	b)	Explain the Data transfer instructions of the 8085 microprocessor with example.	L2	6M

UNIT-III

5.	a)	Analyze the functionality of I/O ports circuits in 8051 microcontroller.	L4	6M
	b)	List and explain the timers and counters operation in 8051 microcontrollers.	L2	6M

OR

6.	a)	Explain how the 8051 microcontroller transfers the serial data input and output using UART.	L2	6M
	b)	Explain the different types of interrupts in the 8051 microcontroller.	L2	6M

UNIT-IV

7.	a)	Explain the moving data instructions of 8051 microcontroller with an example.	L2	6M
	b)	Discuss the logical operations Instructions of 8051 microcontroller with an example.	L2	6M

OR

8.	a)	Write and explain an ALP program for performing OR, AND, XOR operation in 8051 microcontroller.	L2	6M
	b)	Explain Jump and Call instructions of 8051 microcontroller with an example.	L2	6M

UNIT-V

9.	a)	Design and explain the large matrix keyboard	L6	6M
	b)	Discuss about interrupt driven program for small keyboards	L2	6M

OR

10	a)	Design and explain the A/D converter circuit.	L6	6M
·	b)	Illustrate the seven-segment numeric led Display and explain the operation seven segments.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
ELECTRICAL POWER TRANSMISSION SYSTEMS
(EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. a) What is the necessity of transposition in transmission lines? L1 6M
   b) Derive the expression for the capacitance of a single-phase two-wire line. L3 6M

OR

2. 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

UNIT-II
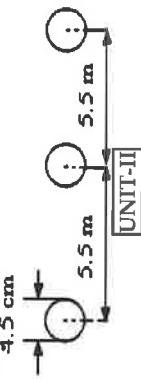
3. a) Write short notes on transmission lines' proximity effect and surge impedance loading. L5 6M
   b) Explain the transmission efficiency and % regulation in the transmission line. L2 6M

OR

4. a) Explain the different types of transmission lines. L2 6M
   b) Derive the sending voltage and % voltage regulation in short transmission lines with a neat phasor diagram. L3 6M

UNIT-III

5. a) Explain the potential distribution over a string of suspension insulator string. L2 6M
   b) A three-phase overhead line is suspended by a suspension type insulator, which consists of three units. The potential across the top unit and middle unit are 12kV and 18kV respectively. Calculate: (i) The ratio of capacitance between pin and earth to the self-capacitance of each unit (ii) Line voltage and (iii) string efficiency. L4 6M

OR

6. a) What are the advantages and disadvantages of corona? L2 6M
   b) A 3-phase, 220KV, 50Hz transmission line consisting of a 1.5 cm radius conductor spaced 2m apart in an equilateral triangular formation. If the temperature is 40Oc and atmospheric pressure is 76. 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 by two towers at heights of 40m and 90 m above water level. The horizontal distance between the towers is 400m. If the allowable tension is 2000kg, find the clearance between the conductor and water at a point mid-way between the towers' height of the conductor is 1kg/m. L4 6M

OR

8. a) Mention the applications of the sag template. L1 6M
   b) An overhead transmission line conductor having a parabolic configuration weighs 1.925 kg per meter of length. The area of the cross-section of the conductor is 2.2m cm2 and the ultimate strength is 8000 kg/cm2. The supports are 600 m apart having a 15m difference in levels. Calculate sag from the taller of the two supports which must be allowed so that the factor safety shall be 5. Assume. L4 6M

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. a) What are the limitations of belted cable? How these are can be overcome in pressurized cables? L1 6M
    b) A33KV single core cable has a conductor diameter of 10 mm and a sheath of the inside diameter of 40mm. find the maximum and minimum stress in the insulation. L3 6M

R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
THEORY OF MACHINES
(MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. a) Explain the effect of gyroscopic couple on an Aeroplane. — L1 — 6M
   b) An aircraft makes a half circle of 50 m radius towards left, when flying at 200 km/hr. The engine and the propeller of the plane have a mass of 400 kg and a radius of gyration of 0.3 m. The engine rotates at 2400 rpm clockwise when viewed from the rear. Find the gyroscopic couple and its effect on the aircraft. — L3 — 6M

OR

2. The turning moment diagram for a multi cylinder engine has been drawn to a scale 1 mm = 600 N-m vertically and 1 mm = 3° horizontally. The intercepted areas between the output torque curve and the mean resistance line, taken in order from one end, are as follows: + 52, – 124, + 92, – 140, + 85, – 72 and + 107 mm2, when the engine is running at a speed of 600 r.p.m. If the total fluctuation of speed is not to exceed ± 1.5% of the mean, find the necessary mass of the flywheel of radius 0.5 m. — L2 — 12M

UNIT-II

3. a) A conical friction clutch is used to transmit 90 kW at 1500 r.p.m. The semi cone angle is 20° and the coefficient of friction is 0.2. If the mean diameter of the bearing surface is 375 mm and the intensity of normal pressure is not to exceed 0.25 N/mm2, find the dimensions of the conical bearing surface and the axial load required. — L2 — 6M
   b) List various types of brakes. — L2 — 6M

OR

4. a) A torsion dynamometer is fitted to a propeller shaft of a marine engine. It is found that the shaft twists 2° in a length of 20 metres at 120 r.p.m. If the shaft is hollow with 400 mm external diameter and 300 mm internal diameter, find the power of the engine. Take modulus of rigidity for the shaft material as 80 GPa. — L3 — 6M
   b) Describe with sketches one form of torsion dynamometer and explain in detail the calculations involved in finding the power transmitted. — L2 — 6M

UNIT-III

5. In an engine governor of the Porter type, the upper and lower arms are 200 mm and 250 mm respectively and pivoted on the axis of rotation. The mass of the central load is 15 kg, the mass of each ball is 2 kg and friction of the sleeve together with the resistance of the operating gear is equal to a load of 25 N at the sleeve. If the limiting inclinations of the upper arms to the vertical are 30° and 40°, find, taking friction into account, range of speed of governor. — L2 — 12M

OR

6. A Proell governor has equal arms of length 300 mm. The upper and lower ends of the arms are pivoted on the axis of the governor. The extension arms of the lower links are each 80 mm long and parallel to the axis when the radii of rotation of the balls are 150 mm and 200 mm. The mass of each ball is 10 kg and the mass of the central load is 100 kg. Determine the range of speed of the governor. — L4 — 12M

R20

UNIT-IV

7. A shaft carries three masses A, B, and C of magnitude 150 kg, 200 kg, and 275 kg respectively and revolving at radii 70 mm, 60 mm and 80 mm in planes measured from A at 400 mm, and 800 mm. The angles between the cranks measured anticlockwise are A to B 125°, and B to C 250° The balancing masses are to be placed in planes X. The distance between the planes A and X is 500 mm. If the balancing masses revolve at a radius of 100 mm, find their magnitudes and angular positions. — L4 — 12M

OR

8. The following data refer to two cylinder locomotive with cranks at 90° : Reciprocating mass per cylinder = 300 kg ; Crank radius = 0.3 m ; Driving wheel diameter = 1.8 m ; Distance between cylinder centre lines = 0.65 m ; Distance between the driving wheel central planes = 1.55 m. Determine : 1. the fraction of the reciprocating masses to be balanced, if the hammer blow is not to exceed 46 kN at 96.5 km/hr.; 2. the variation in tractive effort ; and 3. the maximum swaying couple. — L4 — 12M

UNIT-V

9. Derive the natural frequency of Free Transverse Vibrations by
   (i) Rayleighs method.
   (ii) Dunkerleys method. — L3 — 12M

OR

10. A shaft of 100 mm diameter and 1 metre long has one of its ends fixed and the other end carries a disc of mass 500 kg at a radius of gyration of 450 mm. The modulus of rigidity for the shaft material is 80 GN/m2.Determine the frequency of torsional vibrations. — L2 — 12M

