Q.P. Code: 23HS0803 **R23**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR

(AUTONOMOUS)

B.Tech I Year I Semester Regular Examinations Jan/Feb 2024

ENGINEERING CHEMISTRY

(MECH)

Time: 3 Hours Max. Marks: 70

PART-A

(Compulsory Question)

1. Answer the following: (10 X 02 = 20 Marks)

a)	Define the Temporary hardness.	L1	2M
b)	Define the Permanent hardness.	L1	2M
c)	What is Primary battery with example.	L1	2M
d)	What is Secondary battery with example.	L1	2M
e)	What is Polymerization.	L1	2M
f)	Define Biofuel.	L1	2M
g)	Define Composite.	L1	2M
h)	Define the Refractories.	L1	2M
i)	Explain about Micelle.	L1	2M
j)	Define Nanomaterials.	L1	2M

PART-B

(Answer all the questions: 05 X 10 = 50 Marks)

UNIT-I

2.		Describe the estimation of hardness by EDTA method.	L3	10M
		OR		
3.	a)	Define hardness. Distinguish between hard water and soft water.	L3	5M
	b)	How do you estimate dissolved oxygen in water by Winkler's method.	L4	5M

UNIT-II

4.		Derive the Nernst equation for a single electrode potential and write its applications.	L2	10M
		OR		
5.	a)	Write a note on Zinc-air battery.	L1	5M
	b)	Explain the Construction and working of NiCad battery.	L2	5M

UNIT-III

6.	a)	Distinguish between Thermoplastics and Thermosetting plastics.	L1	5M
	b)	What is functionality of monomer?	L4	5M
		OR		
7.		Describe the fractional distillation of petroleum.	L3	10M

UNIT-IV

8.		Explain in detailed about manufacture of Portland Cement?	L2	10M
		OR		
9.	a)	Determine the viscosity of lubricating oil by Redwood Viscometer.	L2	5M
	b)	Discuss the applications of refractory materials.	L2	5M

UNIT-V

10.		Discuss about applications of nanomaterials.	L2	10M
		OR		
11.	a)	Discuss the synthesis of colloids by Braggs method.	L1	5M
	b)	Write a note on Micelle formation.	L1	5M

Q.P. Code: 23HS0801 R23

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech I Year I Semester Regular Examinations Jan/Feb 2024
CHEMISTRY
(CSM, CAD, CIA)

Time: 3 Hours Max. Marks: 70

PART-A
(Compulsory Question)

1.	**Answer the following: (10 X 02 = 20 Marks)**			
	a)	Define Quantum mechanics	L1	2M
	b)	Draw the MO diagram of Li_2 Molecule	L3	2M
	c)	Differentiate intrinsic and extrinsic semiconductors	L2	2M
	d)	List out any two applications of CNT	L1	2M
	e)	Illustrate redox reactions involved in galvanic cell	L3	2M
	f)	Give examples for primary and secondary battery.	L2	2M
	g)	Write the reactions involved in the preparation of Buna S rubber.	L1	2M
	h)	Explain the preparation of Polyacetylene?	L2	2M
	i)	State Beer-Lambert's law	L1	2M
	j)	List out any two applications of HPLC	L1	2M

PART-B
(Answer all the questions: 05 X 10 = 50 Marks)

UNIT-I

2.		Derive the Schrodinger wave equation. Mention its significance	L4	10M
		OR		
3.		Explain the energy level diagram of CO and find the bond order.	L2	10M

UNIT-II

4.		Describe N and P doping in semiconductors	L2	10M
		OR		
5.	a)	Classify various types of super conductors	L4	5M
	b)	Discuss the properties and applications of fullerene	L4	5M

UNIT-III

6.	a)	Explain the working principle of Zn-Air battery.	L2	5M
	b)	Distinguish between primary cell and secondary cell.	L4	5M
		OR		
7.		Derive Nernst Equation for calculating electrode potential.	L4	10M

UNIT-IV

8.		Write short notes on bio-degradable polymers.	L1	10M
		OR		
9.	a)	Discuss preparation and properties of Buna-S, Buna-N-reparation	L4	5M
	b)	Illustrate the mechanism of free radical polymerization with example.	L3	5M

UNIT-V

10.		Describe the working principle of HPLC with a neat diagram.	L2	10M
		OR		
11	a)	Explain various electronic transitions in UV-Visible spectroscopy.	L2	5M
	b)	Discuss the Instrumentation of IR spectroscopy	L4	5M

Q.P. Code: 23HS0840 R23

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Regular Examinations Jan/Feb 2024
ENGINEERING PHYSICS
(EEE, ECE & CSE)

Time: 3 Hours Max. Marks: 70

PART-A
(Compulsory Question)

1. Answer the following: (10 X 02 = 20 Marks)

a)	Define Interference of light with examples.	L1	2M
b)	Generalize dispersive power of a grating with a relevant expression.	L3	2M
c)	Summarize seven crystal systems.	L6	2M
d)	Distinguish between the crystalline and amorphous materials.	L4	2M
e)	Produce relation between dielectric constant and susceptibility.	L3	2M
f)	Distinguish between soft and hard magnetic materials.	L2	2M
g)	What are the drawbacks of classical free electron theory?	L1	2M
h)	State Heisenberg's uncertainty principle.	L3	2M
i)	What is n-type and p-type semiconductors.	L1	2M
j)	Produce fermi level variations in case of conductors, semiconductors and insulators?	L3	2M

PART-B
(Answer all the questions: 05 X 10 = 50 Marks)

UNIT-I

2.	Deduce the conditions for bright band and dark band of interference in thin film by reflection.	L3	10M
	OR		
3.	Derive the conditions for maxima and minima of intensities in Fraunhofer diffraction due to single slit.	L3	10M

UNIT-II

4.	Determine the packing fraction of BCC and FCC structures.	L3	10M
	OR		
5.	Explain the crystal structure determination by powder method with a neat diagram.	L2	10M

UNIT-III

6.	Evaluate the expression for total polarizability.	L5	10M
	OR		
7.	Classify the magnetic materials based on magnetic moment.	L4	10M

UNIT-IV

8.	Define the significance of wave function and write Schrodinger's time dependent wave equation.	L1	10M
	OR		
9. a)	Explain the merits of classical free electron theory.	L2	5M
b)	Derive the Fermi-Dirac distribution function with temperature.	L3	5M

UNIT-V

10.	Deduce the expression for Hall coefficient in Hall effect along with its applications.	L3	10M
	OR		
11. a)	Derive the equations of drift and diffusion currents in semiconductors.	L3	5M
b)	Produce the Einstein's equation.	L3	5M

Q.P. Code: 23HS0830 R23

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B. Tech I Year I Semester Regular Examinations Jan/Feb 2024

LINEAR ALGEBRA & CALCULUS

(Common to all)

Time: 3 Hours Max. Marks: 70

PART-A

(Compulsory Question)

1. **Answer the following: (10 X 02 = 20 Marks)**

a.	Define rank of the matrix.	L1	2M
b.	State Cauchy-Binet formulae.	L1	2M
c.	Define Eigen values and Eigen vectors of a matrix.	L1	2M
d.	Find the symmetric matrix corresponding to the quadratic form $ax^2 + 2hxy + by^2$	L1	2M
e.	Verify the Rolle's Theorem can be applied to the function f(x) = tan x in $[0,\pi]$	L1	2M
f.	Expand Taylor's series of the function f(x) in powers of (x-a).	L1	2M
g.	Define Continuity of a function of two variables at a point.	L1	2M
h.	If $x = u(1-v); y = uv$ *then prove that* $J\left(\frac{x,y}{u,v}\right) = u$	L2	2M
i.	Evaluate $\int_0^2 \int_0^x y\, dy\, dx$.	L1	2M
j.	Transform the integral into polar coordinates, $\int_0^a \int_0^{\sqrt{a^2-x^2}} (x^2+y^2)\, dy\, dx$.	L3	2M

PART-B

(Answer all the questions: 05 X 10 = 50 Marks)

UNIT-I

2. a) Reduce the matrix $A=\begin{bmatrix}1&2&3&2\\2&3&5&1\\1&3&4&5\end{bmatrix}$ into Echelon form and find its rank? L2 5M

b) Solve completely the system of equations x+2y+3z=0, 3x+4y+4z=0, 7x+10y+12z=0. L3 5M

OR

3. Express the following system in matrix form and solve by Gauss eliminationmethod. L3 10M

$2x_1 + x_2 + 2x_3 + x_4 = 6$; $6x_1 - 6x_2 + 6x_3 + 12x_4 = 36$;
$4x_1 + 3x_2 + 3x_3 - 3x_4 = -1$; $2x_1 + 2x_2 - x_3 + x_4 = 10$.

UNIT-II

4. Find the Eigen values and corresponding Eigen vectors of the matrix. L3 10M

$$A=\begin{bmatrix}6&-2&2\\-2&3&-1\\2&-1&3\end{bmatrix}$$

OR

5. Verify Cayley Hamilton theorem for $A=\begin{bmatrix}1&2&-1\\2&1&-2\\2&-2&1\end{bmatrix}$ and find A^{-1} *and* A^4 **using Cayley Hamilton theorem.** L3 10M

Q.P. Code: 23HS0830 R23

UNIT-III

6. a) Verify Rolle's Theorem for the function f(x) =$\log\left[\frac{x^2+ab}{x(a+b)}\right]$ in $[a, b]$; a,b>0 L3 5M

b) Verify Cauchy's mean value theorem for f(x) = e^x and g(x) = e^{-x} in [a, b]. L3 5M

OR

7. a) Test whether the Lagrange's Mean value theorem holds f(x) = $x^3 - x^2 - 5x + 3$ in [0,4] and if so find approximate value of c. L3 5M

b) Expand $\log_e x$ in powers of (x-1) and hence evaluate log 1.1 correct to 4 decimal places using Taylor's theorem. L3 5M

UNIT-IV

8. a) If $U = log(x^3+y^3+z^3-3xyz)$, prove that $\left(\frac{\partial}{\partial x}+\frac{\partial}{\partial y}+\frac{\partial}{\partial z}\right)^2 U = \frac{-9}{(x+y+z)^2}$. L2 5M

b) Expand $e^x siny$ in powers of x *and* y by Maclaurin series. L2 5M

OR

9. a) Verify if $u = 2x - y + 3z, v = 2x - y - z, w = 2x - y + z$ are functionally dependent and if so, find the relation between them. L3 5M

b) Find the shortest distance from origin to the surface $xyz^2 = 2$. L3 5M

UNIT-V

10. a) Evaluate $\int_0^5 \int_0^{x^2} x(x^2+y^2)dxdy$ L3 5M

b) Show that the area between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$ is $\frac{16}{3}a^2$. L3 5M

OR

11. a) Evaluate the integral by transforming into polar co-ordinates $\int_0^a \int_0^{\sqrt{a^2-x^2}} y\sqrt{x^2+y^2}\, dxdy$. L3 5M

b) Evaluate $\int_1^e \int_1^{\log y} \int_1^{e^x} \log z\, dzdxdy$. L3 5M

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Q.P. Code: 23HS0810 R23

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Regular Examinations Jan/Feb 2024
COMMUICATIVE ENGLISH
(MECH, CSM, CAD & CIA)

Time: 3 Hours Max. Marks: 70

PART-A
(Compulsory Question)
Answer the following: (10 X 02 = 20 Marks)

1.	a	What are the main characters in the Toys of Peace?	L1	2M
	b	Frame any two wh- type questions.	L3	2M
	c	Explain any two general strategies of Reading Comprehension.	L6	2M
	d	Differentiate past perfect and future perfect tense with an example.	L4	2M
	e	Mention any two capitalization rules.	L2	2M
	f	Make your own sentences by using the following Linkers. a.However b. Moreover	L3	2M
	g	What are the two key terms involved in listening comprehension?	L1	2M
	h	Frame two meaningful sentences by using homonyms.	L3	2M
	i	Della bought a gift to Jim. (Identify the Subject, Predicate in the sentence)	L1	2M
	j	What is Note making?	L3	2M

PART-B
(Answer all the questions: 05 X 10 = 50 Marks)

UNIT-I

2. List out all the Parts of Speech with examples. L3 10M

OR

3. How does the theme of sacrifice and value of relationship expressed in William O.Henry's Play? L3 10M

UNIT-II

4. Fill in the blanks with suitable articles. L3 10M
i) He has ..... one rupee note in pocket.
ii) Varanasi is ..... holy city.
iii) John is ..... European.
iv) She is ..... honest woman.
v) Honesty is ..... best policy.
vi). Sita's brother is .....engineer in .....reputed company.
vii). There is .....eucalyptus tree near my house.
viii. She is.... honorary secretary of the club.
ix). We met..... European girl in Rishikesh.
x). John uses ..... Internet a lot.

OR

5. Write a brief note on "The Brook" by Alfred Lord Tennyson. L2 10M

UNIT-III

6. a) What are the DOs and Don'ts of paraphrasing and classify it? L5 10M
b) Paraphrase the following short passage
The koala bear of Australia is a living "Teddy Bear." Its thick coat of gray fur is just as soft as the beloved toy. The koala has a large head, big ears and small, dark eyes that look at you without expression. Its nose, as black as patent leather, seems too big for the rest of its face. Long Beach City College WRSC. The koala is a gentle little animal. It is almost defenseless. Only its color protects it from enemies. The koala makes no nest. It just sits in the forked branches of a tree. Unlike a bird, it cannot balance itself with its tail—because it has no tail. It likes gum trees the best because it loves entirely on the leaves of the tree.

OR

7.		Write a note on biographical sketch of Elon Musk.	L5	10M

UNIT-IV

8.		What is the theme of "The Toys of Peace" by Saki?	L1	10M

OR

9.	a)	You are a student of Siddharth Institute of Engineering & Technology, Puttur. You are sick and need leave from college for two days. Write a letter to the Principal for the same.	L2	5M
	b)	Write a CV to apply for the job you dream of today.	L3	5M

UNIT-V

10. **Correct the following sentences** L3 10M
i. She has gone to school in the morning.
ii. It was raining since this morning.
iii. India will win Independence in 1947.
iv. She usually don't care of my advice.
v. If you get up early, you would not catch the bus.
vi. His health has improved since he leaves Bombay.
vii. If it dropped, it will break.
viii. He come yesterday to college.
ix. He has came this morning.
x. When I reached Shimla, it will be snowing.