R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
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)	List the typical values of Hybrid –pi parameters.	L1	6M
	b)	Draw the Hybrid-pi model and explain the significance of each and every component in it.	L3	6M

OR

2.	a)	Define Cascading in amplifiers and explain the need for cascading.	L1	6M
	b)	Deduce the expressions for overall voltage gain, current gain, input and output resistances of a cascaded CC-CC amplifier with neat circuit diagrams.	L3	6M

UNIT-II

3.	a)	Analyze Emitter follower circuit with necessary diagrams for input and output resistances with feedback.	L4	6M
	b)	Compare various types of feedback amplifiers.	L4	6M

OR

4.	a)	Deduce the expressions of Gain, input and output resistances for a Voltage Series feedback amplifier.	L4	6M
	b)	An amplifier has voltage gain with feedback of 100. If the gain without feedback changes by 20% and the gain with feedback should not vary by more than 2%, determine the value of open-loop gain, A and feedback ratio, β.	L3	6M

UNIT-III

5.	a)	Explain the principle of working of an oscillator with suitable diagram and Classify the various types of oscillators.	L2	8M
	b)	Explain Barkhausen criterion.	L2	4M

OR

6.	a)	Determine the condition for sustained oscillations for an RC phase shift Oscillator with necessary circuit diagrams.	L3	6M
	b)	Determine the frequency of oscillations when a RC phase shift oscillator has R=10kΩ, C=0.01μF and RC = 2.2 KΩ. Also find the minimum current gain needed for this purpose.	L3	6M

UNIT-IV

7.	a)	Discuss about Transformer coupled Class A Power Amplifier with diagram and determine its Maximum efficiency.	L3	6M
	b)	Explain the working principle of Push Pull Class B Power Amplifier with neat diagram.	L3	6M

OR

8.	a)	Derive the expression for maximum efficiency of Push Pull Class B Power Amplifier with neat diagram.	L3	6M
	b)	Deduce the expressions for Quality factor, voltage gain and bandwidth of a single tuned capacitive coupled amplifier.	L4	6M

UNIT-V

9.	a)	Define multivibrator? List out the types of multivibrators.	L1	4M
	b)	Design and draw a saturated collector coupled monostable multivibrator for the following specifications: VCC = 10 V, VBB = -5 V, pulse duration = 12ms, IC(ON)= 2 mA and two NPN transistors with minimum hfe =100 and ICB_0=0.	L3	8M

OR

10.	a)	Derive the expression for the time period(T) of the Astable multivibrator.	L3	8M
	b)	Determine the value of capacitors to be used in an Astable multivibrator to provide a train pulse 2μs wide at a repetition rate of 100 kHz, if R1 =R2 =20kΩ..	L3	4M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
PYTHON PROGRAMMING
(CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	a)	Enumerate the various features and applications of Python?.	L1	6M
	b)	Discriminate about the Multi-Valued Data types with example.	L5	6M

OR

2.	a)	Define Variable and mention rules for choosing names of Variable with example.	L1	6M
	b)	Write a python program to find total and average marks based on Input.	L4	6M

UNIT-II

3.	a)	Rate the order of execution of different Expressions by evaluating them through python program.	L5	6M
	b)	Create a Python program to display Fibonacci series.	L6	6M

OR

4.		Examine the syntax of the following statements with example program. i) While loop ii) for loop	L4	12M

UNIT-III

5.	a)	Describe about default arguments with suitable program.	L2	6M
	b)	What is Polymorphism? How will you perform Method Overloading?	L1	6M

OR

6.	a)	Describe about class Constructor (_init_()) with example.	L2	6M
	b)	Analyze the term: Self-variable with code.	L4	6M

UNIT-IV

7.	a)	Express the term: user defined exceptions.	L1	6M
	b)	Explain about the import statement in modules.	L5	6M

OR

8.		What is package in Python? Explain the use of packages in your program with an example code.	L3	12M

UNIT-V

9.	a)	Explain the reading and writing files in python.	L2	6M
	b)	What is Data Management and Object Persistence? Explain in detail.	L1	6M

OR

10.	a)	Discuss about Maps in python.	L2	6M
	b)	Describe the Turtle using python program.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(CSM, CAD & CIA)

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

UNIT-I

1.	a)	Define data type? Discuss the data types available in java.	L1	6M
	b)	Develop a java program to read different data types using scanner.	L6	6M

OR

2.	a)	What is an array? Classify the types of arrays in java.	L1	6M
	b)	Create a java program to read and display the array elements.	L6	6M

UNIT-II

3.	a)	Define constructor? Classify the types of constructors in Java?	L1	6M
	b)	Write a java program to illustrate constructor overloading.	L6	6M

OR

4.	a)	Describe about the super keyword in java with example.	L2	6M
	b)	Distinguish method Overriding and method Overloading.	L5	6M

UNIT-III

5.	a)	Show about creating your own exception clauses.	L2	5M
	b)	Develop a java program to create own exception for negative value exception if the user enter negative value.	L6	7M

OR

6.	a)	Sketch and explain the Thread Life Cycle.	L4	6M
	b)	Write a Java Program to create two threads and execute Simultaneously	L2	6M

UNIT-IV

7.	a)	Define Generics. State the importance of Generics in java.	L1	4M
	b)	Demonstrate the implementation of Generics in java with an example program.	L3	8M

OR

8.	a)	Analyze the following concepts with java programs. a) Array list b) Tree set c) Linked hash map.	L4	6M
	b)	Apply the following interfaces with java programs. a) The collection interfaces. b) The set. c) The map entry.	L3	6M

UNIT-V

9.	a)	List out java Method references.	L2	2M
	b)	Explain java Method references with an example.	L2	10M

OR

10.		Discuss about swing controls with examples.	L2	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
GEOTECHNICAL ENGINEERING
(CE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1 a) Define the terms: (i) Liquidity index. (ii) Flow index. (iii) Toughness index.   (iv)   L1   6M
Activity.

   b) A soil sample has 80% of particles finer than 10 mm, 38% finer than 1.0mm, 12% finer   L3   6M
than 0.3 mm, 7.5% finer than 0.01 mm and 4% finer than 0.001 mm Draw grain size
distribution curve. Determine percent gravel, percent sand and percent fine fraction.
Classify the soil as per Indian Standard Classification System.

OR

2 a) Define: Liquid limit; Plastic limit; Shrinkage limit; and Plasticity index.   L2   6M

   b) Determine the average coefficient of permeability in the horizontal and vertical   L4   6M
direction for a deposit consisting of three layers of thickness 5m, 1m, and 2.5m and
having the coefficient of permeability of 3×10^{-2} mm/sec, 3×10^{-5} mm/sec and 4×10^{-2}
mm/sec respectively.

UNIT-II

3 a) What is consolidation? Describe the various types of consolidation of soils.   L2   6M

   b) A layer of soft clay is 6 m thick and lies under a newly constructed building. The   L4   6M
weight of sand overlying the clay layer produces a pressure of 2.6 kg/cm² and the
new construction increases the pressure by 1.0 kg/cm². If the compression index is 0.5.
Compute the settlement. Water content is 40% and specific gravity of grains is 2.65.

OR

4 a) Describe the Coefficient of compressibility and Compression Index by using e-p and e-   L1   6M
log p curves.

   b) In a consolidation test the following results have been obtained. When the load was   L4   6M
changed from 50 kN/m² to 100 kN/m², the void ratio changed from 0.70 to 0.65.
Determine compression index, coefficient of volume change and coefficient of
consolidation in mm²/sec.

UNIT-III

5 a) What are the assumptions and limitations made in Boussinesq's theory?   L1   6M

   b) A circular ring footing for an overhead water tank carries a load of 1000 kN whose   L4   6M
outer diameter is 3 m and inner diameter is 1.5 m. Determine the induced stress at a
depth of 3 m from surface below the centre of the loaded area.