OR

11	a)	What is formal oral presentation?	L3	5M
	b)	What are the steps involved in oral presentation?	L3	5M

Q.P. Code: 23EE0201 R23

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Regular Examinations Jan/Feb 2024
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(ECE, EEE & CSE)

Time: 3 Hours Max. Marks: 70

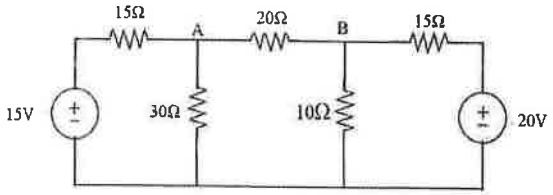
(Answer all the questions)
(Use Single Answer Booklet Only)

PART-A

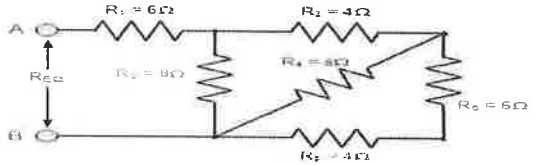
1.		**Answer all the Questions**		
	a	In Kirchhoff's Voltage Law, what is the relationship between the total voltage around a closed loop and the voltage drops across components?	L2	1M
	b	State Thevenin's Theorem and its purpose.	L2	1M
	c	What is the purpose of a transformer in an electrical system?	L1	1M
	d	What does a wattmeter measure, and how is it connected in a circuit?	L2	1M
	e	Explain the process of nuclear fission in the context of a nuclear power plant.	L2	1M

UNIT-I

2.	a)	Determine the current in branch A-B by using KVL	L3	6M



	b)	State and explain Kirchhoff's laws?	L1	4M
		OR		
3.	a)	Find equivalent resistance when three resisters are connected in parallel.	L3	4M
	b)	Find the equivalent resistance for the circuit shown below.	L3	6M



UNIT-II

4.		Explain Working Principle of 3-Ø Induction Motor in detail.	L2	10M
		OR		
5.	a)	Explain the operating principles of Moving Iron instruments	L2	5M
	b)	Determine the unknown resistance using Wheatstone bridge	L3	5M

UNIT-III

6.	a)	What are the working principles of fuse and MCB?	L1	4M
	b)	Define Earthing and explain the types of earthing	L1	6M
		OR		
7.		How does a nuclear plant work ? Explain with neat sketch.	L3	10M

PART-B

1.		Answer all the Questions		
	a	Differentiate between NPN and PNP transistors.	L3	1M
	b	What is the purpose of a flip-flop in digital circuits?	L2	1M
	c	Define the term "logic gate."	L1	1M
	d	What is the primary purpose of a Zener diode in a circuit?	L2	1M
	e	Explain the term "peak inverse voltage (PIV)" in the context of diodes in a rectifier.	L2	1M

UNIT-I

2.		with a neat sketch Explain the input and output and current gain characteristics of a transistor in common Emitter (CE) configuration.	L4	10M
		OR		
3.	a)	Define Zener diode and its characteristics	L3	5M
	b)	What is Zener effect?	L3	5M

UNIT-II

4.		Explain the working of a full wave bridge rectifier with a neat diagram with wave forms.	L1	10M
		OR		
5.		Draw the block diagram of Electronic Instrumentation System and explain the function of each block.	L1	10M

UNIT-III

6.		Define sequential circuit. And explain about Flip flops, registers, and counters.	L4	10M
		OR		
7.	a)	What are BCD codes and what are the various BCD codes?	L3	4M
	b)	Perform the following Decimal addition to 8421 BCD code. i)46+56, ii)126+225	L3	6M

Q.P. Code: 23CS0501 **R23**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Regular Examinations Jan/Feb 2024
INTRODUCTION TO PROGRAMMING
(Common to all)

Time: 3 Hours Max. Marks: 70

PART-A
(Compulsory Question)

1. **Answer the following: (10 X 02 = 20 Marks)**

	a	Define an algorithm.	L1	2M
	b	Define with example any four operators in C.	L1	2M
	c	What is meant by control statement?	L1	2M
	d	Describe the syntax of for Loop.	L2	2M
	e	Define 1D array.	L1	2M
	f	Define String.	L1	2M
	g	Explain how to assign an address to pointer variable.	L2	2M
	h	Differentiate structure and union.	L4	2M
	i	What is meant by call-by-value?	L1	2M
	j	Define file.	L3	2M

PART-B
(Answer all the questions: 05 X 10 = 50 Marks)

UNIT-I

2.		Explain the basic organization of a computer, focusing on the roles of the Arithmetic Logic Unit (ALU), memory, input-output units, and the program counter.	L2	10M
		OR		
3.		Define constant. List and explain the different constants in C language.	L1	10M

UNIT-II

4.		Write the syntax and illustrate the following statements with example i) if Statement ii) if else Statement iii) else if ladder iv) Nested if statements v) Switch Case.	L3	10M
		OR		
5.	(a)	Discuss the different looping statements with syntax in C.	L3	5M
	(b)	Construct a C Program to Perform Fibonacci series using for loop.	L6	5M

UNIT-III

6.	(a)	List the different types of arrays.	L1	5M
	(b)	Explain the One-Dimensional array with example.	L2	5M
		OR		
7.	(a)	Differentiate Character and String with example.	L4	5M
	(b)	Develop a C program that implement strlen( ), strlwr( ) and strupr( ).	L3	5M

UNIT-IV

8.	(a)	Explain the concept of pointer to pointers with examples.	L2	5M
	(b)	Discuss the concept of void pointers with examples.	L2	5M
		OR		
9.	(a)	Define structure within a structure? Explain with an example.	L2	5M
	(b)	Describe about array of structures.	L2	5M

UNIT-V

10.	(a)	Distinguish between call by value and call by reference with an example program.	L4	5M
	(b)	How to use Array as Function argument? Explain with an example program.	L1	5M
		OR		
11		Summarize the following with examples. i)Read( ) ii) write( ) iii)append( )	L2	10M

Q.P. Code: 23CE0101 R23

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Regular Examinations Jan/Feb 2024
BASIC CIVIL & MECHANICAL ENGINEERING
(MECH, CSM, CAD & CIA)

Time: 3 Hours Max. Marks: 70

(Answer all the questions)
(Use Single Answer Booklet Only)

PART-A

1. **Answer all the Questions**
   a) What do you mean by reinforced concrete? L2 1M
   b) List out various sources of water? L2 1M
   c) What are the uses of contour mapping? L1 1M
   d) Enumerate different stages of Hydrological cycle. L2 1M
   e) How impurities in water are classified? L2 1M

UNIT-I

2. a) Describe briefly about Structural Engineering. L3 5M
   b) Discuss about Transportation Engineering. L3 5M

OR

3. Draw a neat sketch of Prismatic Compass and mention various parts of it. L3 10M

UNIT-II

4. The bearing of the sides of a closed traverse ABCD are given below. Find the included angle of the given traverse. L3 10M

Line	Fore Bearing	Back Bearing
AB	40°	220°
BC	70°	250°
CD	210°	30°
DA	280°	100°

OR

5. Draw a neat sketch of Prismatic Compass and mention various parts of it. L2 10M

UNIT-III

6. a) Write a short note on Hydrology. L2 5M
   b) What do you mean by Rainwater harvesting? and write its advantages L2 5M

OR

7. What are the various sources of water used in water supply schemes? L3 10M

PART-B

1. **Answer all the Questions**
   a) How do you classify the metals? L1 1M
   b) What are the factors on which machining depends? L1 1M
   c) List out the basic components of Robot L1 1M
   d) List out the functions of additive manufacturing L1 1M
   e) Define the nuclear fission process with an example L2 1M

UNIT-I

2. What is composite? How do you classify the composites? Explain in detail. L3 10M

OR

3. a) List out various important applications of smart materials. L2 5M
   b) Discuss about the important properties of Nonferrous metals. L3 5M

Q.P. Code: 23CE0101 R23

UNIT-II

4. Discuss the functions of various elements of CNC machine with a neat sketch. Also mention its advantages and disadvantages. L3 10M

OR

5. a) Distinguish between fire tube boiler and water tube boiler L3 5M
   b) Draw the P-V diagram of Otto Cycle and explain. L3 5M

UNIT-III

6. a) Describe in detail about Robot Anatomy L3 5M
   b) Explain various types of joints used in Robots L3 5M

OR

7. a) Differentiate between Belt drives, chain drives and gear drives L3 5M
   b) Robots are superior to human. Justify L3 5M

Q.P. Code: 23ME0302(a) R23

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Regular Examinations Jan/Feb 2024

ENGINEERING GRAPHICS

(CSE)

Time: 3 Hours Max. Marks: 70

(Answer all the questions: 05 X 14 = 70 Marks)

UNIT-I

1. Construct an ellipse, with distance of the focus from the directrix as 50 mm and eccentricity as 2/3. Also draw normal and tangent to the curve at a point 40 mm from the directrix — L3 14M

OR

2. Construct a cycloid, given the diameter of the generating circle as 40mm.Draw a tangent and normal to the curve at a point on it,35mm from the base line. — L4 14M

UNIT-II

3. Draw the projections of a straight line AB of 70 mm long, in the following positions: — L3 14M
   a) parallel to both HP and VP and 20 mm from each.
   b) Parallel to and 20 mm above the HP and on VP
   c) Parallel to and 30 mm in front of VP and on HP
   d) Perpendicular to HP, 30 mm in front of VP & one end 25 mm above HP
   e) Perpendicular to HP 30 mm in front of VP & one end on HP

OR

4. A square plane ABCD of side 30mm is parallel to HP and 20mm away from it. Draw the projections of the plane, when — L3 14M
   (i) two of its sides are parallel to VP and
   (ii) one of its side is inclined at 30^0 to VP.

UNIT-III

5. A cube of 40mm side is resting with a face on H.P such that — L3 14M
   i) vertical faces are equally inclined to V.P.
   ii) one of its vertical faces is inclined at 30^0 to V.P.
   Draw its projections.

OR

6. A Hexagonal pyramid of side of base 25mm and axis 60 mm long is resting on an edge of the base on HP. Its axis is parallel to HP and inclined at 45° to the VP. Draw its projections — L3 14M

UNIT-IV

7. A pentagonal pyramid with edge of base 25 mm and axis 65 mm long, its base is resting on HP. It is cut by a section plane, inclined at 60^0 to HP and perpendicular to VP it bisects the axis.Draw the projections and obtain the true shape of the section. — L4 14M

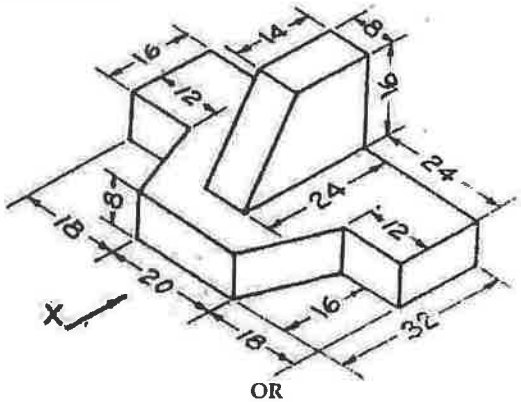
OR

8. A square prism of side of base 40 mm and axis 80 mm long, is resting on its base on HP such that, a rectangular face of it is parallel to VP. Draw the development of the prism. — L3 14M

Q.P. Code: 23ME0302(a) R23

UNIT-V

9. Draw three views of the blocks shown pictorially in figure according to first angle projection. — L3 14M



OR

10. Draw the isometric view of a pentagonal prism of base side 35 mm and axis 60mm. The prism rests on its base on the HP with an edge of the base parallel to the VP. — L4 14M

Q.P. Code: 23ME0302 (b) R23

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Regular Examinations Jan/Feb 2024
ENGINEERING GRAPHICS
(ECE & EEE)

Time: 3 Hours Max. Marks: 70

(Answer all the questions: 05 X 14 = 70 Marks)

UNIT-I

1. The vertex of a hyperbola is 60 mm from its focus. Draw the curve, if the eccentricity is 3/2. Draw a normal and a tangent at a point on the curve, 75 mm from the directrix. L3 14M

OR

2. a) Develop the involute of a regular hexagon of side 20 mm. Draw a tangent and normal to the curve at a distance of 100 mm from the centre of the hexagon. L3 8M
   b) i) Draw the involute of a square of side 25 mm ii) Draw the involute of an equilateral triangular of side 20 mm. L3 6M

UNIT-II

3. Draw the projections of a straight line AB of 70 mm long, in the following positions: L3 14M
   a) Inclined at 30⁰ to VP, in HP and one end on VP
   b) Inclined at 45 ⁰ to HP, one end 20 mm above HP and parallel to and 30 mm in front of VP
   c) Inclined at 60 ⁰ to VP, one end 20 mm in front of VP and parallel to and 25 mm above HP

OR

4. A regular hexagonal plane of 30 mm side has a corner on HP, and its surface is inclined at 45⁰ to HP. Draw the projections, when the diagonal through the corner, which is on HP makes 30⁰ with VP L4 14M

UNIT-III

5. A triangular prism of base side 30mm and axis 50mm long, is resting on H.P on one of its bases L3 14M
   i) Perpendicular to V.P
   ii) Inclined 30⁰ to V.P.
   Draw its projections.

OR

6. A cylinder of base diameter 50mm and axis 70 mm has a generator in the VP and inclined at 45⁰ to the HP. Draw its projections. L3 14M

UNIT-IV

7. A hexagonal prism of side of base 30 mm and length of axis 75 mm is resting on its base on HP. It is cut by a section plane inclined at 45⁰ to HP and passing through top corner. Draw the front and sectional top views of the solid and true shape of the section. L4 14M

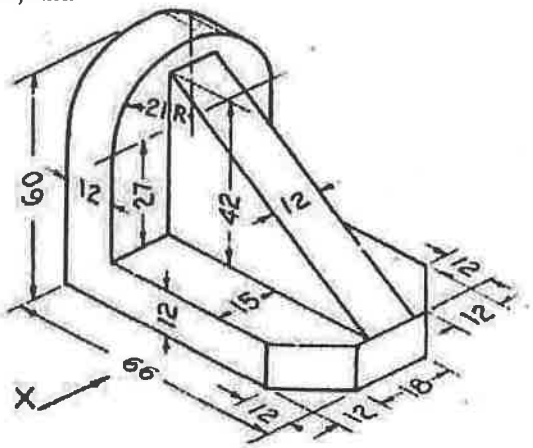
OR

8. A cone of base 50 mm diameter and height 65 mm rests with its base on HP. A section plane perpendicular to VP and inclined at 30⁰ to HP bisects the axis of the cone. Draw the development of the lateral surface of the truncated cone. L3 14M

Q.P. Code: 23ME0302 (b) R23

UNIT-V

9. Draw three views of the blocks shown pictorially in figure according to first angle projection L4 14M



OR

10. a) Draw the isometric view of a cylinder of base diameter 50mm and axis 60 mm the axis of the cylinder is perpendicular to the HP L3 8M
    b) Draw the isometric view of a circular lamina of diameter 50mm on all the three principal planes using four centre methods. L3 6M

Q.P. Code: 20CS0516 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

COMPILER DESIGN

(CSE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	a)	Define compiler.	L1	2M
	b)	Analyze the process of compilation while designing a compiler	L4	10M
		OR		
2.	a)	Describe Bootstrapping.	L2	8M
	b)	Explain the different applications of compiler technology	L2	4M

UNIT-II

3.		**Consider the grammar** **S→AB | ABad** **A→d** **E →b** **D→b | ε** **B→c** **Construct the predictive parse table and check whether the given grammar is LL(1) or not.**	L6	12M
		OR		
4.	a)	Discuss the types of errors.	L2	6M
	b)	Explain Error recovery in predictive parsing with an Example.	L2	6M