OR

6 a) Explain vertical stress under line load, strip load, circular load and rectangular area   L1   6M

   b) Determine the vertical stress at a point P which is 3m below and at a radial distance of   L3   6M
3m from the vertical load 100kN. Use westergaard's solution.

UNIT-IV

7 a) Explain Taylor's stability number?   L2   6M

   b) A vertical cut is made is made in a clay deposit (c=30 kN/m², $\Phi' = 0°$, γ=16 kN/m²). Find   L3   6M
the maximum height which can be temporarily supported. Take S_n=0.261

OR

8 a) Explain factor of safety with respect to shear strength, cohesion and friction?   L2   6M

   b) Explain different types of slope failures with neat sketches   L1   6M

UNIT-V

9 a) How boring operations are carried out using rotary auger boring and drilling?   L2   6M

   b) Describe the construct of a split spoon sampler. Explain how undisturbed soilsample is   L2   6M
extracted using it.

OR

10 a) Explain the various salient features of a soil exploration report   L2   6M

   b) Describe the execution of soil exploration program.   L2   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
MATERIALS SCIENCE
(MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.		Derive an expression for number of atoms per unit cell and Atomic Packing Factor in case of Simple cubic, BCC, and FCC.	L3	12M

OR

2.	a)	Differentiate substitutional and interstitial solid solutions with examples.	L2	6M
	b)	Explain the Hume Rothery's rules for solid solutions.	L2	6M

UNIT-II

3.	a)	Construct binary phase diagram of Al-Cu and show eutectic point temperature and wt% of Cu.	L2	6M
	b)	Evaluate cooling curve of binary eutectic system.	L2	6M

OR

4.		From the data given below for Cu-Ni system, plot the equilibrium diagram to scale and label the diagram	L5	12M

Weight %Ni	0	20	40	60	80	100
Liquid Temp. $\dot{C}$	1084	1200	1275	1345	1440	1455
SolidTemp. $\dot{C}$	1084	1165	1235	1310	1380	1455

Answer the following for 70% Ni alloy
a) What is the composition of first solid crystallizing out from liquid?
b) What is the composition of last solid formed at the end of solidification? What are the amounts of solid and liquid at 1360 $\dot{C}$?

UNIT-III

5.	a)	Explain the structure and properties of Spheroidal graphite cast iron?	L2	8M
	b)	What are the properties and characteristics of stainless steel?	L2	4M

OR

6.	a)	Explain the structure and properties of Titanium and its alloys?	L2	6M
	b)	Draw copper-zinc equilibrium diagram explain it.	L4	6M

UNIT-IV

7.		Explain the various methods of heat treatment of steel.	L2	12M

OR

8.	a)	Explain about various Hardening process use for alloys?	L2	6M
	b)	Discuss about the gray cast iron, malleable cast iron and spheroidal graphite iron	L2	6M

UNIT-V

9.	a)	Explain the properties and applications of any four types of ceramics.	L2	6M
	b)	Discuss about the Glass micro structure and properties.	L2	6M

OR

10.	a)	Explain the role of different types of reinforcement in strengthening of matrix materials.	L2	8M
	b)	What are the applications of fiber reinforced composites?	L1	4M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
DIGITAL COMMUNICATIONS
(ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	a)	Explain fundamental limitations of Communication systems.	L2	6M
	b)	Explain the Process of Quantization with Example.	L2	6M

OR

2.	a)	Explain the Redundant information in PCM.	L2	6M
	b)	Consider an audio signal consisting of the sinusoidal term given as x (t) =3cos (500πt). (i) Determine the SNR noise ratio. When this is quantized using 10 its PCM. (ii) How many bits of quantization are needed to achieve a SNR ratio of at least 40dB.	L3	6M

UNIT-II

3.		Derive the expression for the Nyquist criterion for distortion less baseband Transmission in the absence of noise in terms of time domain & Frequency domain.	L3	12M

OR

4.	a)	What is ISI? Draw the basic block diagram of baseband binary data transmission.	L1	6M
	b)	Describe Eye pattern and construct the diagram.	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)	Discuss about signal constellation diagram.	L2	6M
	b)	Sketch the signal constellation diagrams for N=M=2.	L3	6M

UNIT-IV

7.	a)	Derive the expression for probability of error for BPSK.	L3	6M
	b)	Describe the generation and detection of BPSK.	L2	6M

OR

8.	a)	Sketch with a neat diagram of M-array PSK transmitter and receiver	L3	6M
	b)	Compare all the digital modulation techniques	L2	6M

UNIT-V

9.	a)	Describe the Error detection and correction codes.	L2	6M
	b)	What is forward error correction system and explain in detail?	L1	6M

OR

10.	a)	List all the code vectors.	L1	6M
	b)	Find out minimum distance & weight of the code.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
COMPUTER NETWORKS
(CSE, CSM, CAD & CIA)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.		Write about various Network Topologies.	L4	12M

OR

2.	a)	Discuss about responsibilities of physical layer in detail.	L2	6M
	b)	Write notes on i) Radio Wave ii) Micro wave.	L4	6M

UNIT-II

3.	a)	What is framing? Explain with frame architecture.	L2	6M
	b)	Justify what are the error correction techniques used in data link layer.	L5	6M

OR

4.	a)	Describe about checksum in data link layer.	L2	6M
	b)	Write about FDMA protocol.	L4	6M

UNIT-III

5.	a)	Calculate the Shortest Path Algorithm considering an example.	L3	6M
	b)	Explain distance vector routing algorithm.	L2	6M

OR

6.	a)	Explain about quality of service in network layer.	L2	6M
	b)	Sketch and explain in detail about IPV6protocol.	L3	6M

UNIT-IV

7.		Explain the TCP protocol with neat sketch.	L2	12M

8.	a)	Explain the three way handshake protocols with suitable diagram.	L2	6M
	b)	Identify the problems occur during connection establishment.	L3	6M

UNIT-V

9.	a)	Explain about dynamic webpages.	L2	6M
	b)	Illustrate in detail about function and structure of e-mail protocol.	L3	6M

OR

10.	a)	Write about TELNET.	L4	6M
	b)	Summarize in detail about cookies.	L6	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
MANUFACTURING PROCESSES
(MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	a)	List the main advantages and applications of the casting process	L1	6M
	b)	What are the major limitations of the sand casting process and how are they overcome?	L2	6M

OR

2.	a)	With neat sketch explain centrifugal casting process.	L1	6M
	b)	Distinguish hot die casting and cold die casting.	L2	6M

UNIT-II

3.	a)	Compare TIG and MIG welding processes.	L2	6M
	b)	Explain briefly how can be metals joined using adhesives.	L1	6M

OR

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

UNIT-III

5.	a)	Discuss the different types of rolling mills with a neat sketch.	L3	6M
	b)	Write the advantages and disadvantages of rolling processes.	L1	6M

OR

6.	a)	With neat sketch explain forward and backward extrusion process.	L1	6M
	b)	Differentiate the hot and cold extrusion processes.	L4	6M

UNIT-IV

7.	a)	Write the Formability of sheet metal characteristics.	L2	6M
	b)	List out the production processes of metallic powders?	L1	6M

OR

8.		What is Metal spinning? Explain with neat sketch.	L2	12M

UNIT-V

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

OR

10.	a)	What are the major considerations in the design of plastic parts?	L1	6M
	b)	Explain briefly about calendaring with neat sketch.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
LINEAR AND 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)	Define Integrated Circuit.	L1	2M
	b)	Draw the block diagram of Op-Amp and explain each block.	L3	10M

OR

2.	a)	Derive the output voltage for Inverting adder.	L3	6M
	b)	Derive the output voltage for non-Inverting adder.	L3	6M

UNIT-II

3.	a)	Define Filter.	L1	2M
	b)	Draw the circuit of a 1st order low pass Butterworth filter and discuss its transfer function.	L1	10M