UNIT-III

5.	a)	Describe bottom up parsing	L1	4M
	b)	Differences between SLR, CLR, LALR parsers	L4	8M
		OR		
6.		**Design the LALR parser for the following Grammar** **S → AA A → aA A →b**	L6	12M

UNIT-IV

7.		**Produce quadruple, triples and indirect triples for following expression:** **(x + y) * (y + z) + (x + y + z)**	L6	12M
		OR		
8.	a)	Discuss about symbol table entries.	L2	6M
	b)	Describe the various operations on symbol table.	L2	6M

UNIT-V

9.		Explain the following i) Basic blocks ii) Flow Graphs	L3	12M
		OR		
10.	a)	**Create the DAG for following statement. a+b*c+d+b*c**	L6	6M
	b)	**Construct the DAG for the following basic blocks**	L6	6M

1. t1:=4*i
2. t2:=a[t1]
3. t3:=4*i
4. t4:=b[t3]
5. t5:=t2*t4
6. t6:=prod+t5
7. prod:=t6
8. t7:=i+1
9. i:=t7

if i<=20 goto 1

Q.P. Code: 20CS0903 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
AUTOMATA THEROY AND COMPILER DESIGN
(CSM)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	a)	Contrast Mealy machine and Moore machine.	L3	6M
	b)	Convert the following Mealy machine into its equivalent Moore machine.	L3	6M

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

OR

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

UNIT-II

3.	a)	State the formal of PDA.	L1	4M
	b)	Construct an equivalent PDA for the following CFG. S→aAB | bBA A→bS|a B→aS | b.	L6	8M

OR

4.	a)	State Pumping lemma for Context-free language	L1	6M
	b)	Show that L = {$a^n b^n c^n$, where n>=1} is not context free.	L3	6M

UNIT-III

5.	a)	Explain Left recursion and Left factoring.	L2	6M
	b)	Perform left factor for the grammar A→abB/aB/cdg/cdeB/cdfB	L3	6M

OR

6.	a)	Illustrate the rules to be followed in finding the FIRST and FOLLOW.	L5	6M
	b)	Find FIRST and FOLLOW for the following grammar? E→ E+T/T T→T*F/F F→(E)/id	L2	6M

UNIT-IV

7.		Evaluate the following terms i) Stack allocation ii) Static allocation iii) heap allocation	L3	12M

OR

8.	a)	Explain syntax directed definition with simple examples	L2	6M
	b)	Describe in detail the Translation scheme of SDD.	L2	6M

UNIT-V

9.		Produce quadruple, triples and indirect triples for following expression: (x + y) * (y + z) + (x + y + z)	L6	12M

OR

10.	a)	Define and Show Dead-code elimination with example.	L1	6M
	b)	List and explain the Issues in the design of a code generator	L2	6M

Q.P. Code: 20CS1303 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
MICROPROCESSOR & EMBEDDED SYSTEMS
(CIA)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Draw and explain the architecture of 8086 Microprocessor.	L3	12M
		OR		
2.	a)	Explain the memory organization of 8086 microprocessor.	L3	7M
	b)	With an example explain the Physical Address calculation for 8086 microprocessor.	L2	5M

UNIT-II

3.		Explain the various addressing modes supported by 8086 microprocessor with examples.	L3	12M
		OR		
4.	a)	Explain Arithmetic instructions of 8086 microprocessor with examples.	L2	6M
	b)	Explain the Data transfer instructions of the 8086 microprocessor with examples.	L2	6M

UNIT-III

5.	a)	List the features of 8051 microcontroller.	L5	4M
	b)	Explain about the timers and counters in 8051 microcontroller.	L5	8M
		OR		
6.	a)	Explain Jump and Call instructions of 8051 microcontroller with examples.	L5	6M
	b)	Explain Logical instructions of 8051 microcontroller with examples.	L2	6M

UNIT-IV

7.	a)	Define embedded system and discuss the applications of embedded systems.	L1	6M
	b)	Explain the role of following in embedded system. i) Oscillator ii) Real Time Clock	L2	6M
		OR		
8.	a)	Discuss the programming languages and tools for embedded design.	L2	8M
	b)	Distinguish between RISC and CISC.	L3	4M

UNIT-V

9.	a)	Explain about Linux commands.	L3	6M
	b)	Illustrate how to interface a servo motor with raspberry pi and write a python program to control the speed of servo motor?	L3	6M
		OR		
10.	a)	Explain about camera interface to Raspberry pi.	L3	6M
	b)	Illustrate how to interface a LED to raspberry pi and write a python program to control the brightness of LED.	L3	6M

Q.P. Code: 20CS1101 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
INTRODUCTION TO DATA SCIENCE
(CAD)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	a)	Define Data Science and discuss benefits and uses of data science?	L1	6M
	b)	How will you creating research goals in a project charter?	L3	6M
		OR		
2.	a)	What are various steps involved in integrating phase?	L1	6M
	b)	What are the ways analyzed the data and built a well-performing model?	L2	6M

UNIT-II

3.	a)	Differentiate Null Hypotheses and Alternative Hypotheses?	L4	6M
	b)	Examine the application property of Wilcoxon Rank-Sum test?	L2	6M
		OR		
4.	a)	List and discuss the four measures of significance of Association rules?	L2	6M
	b)	Give the applications of Association rules?	L1	6M

UNIT-III

5.	a)	Which two basic measures does the entropy methods select the most informative attribute?	L1	6M
	b)	Explain the Linear Regression with its model description?	L2	6M
		OR		
6.	a)	Compare the C4.5 and CART algorithm of decision tree?	L4	6M
	b)	Give the two approaches that help avoid over fitting in decision tree learning?	L2	6M

UNIT-IV

7.		What is clustering? Illustrate the method to find 'k' clusters from a collection of M objects with 'n' attributes?	L3	12M
		OR		
8.	a)	Explain any one case study for time series analysis?	L2	6M
	b)	What is forecasting in association with time series. Explain?	L1	6M

UNIT-V

9.	a)	Explain how categorizing documents by topics is done?	L2	6M
	b)	Interpret the procedure used in data science to gain insights into customer opinions?	L3	6M
		OR		
10.	a)	Sketch the flow diagram of Text analysis process?	L5	6M
	b)	Illustrate in detail the steps involved in the process of Text Analysis done by organization?	L3	6M

Q.P. Code: 20CE0119 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
STRUCTURAL DESIGN
(CIVIL)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	a)	Draw the stress-strain curve for concrete and explain.	L2	6M
	b)	A singly reinforced rectangular beam of width 230 mm and 535 mm effective depth is subjected to a bending moment of 90 kNm at working loads. Find the steel area required? The materials used are M20 grade concrete and Fe 415 grade steel.	L3	6M
		OR		
2.		Determine the moment of resistance of beam having the following data:b = 350 mm; d = 900 mm; Effective cover = 50 mm; Tension reinforcement = 5-20 mm HYSD bars of Fe415; Compression reinforcement = 2-20 mm HYSD bars of Fe415; Grade of concrete = M20?	L3	12M

UNIT-II

3.		A reinforced concrete beam of rectangular section has a width of 250 mm and an effective depth of 500 mm. The beam is reinforced with 4 bars of 25 mm diameter on the tension side. Two of the tension bars are bent up at 45° near the support section. In addition, the beam is provided with two legged stirrups of 8 mm diameter at 150 mm centers near the support. If fck= 25 N/mm^2 and fy = 415 N/mm^2 , estimate the ultimate shear strength of the support section?	L3	12M
		OR		
4.		Design a two-way slab for a room of size 4 m x 5 m with discontinuous and simply supported edges on all the sides with corners prevented from lifting to support a live load of 4 kN/m^2 and weight of weathering course over the slab is 0.6 kN/m^2 .Adopt M20 grade concrete and Fe415 grade steel.	L3	12M