OR

4.	a)	Draw the pin diagram of 555 timer	L2	2M
	b)	Explain the operation of Astable multivibrator using 555 timers and also derive the expression for frequency of oscillation.	L3	10M

UNIT-III

5.	a)	Define PLL.	L2	2M
	b)	Draw and Explain about the block schematics of PLL.	L2	10M

OR

6.	a)	Draw the circuit diagram of basic CMOS NOT gate and explain its operation.	L2	6M
	b)	Draw the circuit diagram of basic CMOS NOR gate and explain its operation.	L2	6M

UNIT-IV

7.	Explain about VHDL program structure with example.	L2	12M

OR

8.	Design the logic circuit and write VHDL program for the following function. $F(X) = \Sigma\ A, B, C, D\ (0, 2, 5, 7, 8, 10, 13, 15) + d\ (1, 6, 11)$.	L4	12M

UNIT-V

9.	a)	Design a 3 to8 decoder with 74×138 IC's.	L3	6M
	b)	Write a VHDL program for the above design.	L4	6M

OR

10.	a)	With the help of logic diagram explain 74×157 multiplexer.	L4	6M
	b)	Write a VHDL code for the above IC in data flow style.	L4	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
FORMAL LANGUAGES AND AUTOMATA THEORY
(CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. a) Construct Mealy machine corresponding to Moore machine?   L3   6M

States (Q)	Next States I/P=0	Next States I/P=1	Output
→q1	q1	q2	0
q2	q1	q3	0
q3	q1	q3	1

   b) Describe Finite Automata with Output.   L2   6M

OR

2. Write down procedure for minimizing automata using Myhill-Nerodetheorem with a given example. ('*' means final states)   L3   12M

Present State	Next State I/P=a	Next State I/P=b
A	B	F
B	A	F
C	G	A
D	H	B
E	A	G
*F	H	C
*G	A	D
*H	A	C

UNIT-II

3. a) List out the identities of Regular expression.   L1   6M
   b) From the identities of RE, prove that   L3   6M
   i) 10+(1010)*[^+(1010)*]=10+(1010)*
   ii) (1+100*)+(1+100*)(0+10*)(0+10*)*=10*(0+10*)*

OR

4. a) Construct an equivalent FA for the given regular expression (0+1)*(00+11)(0+1)*   L3   6M
   b) Prove R=Q+RP has unique solution, R=QP*   L3   6M

UNIT-III

5. a) Define Ambiguous grammar with examples.   L1   6M
   b) Remove Left recursion from the grammar   L3   6M
   S →Sab/T   T →Tcd/F   F →Fa/G

OR

6. a) State what is meant by derivation and parse tree with examples.   L1   4M
   b) Construct Leftmost and Rightmost derivation and derivation tree for the string 0100110.   L5   8M
   S → 0S/1AA
   A → 0/1A/0B
   B → 1/0BB

UNIT-IV

7. a) Describe Instantaneous description (ID) in PDA.   L2   6M
   b) Define push down automata? Explain acceptance of PDA with final state.   L3   6M

OR

8. Construct a PDA that recognizes balanced parentheses.   L5   12M

UNIT-V

9. a) Explain about the graphical notation of TM.   L3   6M
   b) Describe Instantaneous Description of Turing Machine.   L2   6M

OR

10. Design a Turing Machine to accept the set of all palindrome over {0,1}*.Draw the transition diagram for the same.   L5   12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb/Mar- 2024
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(CSM, CAD & CIA)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	"Managerial economics is the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management". Comment.	L3	12M

OR

2.	a)	What do you mean by demand forecasting?	L1	2M
	b)	Briefly explain about the factors governing Demand forecasting.	L2	10M

UNIT-II

3.	A firm has Fixed Cost of Rs 10000/-, selling price per unit is Rs.5/- and variable cost per unit isRs. 3/- (a) Determine Break Even Point in terms of Volume and also Sales Value. (b) Calculate the Margin of safety considering that the actual production is 8000 units.	L3	12M

OR

4.	a)	What is least-cost combination of inputs?	L1	6M
	b)	Evaluate the Cobb Douglas production function.	L4	6M

UNIT-III

5.	a)	Explain how the price is determined in case of perfect competition.	L2	6M
	b)	Explain different methods of pricing.	L2	6M

OR

6.	a)	Discuss various characteristics of market.	L2	6M
	b)	State the features of Imperfect competition.	L1	6M

UNIT-IV

7.	a)	What do you understand by time value of money?	L1	6M
	b)	How the time value of money is helpful in Capital Budgeting?	L1	6M

OR

8. Consider the case of the company with the following two investment alternatives each   L5   12M
costing Rs.9 lakhs. The details of cash inflows are as follows:

Year	Project1	Project2
1	3,00,000	6,00,000
2	5,00,000	4,00,000
3	6,00,000	3,00,000

Estimated the cost of capital is 10% per year. Determine NPV for the two projects.

UNIT-V

9.	a)	Write a short note on the following Liquidity ratio.	L5	6M
	b)	A firm"s sales during the year was Rs. 4,00,000 of which 60 percent were on credit basis. The balance of debtors at the beginning and end of the year were 25,000 and 15,000 respectively. Calculate debtors turnover ratio of the firm also finds out debtcollection period.	L6	6M

OR

10. Journalize the following transactions in the books of Ravi   L3   12M

2012, Jan 1	Ravi commenced business with cash Rs.2,00,000
2	Purchased goods for cash Rs.10,000
3	Purchased goods from Mohan Rs.6,000
7	Paid into bank Rs.5,000
10	Purchased furniture Rs.2000
20	Sold goods to Suresh on credit Rs.5,000
25	Cash sales Rs. 3,500
26	Paid to Mohan on account Rs.3,000
31	Paid salaries Rs.2,800

Q.P. Code: 20CE0125   R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
ENVIRONMENTAL ENGINEERING
(CE)

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

UNIT-I

1.	a)	Explain the factor affecting the per capita demand.	L2	6M
	b)	Draw the flow chart of public water supply system.	L2	6M

OR

2.	a)	Write short notes on design period considering the various factors.	L1	6M
	b)	Briefly explain about the domestic demand and fire demand.	L2	6M

UNIT-II

3.	a)	Write short notes on types of screens.	L1	5M
	b)	The maximum daily demand at a water purification plant has been estimated as 12 million liters per day. Design the dimensions of a suitable sedimentation tank for the raw supplies, assuming a detention period of 6 hours and the velocity of flow as 20cm per minute.	L4	7M

OR

4.	a)	Briefly explain any three chemical characteristics of water.	L2	6M
	b)	Write short notes on different water borne diseases.	L1	6M

UNIT-III

5.		With neat sketch, explain the house service connection from a street main to a house.	L2	12M

OR

6.	a)	What are the requirements of a distribution system?	L1	6M
	b)	Write short notes on methods of distribution system.	L1	6M

UNIT-IV

7.		The sewage flows from a primary settling tank to a standard trickling filter a t a rate of 5 MLD having a 5-day BOD of 150 mg/L. Determine the depth and the volume of the filter, adopting a surface loading of 2500 l/m2 /day and an organic loading of 165 g/m3 /day. Also, determine the efficiency of the filter unit, using NRC formula.	L4	12M

OR

8.	a)	Define screen and list the types of screens used in sewage treatment.	L1	5M
	b)	Design a primary sedimentation for treating 1 MLD of wastewater. Make suitable assumptions.	L4	7M

UNIT-V

9.	a)	Write short notes on sludge digestion.	L1	6M
	b)	Briefly explain the process involved in self-purification.	L2	6M

OR

10.		Discuss the criterion for design of a septic tank.	L2	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
MICROPROCESSORS AND MICROCONTROLLERS
(EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	a)	Define instruction and how it can be expressed in terms of symbolic code give example.	L1	4M
	b)	List different computer languages and explain them.	L3	8M
		OR		
2.	a)	List out the advantages in memory technology.	L2	4M
	b)	Explain the difference between the peripheral I/O and memory mapped I/O.	L2	8M

UNIT-II

3.	a)	With a neat sketch and explain, the De-multiplexing of the Bus AD7-AD0 in 8085.	L2	6M
	b)	Draw the timing diagram for transfer of byte from memory to microprocessor.	L4	6M
		OR		
4.	a)	Discuss CMA, RAR, RAL, RLC and RRC instructions with suitable example.	L2	6M
	b)	Explain the branch control instructions of the 8085 microprocessor.	L2	6M

UNIT-III

5.	a)	Explain about program counter and data pointer.	L2	6M
	b)	Discuss about flags and program status word in 8051 MC.	L2	6M
		OR		
6.	a)	Describe the vector address of interrupts in 8051 µC.	L2	6M
	b)	Define draw the formats for IP and TCON register. 8051µC.	L2	6M

UNIT-IV

7.	a)	Describe the different types of addressing mode supported by 8051 with suitable examples.	L2	6M
	b)	Explain the function of stack and data exchanges instruction with an example.	L2	6M
		OR		
8.	a)	Discuss the interrupts and interrupt handler subroutines.	L2	6M
	b)	Explain the following terms i) Call and stack ii) calls and returns iii) interrupts and returns.	L2	6M

UNIT-V

9.	a)	Discuss about interrupt driven program for small keyboards.	L2	6M
	b)	List out the types of led displays and draw the seven-segment display circuit used for SVNSEG program.	L3	6M
		OR		
10.	a)	Design and explain the A/D converter circuit.	L2	6M
	b)	Describe and design the hardware circuits for multiple interrupts.	L1	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar-2024
ANTENNAS AND WAVE PROPAGATION
(ECE)

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

UNIT-I

1.	a)	Define the following (i) Radiation Resistance (ii) Antenna Efficiency	L1	6M
	b)	Find the directivity of an antenna which has a radiation resistance of 80Ω and a loss resistance of 20Ω if the power gain is 10 dB.	L2	6M

OR

2.	a)	Write short notes on effective aperture.	L1	6M
	b)	Prove that the directivity of a $\lambda/2$ dipole is 2.15 dB.	L2	6M

UNIT-II

3.	a)	What are parasitic elements & where they are used?	L1	6M
	b)	Design Yagi-Uda antenna of six elements to provide a gain of 14dB if the operating frequency is 250 MHz.	L5	6M

OR

4.	a)	Define the following terms of Helical Antenna. i). Pitch Angle ii). Axial Ratio.	L1	6M
	b)	Discuss the design considerations of pyramidal horn antenna.	L2	6M

UNIT-III

5.	a)	Define the following (i)Half Power Beam Width (ii) First Null Beam Width	L1	6M
	b)	With neat diagrams, describe about various types of micro strip antennas.	L2	6M

OR

6.	a)	A parabolic dish provides a power gain of 60 dB at 15 GHz with 72% efficiency. Find out i)HPBW ii) FNBW iii) Diameter.	L2	6M
	b)	Describe the direct comparison method of measuring gain.	L5	6M

UNIT-IV

7.	a)	What are the different cases of arrays of two-point sources?	L1	4M
	b)	Deduce the characteristics of n-elements Broad side array.	L3	8M

OR

8.	a)	Derive the expression for the far field pattern of an array of 2 – isotropic point sources of equal amplitude and phase	L3	6M
	b)	Explain about the Binomial array.	L2	6M

UNIT-V

9.	a)	Explain the fundamentals of ground wave propagation.	L2	6M
	b)	A HF radio link has to be established between two points at a distance of 2500 Km on earth's surface considering the ionospheric height to be 200 Km and its critical frequency 5 MHz Calculate the MUF forthe given path.	L4	6M

OR

10.	a)	What are the different layers of ionosphere? Briefly discuss them.	L1	6M
	b)	Explain the energy loss in Ionosphere.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar-2024
ARTIFICIAL INTELLIGENCE
(CSE)

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

UNIT-I

1.	a)	Define Artificial Intelligence and identify the strong, weak AI.	L1	6M
	b)	Discuss in detail an importance of AI.	L2	6M

OR

2.	a)	Illustrate any four PEAS description of the task environment for intelligent agents and explain it.	L2	6M
	b)	Difference between Forward chaining and Backward Chaining.	L2	6M

UNIT-II

3.	a)	Illustrate the concept of Problem-solving agent with an example.	L3	6M
	b)	Design and Solve Vacuum Cleaner toy problem in AI.	L6	6M

OR

4.		What are the five uninformed search strategies? Explain any two in detail with example.	L2	12M

UNIT-III

5.		Describe the steps involved in the knowledge engineering process with example. Give the five logical connectives used to construct complex sentences and give the formal grammar of propositional logic.	L5	12M

OR

6.		Explain utility based system with neat sketch.	L2	12M

UNIT-IV

7.	a)	Define learning. Why learning is important.	L2	6M
	b)	Explain the various forms of Learning types.	L2	6M

OR

8.		Analyze the Decision Tree Learning with an example	L4	12M

UNIT-V

9.	a)	What do you mean by expert system technology? Explain.	L1	6M
	b)	Distinguish between forward chaining and backward chaining.	L2	6M

OR

10.	a)	What is Rule-based Systems? How Forward Chaining and Backward Chaining is used in Rule-based System.	L1	6M
	b)	Distinguish Model-based Expert system Vs Case based expert system.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
METROLOGY AND MEASUREMENTS
(MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	a)	Give a brief description on Maximum, Minimum Metal limits with the help of neat sketches.	L1	6M
	b)	Enumerate the differences between unilateral and bilateral tolerance system.	L2	6M

OR

2.	a)	Distinguish between Hole based system and Shaft based system of fits.	L2	6M
	b)	What do you mean by deviation? Explain types of deviations with the help of neat sketches.	L2	6M

UNIT-II

3.		State the principle of a micrometer. Explain an outside micrometer with a neat Sketch.	L2	12M

OR

4.		State the list the angular measuring instruments. Explain Vernier bevel protractor with suitable diagram.	L1	12M

UNIT-III

5.		Briefly describe the construction, principle, and operation of Talysurf with a neat sketch.	L2	12M

OR

6.		Sketch and explain working and application of versatile instrument of toolmakers microscope.	L3	12M

UNIT-IV

7.	a)	State and explain the various types of angular speed measurement tachometers.	L1	6M
	b)	Give a brief outline on direct current tachometer generator.	L2	6M

OR

8.		What do you understand about measurement of torque? Discuss about strain gauge torque meter.	L2	12M

UNIT-V

9.		Sketch a Mcleod gauge and explain working principle and its applications, limitations.	L2	12M

OR

10.		Explain the measurement of pressure by Dead Weight gauge with neat sketch and list the advantages, limitations, and applications.	L2	12M

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SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
EMBEDDED SYSTEMS AND IOT
(ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	a)	Define embedded processor and list out various types of embedded processors.	L1	6M
	b)	Illustrate the RS-232 and RS-485 interfaces in embedded systems.	L2	6M

OR

2.	a)	Describe the IDE tools for developing application on embedded system.	L2	6M
	b)	Discuss Watchdog Timer and Embedded Firmware.	L2	6M

UNIT-II

3.	a)	With a neat sketch, explain the Logical Design of an IoT.	L2	6M
	b)	Explain in brief IoT applications.	L2	6M

OR

4.	a)	Classify the protocols associated with network/internet layer of IoT.	L3	6M
	b)	Explain how IoT technology can used in cities the following application areas: (i) Smart Parking system (ii) Smart roads.	L3	6M

UNIT-III

5.		Develop a program for LCD and Keyboard programming interface for an Arduino.	L4	12M

OR

6.	a)	Define M2M and List out the communication protocols used for M2M local area networks.	L2	6M
	b)	Write a program to control DC motor using PWM technique.	L3	6M