UNIT-III

5.		Design the reinforcement in a column of size 400 mm × 600 mm, subjected to an axial working load of 2000 kN. The column has an unsupported length of 3 m and is braced against side way in both directions. Use M20 grade concrete and Fe415 steel.	L3	12M
		OR		
6.		Design a reinforced concrete footing of uniform thickness for a reinforced concrete column of 400 mm x 400 mm size carrying an axial load of 1200 kN. Use M20 grade concrete and Fe415 steel. The safe bearing capacity of soil is 220 kN/m^2.	L3	12M

UNIT-IV

7.		Design a lap joint between two plates each of width 120 mm and the thickness of one plate is 16 mm and the other is 12 mm. The joint has to transfer a design load of 160 kN. The plates are of Fe410 grade. Use bearing type bolts.	L3	12M
		OR		
8.		Design a double angle tension member connected on each side of a 10 mm thick gusset plate to carry an axial factored load of 350 k N. Use 20 mm black bolts Assume shop Connection.	L3	12M

UNIT-V

9.		Design a beam 4m effective length subjected to 50 kN/m UDL (Including self-weight) , the flanges are embedded in slab and simply supported at both the ends.	L3	12M
		OR		
10.		Design a single angle strut connected to the gusset plate to carry 180 kN factored load. The length of the strut between center to center connections is 3m.	L3	12M

Q.P. Code: 20EE0214 R20

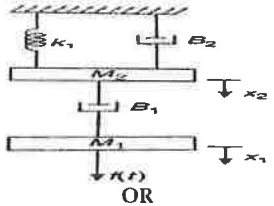
SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
CONTROL SYSTEMS
(EEE)

Time: 3 Hours Max. Marks: 60

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

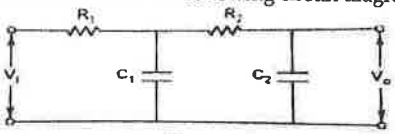
UNIT-I

1. Obtain i) F-V and ii) F-I analogous circuit of the following mechanical system. L3 12M



OR

2. a) Obtain the transfer function of the following circuit diagram. L3 6M



b) Define the Open loop and Closed loop control systems with examples. L2 6M

UNIT-II

3. A second order system is represented by the transfer function, $\frac{Y(s)}{U(s)}=\frac{1}{Js^2+Bs+K}$. A step input of 10Nm is applied to system and results are, L3 12M

i) $\%\ M_p = 6\%$

ii) $t_p = 1\text{sec}$

iii) The steady state value of output is 0.5 radians.

Find the values of J,B and K.

OR

4. a) What is the Transient and steady state response of first and second order Systems. L2 6M

b) What is the characteristic equation? List the significance of characteristic equation. L2 6M

UNIT-III

5. Plot the root locus of the system with OLTF $G(s)H(s)=\frac{K(s+0.5+j)(s+0.5-j)}{(s+1)(s+2)}$, Show that part of root locus of system is a circle. L5 12M

OR

6. a) Examine the stability of the given equations using Routh's stability criterion: $s^3+6s^2+11s+6=0$ L5 6M

b) State and explain RH criterion of stability. What are its limitations? L2 6M

Q.P. Code: 20EE0214 R20

UNIT-IV

7. Sketch the Nyquist plot and determine the stability of the following open loop transfer function of unity feedback control system. L5 12M
$G(s)H(s)=\frac{K(s+3)}{s^2(s+1)}$

OR

8. a) List out the frequency domain specifications and derive the expressions for resonant peak. L2 6M

b) Define: L1 6M

i) Resonant peak
ii) Resonant frequency
iii) Bandwidth

UNIT-V

9. Find a state model for the system whose Transfer function is given by L3 12M
$G(S)H(S)=\frac{(7s^2+12S+8)}{(s^3+12s^2+11S+9)}$

OR

10. a) Define state, state variable, state equation. L1 6M

b) Find state variable representation of an armature controlled D.C.motor. L2 6M

Q.P. Code: 20EC0415 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

(ECE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Determine the Electric flux density due to uniformly charged Sphere using Gauss law.	L3	12M

OR

2.	a)	A point charge Q= 30 nC is located at the origin in Cartesian co-ordinates. Find the electric flux density **D** at (1,3,-4).	L3	6M
	b)	Apply Gauss Law to evaluate the electric flux density at a point P due to the point charge located at the origin.	L2	6M

UNIT-II

3.		A Current Distribution gives rise to the vector potential $\mathbf{A}= X^2Y\mathbf{a}_x + Y^2X\mathbf{a}_y + XYZ\mathbf{a}_z$ web/m. Calculate **B**.	L3	12M

OR

4.	a)	Given Magnetic Vector Potential $A= -\rho/4\ a_z$ wb/m, Calculate the total magnetic flux crossing the $\Phi=\pi/2, 1\leq\rho\leq2m1, 0\leq z\leq5m$.	L2	6M
	b)	Determine the Magnetic Field Intensity due to a infinite sheet current.	L2	6M

UNIT-III

5.	a)	Formulate the expressions for inconsistency of Ampere's law.	L5	8M
	b)	Deduce the Expression for Moving loop in Time varying Fields.	L5	4M

OR

6.	a)	Prove that one of the Maxwell's equations is $\nabla\times H = J_d + J$.	L5	8M
	b)	Define Faraday's law and Explain Faraday's laws in Electromagnetic induction.	L2	4M

UNIT-IV

7.		A plane wave propagating through medium with $\varepsilon_r = 8, \mu_r = 2$ has the electric field intensity $E = 0.5\ e^{-j\pi3}\sin(10^8t - \beta z)\ \hat{a}_x$ V/m. Determine wave velocity, wave impedance and magnetic field intensity.	L1	12M

OR

8.	a)	Derive the expression for intrinsic impendence and propagation constant in a good conductor.	L2	6M
	b)	Evaluate the wave equation in lossy dielectric medium for sinusoidal time variations.	L3	6M

UNIT-V

9.		Deduce the equation for voltage and current at any point in a transmission line.	L3	12M

OR

10.	a)	A Certain transmission line 2m long operating at $\omega = 10^6$ rad/s has α=8bd/m,β=1 rad/m, and $Z_0 = 60+j40\Omega$. If the line is connected to a source of $10\ \angle0^0$ V, $Z_g = 40\ \Omega$ terminated by a load of $20+j50\Omega$, determine the input impedance.	L3	6M
	b)	Discuss about transient on transmission line.	L3	6M

Q.P. Code: 20ME0314 R20

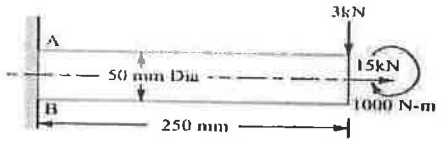
SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
DESIGN OF MACHINE ELEMENTS - I
(MECH)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1. A shaft, as shown in Fig. is subjected to a bending load of 3 kN, pure torque of 1000 N-m and an axial pulling force of 15 kN. Calculate the stresses at A and B. L3 12M



OR

2. a) List out the general design consideration to be followed while designing a machine element L3 6M
   b) Identify various manufacturing consideration to be followed in designing a machine element. L2 6M

UNIT-II

3. Cylindrical shaft made of steel of yield strength 700 MPa is subjected to static loads consisting of bending moment 10 kN-m and a torsional moment 30 kN-m. Determine the diameter of the shaft using two different theories of failure, and assuming a factor of safety of 2. Take E = 210 GPa and poisson's ratio = 0.25. L3 12M