UNIT-IV

7.	a)	With an example elaborate the functions and modules in python.	L2	6M
	b)	Distinguish between a Physical entity and virtual entity.	L3	6M

OR

8.	a)	Describe the packages used in python.	L2	6M
	b)	With relevant examples discuss about classes in python.	L2	6M

UNIT-V

9.	a)	Classify the various versions of raspberry pi devices till date.	L3	6M
	b)	Write a short note on various raspberry pi interfaces used for data transfer.	L2	6M

OR

10.	a)	Explain an IoT device & give some examples.	L2	6M
	b)	What is a module in python? Explain with an example.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year II Semester Supplementary Examinations Feb/Mar-2024

DESIGN OF MACHINE ELEMENTS-II
(MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. a) Explain what you understand by A.M. Wahl's factor and state its importance in the design of helical springs. — L2 — 4M

   b) A mechanism used in printing machinery consists of a tension spring assembled with a preload of 30 N. The wire diameter of spring is 2 mm with a spring index of 6. The spring has 18 active coils. The spring wire is hard drawn and oil tempered having following material properties: Design shear stress = 680 MPa, Modulus of rigidity = 80 kN/mm². Determine:
   (i) The initial torsional shear stress in the wire.
   (ii) Spring rate.
   (iii) The force to cause the body of the spring to its yield strength. — L5 — 8M

OR

UNIT-II

2. Design and draw a valve spring of a petrol engine for the following operating conditions :
   Spring load when the valve is open = 400 N
   Spring load when the valve is closed = 250 N
   Maximum inside diameter of spring = 25 mm
   Length of the spring when the valve is open= 40 mm
   Length of the spring when the valve is closed= 50 mm
   Maximum permissible shear stress = 400 MPa — L6 — 12M

OR

3. Select a suitable spherical roller bearing from SKF series 222C to support a radial load of 4 kN and axial load of 2 kN. Minimum life required is 10000 hrs at 1000 rpm. For this select bearing find
   (i) The expected life under the given loads
   (ii) The equivalent load that can be supported with a probability of survival of 95% with 10000 hours. — L6 — 12M

UNIT-III

4. Design a journal bearing for a centrifugal pump with the following data.
   Diameter of journal =150 mm
   Load on bearing =40 kN
   Speed of journal =900 rpm — L6 — 12M

OR

5. The horizontal section of crane hook is symmetrical trapezium 120 mm deep, the inner width being 90 mm and outer width being 30 mm. The hook is made of plain carbon steel 45C8 (σ_{yt}= 380 N/mm^2) and the factor of safety is 3.5. Determine the load carrying capacity of the hook. Also draw the crane hook and show the location at which maximum stress is acting. — L4 — 12M

OR

6. A belt drive consists of two V-belts in parallel, on grooved pulleys of — L5 — 12M

the same size. The angle of the groove is 30°. The cross-sectional area of each belt is 750 mm² and μ = 0.12. The density of the belt material is 1.2 Mg / m³ and the maximum safe stress in the material is 7 Mpa. Calculate the power that can be transmitted between pulleys of 300 mm diameter rotating at 1500 r.p.m. Find also the shaft speed in r.p.m. at which the power transmitted would be a maximum.

UNIT-IV

7. A pair of straight spur gears is required to reduce the speed of shaft from 500 to 100 rpm while continuously running 12 hr per day. The pinion is of 40C8 steel and has 20 teeth. The wheel is of cast iron of grade FG200 and has 100 teeth. The gears are of 8mm module, 100 mm face width and 20⁰ pressure angle. Calculate power rating. — L5 — 12M

OR

8. A pair of helical gears is to transmit a power of 15 kW. The teeth are 200 stub in diametral plane and have helix angle of 450. The pinion runs at 10,000 rpm and has 80 mm pitch diameter. The gear has 320 mm pitch diameter. If the gears are made of cast steel having allowable static strength of 100 MPa; determine a suitable module and face width from static strength considerations and check the gears for wear assuming σ_{es} = 618 MPa. — L5 — 12M

UNIT-V

9. Design a plain carbon steel centre crank shaft for a single acting four stroke single cylinder engine for the following data:
   Bore = 400 mm; Stroke = 600 mm; Engine speed = 200 r.p.m; Mean effective pressure = 0.5 N/mm²; Maximum combustion pressure = 2.5 N/mm²; Weight of fly wheel used as a pulley = 50 kN; Total belt pull = 6.5 kN.
   When the crank has turned through 35 degrees from the top dead centre, the pressure on the piston is 1 N/mm² and torque on the crank is maximum. The ratio of the connecting rod length to the crank radius is 5. Assume any other data required for the design. — L6 — 12M

OR

10. A pair of cast iron bevel gears connects two shafts at right angles. The pitch diameter of the pinion and gear are 80 mm and 100 mm respectively. The tooth profiles of the gear are of 14 ½ degrees composite form. The allowable static stress for both the gears is 55 MPa. If the pinion transmits 2.75 kW at 1100 r.p.m., find the module and number of teeth on each gear from the standpoint of strength and check the design from the standpoint of wear.. Take surface endurance limit as 630 MPa and modulus of elasticity for cast iron as 84kN/mm². — L5 — 12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
NON-CONVENTIONAL ENERGY RESOURCES
(MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.		Name the types of solar radiation measuring instruments? Explain the Working of Sunshine recorder with a neat sketch.	L1	12M

OR

2.	a)	Discuss about Secondary Energy Sources in detail.	L2	6M
	b)	Illustrate the working of thermal power plant with a neat sketch.	L4	6M

UNIT-II

3.	a)	Explain about Solar Radiation.	L3	6M
	b)	Outline the challenges and remedies associated in the use of solar energy.	L4	6M

OR

4.		Illustrate the functions of various components in flat plate collectors.	L4	12M

UNIT-III

5.		Illustrate the power generation process in HAWT with its merits and demerits.	L4	12M

OR

6.	a)	Describe the working of VAWT with a neat sketch.	L5	6M
	b)	Outline the advantages and disadvantages of VAWT.	L3	6M

UNIT-IV

7.	a)	Define biomass and why is it called renewable energy?	L2	6M
	b)	What are the different forms of bio-energy?	L2	6M

OR

8.	a)	What are the factors affecting the generation of biogas?	L3	6M
	b)	Explicate various steps involved in the production of Ethanol.	L4	6M

UNIT-V

9.		What is tide? Explain the basic components of a tidal power plant and state their merits and demerits.	L3	12M

OR

10.	a)	What is the geothermal energy? Explain its extraction process.	L2	6M
	b)	Explain Geothermal binary cycle power plant with neat diagram.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
MICROWAVE THEORY & TECHNIQUES
(ECE)

Time: 3 Hours　　　　　　　　　　　　　　　　　　　　Max. Marks: 60

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

UNIT-I

1.	a)	Mention the different microwave regions and band designations based on the IEEE standards.	L1	6M
	b)	A rectangular waveguide has a=3.5cms, b=2cms as its sectional dimensions. Predict all the modes which will propagate at 4000MHz.	L2	6M

OR

2.	a)	Derive the equation for wave impedance in TM mode.	L3	6M
	b)	Explain about power transmission and power losses in a rectangular wave guide.	L2	6M

UNIT-II

3.	a)	Derive expression for f_0 in rectangular cavity resonator.	L3	6M
	b)	Explain the working of Microstrip line and draw its field distribution diagram.	L1	6M

OR

4.	a)	What is non-TEM line? Express its equation for V-I.	L1	6M
	b)	Deduce the S-matrix for Gyrator.	L4	6M

UNIT-III

5.	a)	Explain the following i)　　Waveguide posts　　and　　ii) Tuning Screws	L2	6M
	b)	Explain about Rotary Vane Attenuator	L2	6M

OR

6.	a)	Explain the working of Directional Coupler with suitable diagram & Express its Coupling factor and directivity.	L3	6M
	b)	What is the principle of phase shifter? Discuss the working mechanism of rotary vane phase shifter with neat sketch.	L1	6M

UNIT-IV

7.	a)	Explain the velocity modulation process in two cavity Klystron tube.	L2	6M
	b)	A two-cavity klystron amplifier has the following characteristics: Voltage gain = 13 dB, Input Power = 4 mW, R_{sh} of input cavity = 25 k ohm, R_{sh} of output cavity =30 k ohm, load impedance = 35 k ohm. Find input rms voltage and the output rms voltage.	L3	6M

OR

8.	a)	Write a detailed note on cylindrical magnetron and derive the expression for Hull cut- off voltage.	L3	6M
	b)	List out the applications of travelling wave tube.	L1	6M

UNIT-V

9.	a)	What are the precautions to be taken while setting up microwave bench for measurement of various parameters? Explain.	L1	6M
	b)	Mention the different methods used for power calculation and explain any one method with a neat diagram.	L2	6M

OR

10.	a)	Explain how Low values of VSWR can be measured directly from the VSWR meter using the experimental set-up	L2	6M
	b)	With the help of wave meter method explain the microwave frequency measurement.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
WEB TECHNOLOGIES
(CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	a)	Explain in Detail about Multimedia with example.	L6	6M
	b)	Discuss working with images with suitable example.	L2	6M

OR

2.	a)	What is CSS? Explain with syntax.	L6	4M
	b)	Distinguish between CSS and CSS 5.0.	L2	8M

UNIT-II

3.	a)	Explain functions in JavaScript.	L2	6M
	b)	Discuss few operators in JavaScript with example.	L1	6M

OR

4.	a)	Write a JavaScript validation for creating registration form.	L1	8M
	b)	Explain JavaScript arrays?	L5	4M

UNIT-III

5.	a)	List out some of the HTML intrinsic event attributes with suitable examples.	L1	6M
	b)	Discuss the functions of doGet() and doPost() methods.	L2	6M

OR

6.	a)	Explain the lifecycle of servlets.	L1	6M
	b)	Discuss about the servlet architecture.	L2	4M

UNIT-IV

7.	a)	Write program to find average of first ten natural numbers using for loop.	L6	6M
	b)	Elaborate SAX-Transforming XML documents.	L2	6M

OR

8.	a)	Explain the difference between Session and Cookie?	L6	8M
	b)	Discuss XML Namespaces.	L6	4M

UNIT-V

9.	a)	Discuss about Web services?	L2	6M
	b)	Explain AJAX with suitable example.	L1	6M

OR

10.	a)	Illustrate XML is changing the Web?	L2	6M
	b)	Briefly explain simple AJAX application.	L6	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
CONCRETE TECHNOLOGY
(CE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	a)	What do you mean by soundness of aggregate? Explain.	L1	6M
	b)	What is alkali-aggregate reaction? And how will it affect the concrete properties.	L1	6M

OR

2.		What are Bouge's compounds? Explain in detail how each one of these compounds influences the strength and setting properties of cement.	L1	12M

UNIT-II

3.	a)	Explain the Maturity concept for strength development of concrete.	L2	6M
	b)	The strength of a sample of fully matured concrete is found to be 60 MPa. Find the strength of identical concrete at the age of 14 days when cured at an average temperature during day time at 25°C and night time at 15°C.	L3	6M

OR

4.		With neat diagram, write the procedure involved in determining the split tensile strength of concrete.	L2	12M

UNIT-III

5.		Explain Schmidt's Rebound Hammer test and the limitations and applications of the same.	L2	12M

OR

6.	a)	What is shrinkage of concrete?	L1	6M
	b)	Explain the various factors affecting shrinkage of concrete.	L2	6M

UNIT-IV

7.		Explain the phenomenon of corrosion in steel. Suggest the methods for corrosion control.	L2	12M

OR

8.		Write briefly about deterioration of concrete by Abrasion, Erosion and Cavitation.	L1	12M

UNIT-V

9.		Explain the mix design procedure of concrete as per ACI code Method.	L2	12M

OR

10.		Design a M20 concrete mix using IS method of Mix Design for the following data:	L3	12M

     1) Maximum size of aggregate   - 20mm (Angular)
     2) Degree of workability   - 0.90 compaction factor.
     3) Quality control   - good
     4) Type of exposure   - Severe
     5) Specific Gravity   A. Cement   - 3.12
                          B. Sand   - 2.63
                          C. Coarse aggregate   - 2.666
     6) Water absorption: A. Coarse aggregate   - 0.5%
                          B. Fine aggregate   - 1.0%
     7) Free surface moisture: A. Coarse aggregate - Nil
                          B. Fine aggregate   - 2.2%
     8) Sand confirms to Zone III grading.
Assume any other data required suitably.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
POWER SEMICONDUCTOR DRIVES
(EEE)

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

UNIT-I

1.	With neat diagram, explain 1-Ø fully controlled converter fed by separately excited DC motor in continuous conduction mode.	L1	12M

OR

2.	Explain the operation of 3-Ø half controlled converter fed by DC series motor with necessary waveforms.	L2	12M

UNIT-II

3.	A 220V, 970 rpm, 100A dc separately excited motor has an armature resistance of 0.05Ω. It is Braked by plugging from an initial speed of 1000rpm. Calculate. (a) Resistance to be placed in armature circuit to limit braking current to twice the full load value, (b) Braking torque (c) Torque when the speed has fallen to zero.	L4	12M

OR

4.	With a neat diagram, explain the four-quadrant operation of a DC drive in all four quadrants When fed by a Three phase non circulating dual converter.	L2	12M

UNIT-III

5.	Explain the operation of second quadrant chopper fed by separately excited DC motor with necessary waveforms.	L2	12M

OR

6.	a)	Explain the closed loop speed control of dc motor and show how it can be achieved by a chopper.	L2	6M
	b)	A 230V, 10A, 1500rpm separately excited dc motor with armature resistance of 1.5Ω motor operates under dynamic braking with chopper control. Braking resistance has a value of 15Ω. (i) Calculate the duty ratio of chopper for motor speed of 1200rpm and braking torque equal to 2 times the rated motor torque. (ii) What will be the motor speed for duty ratio of 0.6 and motor torque equal to twice the rated torque?	L2	6M

UNIT-IV

7.	a)	Comparison of VSI Drive with CSI Drive?	L2	6M
	b)	Explain speed –torque characteristics of current source inverter	L2	6M

OR

8.	Explain briefly voltage source inverter control of induction motor?	L2	12M

UNIT-V

9.	Explain load commutated current source inverter fed synchronous motor.	L2	12M

OR

10.	A 3 phase, 400 Volt, 50 Hz, 6 pole, star connected, wound rotor synchronous motor has Zs=0+j2 Ω. Load torque proportional to speed2, is 340 NM at rated synchronous speed. The speed of the motor is lowered by keeping V/F constant maintain unity power factor by field control of the motor. For the motor operation at 600 rpm, calculate
	   (i) Supply voltage (ii) Armature current
	   (iii) Excitation angle (iv) Load angle
		L2	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
AUTOMOBILE ENGINEERING
(MECH)

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

UNIT-I

1.	a)	Describe how power is transmitted from engine to wheels of a motor Vehicle. Explain the function of main units involved.	L2	6M
	b)	Classify the automobile Engines.	L2	6M

OR

2.	a)	Discuss the construction and working of various frames used in automobile.	L2	6M
	b)	Mention the various functions of chassis.	L3	6M

UNIT-II

3.	a)	Discuss in detail about the CRDI engines.	L2	6M
	b)	Differentiate between MPFI and CRDI fuel injection systems.	L2	6M

OR

4.	a)	What do you know about the emission norms? Discuss.	L2	6M
	b)	How multi point fuel injection in SI engine affects emissions from the engine?	L1	6M