OR

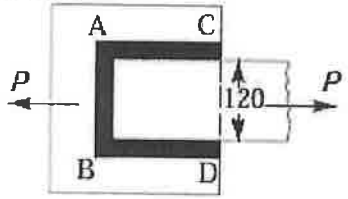
4. a) What is meant by factor of safety? Explain how it can be used in design applications. L2 6M
   b) Describe the following theories of failures in detail (i) Rankine's theory (ii) Guest's or Tresca's theory (iii) Saint Venant theory. L2 6M

UNIT-III

5. a) List out the important terms used in screw threads with a neat sketch. L5 6M
   b) Describe the initial stresses induced in screw fasteners due to screwing up forces. L5 6M

OR

6. Determine the length of the weld run for a plate of size 120 mm wide and 15 mm thick to be welded to another plate by means of 1. A single transverse weld; and 2. Double parallel fillet welds when the joint is subjected to variable loads. L5 12M



Q.P. Code: 20ME0314 R20

UNIT-IV

7. A shaft is supported by two bearings placed 1 m apart. A 600 mm diameter pulley is mounted at a distance of 300 mm to the right of left hand bearing and this drives a pulley directly below it with the help of belt having maximum tension of 2.25 kN. Another pulley 400 mm diameter is placed 200 mm to the left of right hand bearing and is driven with the help of electric motor and belt, which is placed horizontally to the right. The angle of contact for both the pulleys is 180° and $\mu = 0.24$. Determine the suitable diameter for a solid shaft, allowing working stress of 63 MPa in tension and 42 MPa in shear for the material of shaft. Assume that the torque on one pulley is equal to that on the other pulley. L4 12M

OR

8. a) How the shaft is designed when it is subjected to twisting moment only? L2 6M
   b) A shaft made of mild steel is required to transmit 100 kW at 300 r.p.m. The supported length of the shaft is 3 metres. It carries two pulleys each weighing 1500 N supported at a distance of 1 metre from the ends respectively. Assuming the safe value of stress, determine the diameter of the shaft L3 6M

UNIT-V

9. Design and draw a clamp coupling to transmit 30 kW at 100 r.p.m. The allowable shear stress for the shaft and key is 40 MPa and the number of bolts connecting the two halves are six. The permissible tensile stress for the bolts is 70 MPa. The coefficient of friction between the muff and the shaft surface may be taken as 0.3. L3 12M

OR

10. a) What is a key? State its function with neat sketch. L3 6M
    b) Design the rectangular key for a shaft of 50 mm diameter. The shearing and crushing stresses for the key material are 42 MPa and 70 MPa. L3 6M

Q.P. Code: 20CS0517 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

DATA WAREHOUSING AND DATA MINING

(CSE & CAD)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Classify the Data Mining Functionalities with example.	L4	12M
		OR		
2.	a)	Define Data mining? What are all points to be discussed to motivate data mining?	L1	6M
	b)	Explain Data mining as a step in the process of knowledge discovery.	L2	6M

UNIT-II

3.		Analyze the OLAP operation in multidimensional data.	L4	12M
		OR		
4.	a)	Discuss in detail about Data Warehouse Implementation.	L2	6M
	b)	Explain in detail about the key feature of Data Warehousing.	L2	6M

UNIT-III

5.	a)	Discuss about Basic Concepts of Frequent Item set mining.	L2	6M
	b)	What are the advantages of FP-Growth algorithm?	L1	6M
		OR		
6.		Explain about the Apriori algorithm for finding frequent item sets with an example.	L3	12M

TID	List of item_IDs
T100	I1, I2, I5
T200	I2, I4
T300	I2, I3
T400	I1, I2, I4
T500	I1, I3
T600	I2, I3
T700	I1, I3
T800	I1, I2, I3, I5
T900	I1, I2, I3

Generate the list of frequent item-set ordered by their corresponding Suffixes, where the minimum support count is 2 and Minimum Confidence
is 60%.

UNIT-IV

7.		Summarize about attribute selection measures.	L2	12M
		OR		
8.	a)	Distinguish between supervised and unsupervised learning.	L4	6M
	b)	What are the Issues regarding Classification and Prediction? Explain.	L1	6M

UNIT-V

9.		Compose K-Means and K-Medoids partitioning methods in detail.	L6	12M
		OR		
10.	a)	Compare Agglomerative and Divisive hierarchical clustering.	L5	6M
	b)	What are the basic approaches for generating an agglomerative hierarchical clustering? Explain the algorithm.	L2	6M

Q.P. Code: 20CS0904 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

INTRODUCTION TO MACHINE LEARNING

(CSM)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Explain about Supervised Learning techniques.	L2	12M
		OR		
2.	a)	What is the role of pre-processing of data in machine learning? Why it is needed?	L1	6M
	b)	Analyze Reinforcement Learning with neat diagram.	L4	6M

UNIT-II

3.		Identify Linear Regression and its types.	L1	12M
		OR		
4.	a)	Express in detail about polynomial regression technique	L2	6M
	b)	Differentiate between classification and regression.	L2	6M

UNIT-III

5.	a)	State and explain discriminant functions	L1	6M
	b)	Differentiate between linear and nonlinear discriminant functions	L2	6M
		OR		
6.	a)	Describe Bayesian decision classifier.	L2	6M
	b)	Explain linear discriminant analysis	L2	6M

UNIT-IV

7.		Express various model selection procedures?	L6	12M
		OR		
8.	a)	Examine about bias and variance?	L3	6M
	b)	What is bias/variance dilemma? Explain in detail?	L1	6M

UNIT-V

9.		Explain in detail about a) Agglomerative Clustering b) Hierarchical Clustering	L2	12M
		OR		
10.	a)	Explain maximum likelihood estimation in detail?	L3	6M
	b)	Discuss the applications of multivariate normal distribution?	L2	6M

Q.P. Code: 20CS1304 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb - 2024
IOT ARCHITECTURE AND ITS PROTOCOLS
(CIA)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1	Explain design principles of IoT architecture.	L2	12M
	OR		
2	Explain about Everything as service (XaaS)	L2	12M

UNIT-II

3	Discuss various views of IoT Reference architecture.	L2	12M
	OR		
4	Describe Relationship between Reference model and Reference architecture and architecture Patttern	L1	12M

UNIT-III

5	Explain IEEE 802.11 architecture.	L2	12M
	OR		
6	How Dash7 protocol will Work?	L2	12M

UNIT-IV

7	Differentiate TCP and UDP.	L2	12M
	OR		
8	What is the working process of Broker in MQTT protocol	L1	12M

UNIT-V

9	Discuss about the Reference architecture for managing M2M Device Gateway	L4	12M
	OR		
10	Differentiate COAP and MQTT	L2	12M

Q.P. Code: 20CE0120 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

TRANSPORTATION ENGINEERING

(CIVIL)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		While aligning a highway in a built up area, it was necessary to provide a horizontalcurve of radius 250 m for a design speed 55 km/hr, length of wheel base-4m andpavement width 10m. Assume rate of introduction of super elevation as 1 in 100 and super elevation is provided by rotating about centre line. Design super elevation, extra widening of pavement and length of transition curve.	L3	12M
		OR		
2.	a)	Explain any four highway cross-sectional elements?	L1	6M
	b)	Derive an expression for extra widening in a horizontal curve?	L1	6M

UNIT-II

3.		Explain the significance of traffic studies. Briefly explain any four types of trafficStudies	L1	12M
		OR		
4.	a)	Explain briefly about traffic control devices.	L1	4M
	b)	Discuss about various Engineering measures that can help in reducing time accidentrate.	L2	8M