UNIT-III

5.	a)	What are the functions of Engine Lubrication system?	L1	6M
	b)	Is the lubricant used in 2- stroke and 4- stroke engines same? Explain.	L4	6M

OR

6.	a)	Name various types of components used in Lighting System of an automobile with neat sketch.	L1	6M
	b)	Describe the circuit diagram of a Horn System.	L2	6M

UNIT-IV

7.		Classify different types of clutches used in an automobile? Explain any one of them with a neat diagram.	L2	12M

OR

8.	a)	Elucidate the working of constant mesh gear box with a neat diagram.	L1	6M
	b)	With the help of a neat diagram illustrate the working of a torque.	L2	6M

UNIT-V

9.	a)	What are the different types of steering gears used in an automobile and mention the advantages of each gear.	L2	6M
	b)	What are the functions and components of the steering system?	L2	6M

OR

10.	a)	With the help of a neat diagram, explain the working of Wishbone type independent suspension system.	L2	6M
	b)	With a neat diagram, explain the construction and operation of a shock absorber.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
FIBER OPTIC COMMUNICATIONS
(ECE)

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

UNIT-I

1. a) Derive the expression for i) Critical angle. ii) Numerical aperture iii) Snell's law.　　　　　　　　　　　　　　　　　　　　　L3　6M

b) A light ray is incident from medium-1 to medium-2. If the refractive indices of medium-1 and medium-2 are 1.6 and 1.36 respectively, then evaluate the angle of refraction for an incident angle of 300.　　L4　6M

OR

2. a) What do you mean by pulse broadening? Explain its effect on information carrying capacity of a fiber.　　　　　　　　　L2　6M

b) Define group velocity, Illustrate the impact of group delays in optical communication.　　　　　　　　　　　　　　　　　　L2　6M

UNIT-II

3. a) Explain about the surface emitter LED with neat diagram.　　L2　6M

b) Illustrate the working principle of an edge emitter LED with neat diagram.　　　　　　　　　　　　　　　　　　　　　　　L2　6M

OR

4. a) Compute the rate equation for LASER diode.　　　　　　　　L3　6M

b) Illustrate about external quantum efficiency of LASER.　　　L2　6M

UNIT-III

5. a) Summarize the comparisons of photo detectors.　　　　　　L2　4M

b) Explain the characteristics of fundamental optical receiver operation.　L4　8M

OR

6. a) Construct the optical receiver configuration.　　　　　　　　L2　6M

b) Explain about the probability of error in detail.　　　　　　L2　6M

UNIT-IV

7. a) List the types of budgets in optical communication system.　L1　4M

b) Illustrate in detail about Link power budget.　　　　　　　　L2　8M

OR

8. a) Explain in detail about Optical amplifier with an example.　　L2　8M

b) List the applications of Optical amplifier　　　　　　　　　L1　4M

UNIT-V

9. Explain in detail about Optical network topologies.　　　　　　L2　12M

OR

10. a) Explain in brief about the working principle of WDM　　　　L2　6M

b) What are the characteristics of WDM?　　　　　　　　　　　L1　6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
MACHINE LEARNING
(CSE)

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

UNIT-I

1.	a)	Compare Machine Learning and Artificial Intelligence.	L6	6M
	b)	Describe classification techniques in supervised learning with example.	L2	6M

OR

2.	Analyze the classification and regression techniques in supervised learning.	L4	12M

UNIT-II

3.	a)	Differentiate Supervised Learning and Unsupervised Learning.	L4	5M
	b)	Explain Decision Tree Classification technique with an example.	L2	7M

OR

4.	a)	Express the Evaluation of Estimator bias and variance.	L6	6M
	b)	Illustrate Gradient descent algorithm and its variants.	L3	6M

UNIT-III

5.	a)	Illustrate the mixtures of latent variable models.	L3	6M
	b)	How mixture density is calculated in unsupervised learning?	L1	6M

OR

6.	a)	Demonstrate linkage methods in Hierarchical Clustering.	L2	6M
	b)	How can we measure the distance between two clusters?	L1	6M

UNIT-IV

7.	a)	State and explain Non Parametric Density Estimation.	L1	6M
	b)	Explain Histogram Estimator with simple example.	L2	6M

OR

8.	a)	Summarize the following terms i) Distances ii) Euclidian distance iii) metrics	L2	6M
	b)	Analyze the supervised learning after clustering.	L4	6M

UNIT-V

9.	a)	Explain about the Reinforcement learning Techniques and itselements.	L2	8M
	b)	Compare unsupervised learning and Reinforcement learning.	L4	4M

OR

10.	a)	Explain Generalization process in Temporal difference Learning.	L2	6M
	b)	How does Reinforcement Learning Work.	L1	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
FUNDAMENTALS OF URBAN PLANNING
(EEE, MECH & CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	a)	Describe the guiding principles of town planning?	L1	8M
	b)	What are the contributing forces of the origin of towns and cities?	L1	4M

OR

2.	a)	Explain various stages in town development given by Sir Patrick, Lewis Mumford & Griffith Taylor.	L2	8M
	b)	Explain in detail the various categories of Indian villages.	L2	4M

UNIT-II

3.	a)	What is functional survey? Mention the information collected in functional survey.	L1	6M
	b)	What is social survey? Mention the information collected in functional survey.	L1	6M

OR

4.	a)	What is meant by term zoning?	L1	6M
	b)	What are the various objects of zoning?	L1	6M

UNIT-III

5.	a)	What are the various measures taken for Slum clearance and re-housing.	L1	6M
	b)	Write short notes on financial assistance for slum clearance.	L1	6M

OR

6.	a)	What do you mean by skyscrapers?	L1	4M
	b)	Explain in detail about the argument for and against the skyscrapers.	L1	8M

UNIT-IV

7.	a)	Write a detail note on requirements of an industry.	L1	6M
	b)	What are the measures to control the location of industries?	L1	6M

OR

8.	a)	Explain various responsibility of a building owner.	L2	6M
	b)	What is the applicability of bye-laws?	L1	6M

UNIT-V

9.	a)	Mention the requirements of a good city road.	L1	6M
	b)	Discuss the causes for traffic congestion.	L2	6M

OR

10.	a)	Draw the neat sketches of traffic islands for the road junctions with four streets.	L1	6M
	b)	Explain with the help of neat sketches various arrangements of the street lights.	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester Supplementary Examinations Feb/Mar- 2024
INTELLECTUAL PROPERTY RIGHTS
(ECE & CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1.	a)	Describe the importance of intellectual property rights?	L2	6M
	b)	Explain the design holder and the associated rights: an insight.	L1	6M

OR

2.		What is a Geographical Indication (GI)? Describe the Registration process of Geographical Indications.	L1	12M

UNIT-II

3.	a)	Explain about purpose and functions of Trademark?	L2	6M
	b)	Explain Federal Registration of Trademarks?	L2	6M

OR

4.		Explain the procedure for Trademark registration process?	L2	12M

UNIT-III

5.	a)	Explain the fundamental of Copyright Law?	L2	6M
	b)	Describe the Rights afforded by Copyright Law?	L2	6M

OR

6.	a)	Differentiate between Copyright infringement and Trademark infringement.	L2	6M
	b)	Differentiate types of copyrights in cinema autography in India?	L2	6M

UNIT-IV

7.	a)	Discuss why the trade secrets law is developed internationally?	L2	6M
	b)	List out the liabilities for misapplication of Trade Secrets?	L1	6M

OR

8.		Explain in briefly about false advertising with an example and how it affects the IPR.	L2	12M

UNIT-V

9.	a)	Discuss New Developments in Patent Law?	L2	6M
	b)	Explain about patent law treaty with suitable examples?	L2	6M

OR

10.		Explain how a copyright protection is overcoming the cybercrime?	L2	12M