UNIT-III

5.	a)	Differentiate between flexible pavements and rigid pavements.	L1	6M
	b)	What are the functions of tie bars and dowel bars in rigid pavements? What is the designprinciple?	L1	6M
		OR		
6.	a)	Draw a sketch of flexible pavement cross section and show the component parts. Enumerate the Functions and importance of each component of the pavement.	L5	8M
	b)	What are warping stresses? List out the stresses in rigid pavement.	L1	4M

UNIT-IV

7.		Giving a typical cross section of a permanent way on an embankment, indicate various components. Also describe the functions of various components of a Permanent way.	L2	12M
		OR		
8.	a)	What are the different types of rails used? Explain the concept of Adzing ofsleepers and Discuss about methods of rectifying creep?	L2	6M
	b)	Discuss briefly about the functions of different components of permanent way.	L2	6M

UNIT-V

9.		Discuss briefly about stations with different types.	L1	12M
		OR		
10.	a)	Compute the maximum permissible speed for the following data on a curve ofhigh speed B.G for the following data. Degree of curve = 1.2^0, Amount of super elevation = 8 cm, Length of transition curve = 150 m, Maximum sanctioned speedlikely to be 135 kmph.	L3	6M
	b)	What is grade compensation in railway track design? Why is it necessary toprovide grade compensation?	L1	6M

Q.P. Code: **20EE0215** R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
ELECTRICAL MACHINCES-III
(EEE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		A 3-phase, 50 Hz, 16 pole star connected alternator has stator winding with 144 slots with 10 conductors per slot. The flux per pole is 0.04 wb and is distributed sinusoidally. The speed is 375 rpm. Find the frequency, phase EMF, and line EMF. The coil span is 120 degree electrical.	L3	12M
		OR		
2.	a)	Compare the difference between salient pole and non-salient rotor.	L3	6M
	b)	Explain the principle of operation of a synchronous generator.	L2	6M

UNIT-II

3.		The open circuit and short circuit test is conducted on 3-phase star connected 866V, 100 kV alternator. The O.C test results are: The field current of 1A produces a short circuit current of 25A. The armature resistance per phase is 0.15 Ω. Calculate its full load regulation at 0.8 lagging power factor condition.	L3	12M

I_f(A)	1	2	3	4	5	6
V_{oc}(V)	173	310	485	605	728	790

OR

4.	a)	State and explain the voltage equation of an alternator	L2	6M
	b)	Define the voltage regulation of an alternator. Explain the various factors, which may affect the regulation of an alternator.	L2	6M

UNIT-III

5.	a)	What is infinite bus bar? Explain synchronization of alternator with infinite bus bar.	L5	6M
	b)	Explain necessity of parallel operation of alternators	L5	6M
		OR		
6.		a) List out the conditions for parallel operation of alternators. b) What are the methods used for synchronization of alternators. c) Write the formulae for power developed per phase of an alternator connected to an infinite bus bar. d) Draw the power angle characteristics of synchronous machine. e) Define synchronizing current.	L5	12M

UNIT-IV

7.		Explain the laboratory setup to obtain V and inverted V curves	L1	12M
		OR		
8.	a)	Explain the condition for maximum power and the value of maximum power for synchronous motors.	L2	8M
	b)	Explain the power flow diagram in a synchronous motor.	L3	4M

UNIT-V

9.		Explain the constant excitation circles and constant power circles for a synchronous motor.	L3	12M
		OR		
10.	a)	Draw and explain the phasor diagram of a synchronous motor operating at lagging and leading power factor	L3	6M
	b)	Discuss the performance characteristics of a synchronous induction motor.	L3	6M

Q.P. Code: 20EC0416 **R20**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

MICROPROCESSORS AND MICROCONTROLLERS

(ECE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Draw a block diagram of Microprocessor based system and explain the functions of each component: Microprocessor, Memory and I/O and their line communication.	L4	12M

OR

2.	a)	Illustrate the microcomputer system with example.	L3	6M
	b)	Draw the block diagram of output section of Microcomputer. Describe the role of tristate bus driver, decoder and latch.	L4	6M

UNIT-II

3.	a)	Draw the pin diagram of the 8085 microprocessor and categorize the pins based on function.	L4	8M
	b)	Outline the role of the following pins in the8085 microprocessor. i) RESET OUT ii) ALE iii) HOLD & HLDA iv) TRAP	L2	4M

OR

4.	a)	Explain the Arithmetic instructions. instructions of the 8085 microprocessor.	L2	6M
	b)	Explain the branch control instructions of the 8085 microprocessor.	L2	6M

UNIT-III

5.	a)	Draw the internal architecture of 8051 microcontroller and explain the function of each block present in it.	L2	8M
	b)	List the features of 8051 microcontroller.	L1	4M

OR

6.	a)	Explain the different types of interrupts in the 8051 microcontroller.	L2	6M
	b)	Describe the vector address of interrupts in 8051 µC.	L2	6M

UNIT-IV

7.	a)	Discuss RR, RL, RLC, RRC and swap instructions with suitable example.	L2	6M
	b)	Discuss the logical operations Instructions of 8051 microcontroller with an example.	L2	6M

OR

8.	a)	List various arithmetic operations performed in 8051 microcontroller.	L1	6M
	b)	Explain any three arithmetic operations Instructions of 8051 microcontroller with an example.	L2	6M

UNIT-V

9.	a)	List out types of 16 key layouts and draw the diagram of the lead per key keyboard configuration.	L4	6M
	b)	Design the x-y matrix keyboard and coded key board.	L6	6M

OR

10.	a)	Illustrate the multiple source interrupt circuit used in Lopri and Hipri program.	L3	6M
	b)	Describe and design the hardware circuits for multiple interrupts.	L1	6M

Q.P. Code: 20ME0315 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
HEAT AND MASS TRANSFER
(ME)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Derive the general heat conduction equation in Cartesian coordinate.	L3	12M
		OR		
2.	a)	Distinguish between conduction, convection and radiation modes of heat transfer.	L3	6M
	b)	A plane wall is 150 mm thick and its wall area is 4.5 m2. If its conductivity is 9.35 W/m^{0}C and surface temperature are steady at 150^0 C and 45^{0}C, determine i).Heat transfer across the plane wall, ii).Temperature gradient in the flow direction.	L2	6M

UNIT-II

3.		An exterior wall of a house may be approximated by a 0.1 m layer of common brick (K= 0.7 w/m^{0}C) followed by a 0.04 m layer of gypsum plaster (K= 0.48 w/m^{0}C).What thickness of loosely packed rock wool insulation (K=0.065 w/m^{0}C) should be added to reduce the heat loss through the wall by 80 percent.	L3	12M
		OR		
4.	a)	Derive an expression for heat conduction through a composite wall.	L2	6M
	b)	A reactor's wall, 320 mm thick, is made up of an inner layer of fire brick (k = 0.84W/m^{0}C) covered with a layer of insulation (k = 0.16 W/m^{0}C). The reactor operates at a temperature of 1325^{0}C and the ambient temperature is 25^{0}C. Determine the thickness of fire brick and insulation which gives minimum heat loss. Take t2=1200^{0}C.	L2	6M

UNIT-III

5.	a)	Derive the expression for Reynolds number and how flows are determined by Reynolds number.	L5	6M
	b)	Calculate the heat transfer from a 60 W in candescent bulb at 115^{0}C to ambient air at 25^{0}C. Assuming the bulb as a sphere of 50 mm diameter. Also, find the percentage of power lost by free convection. The correlation is given by: Nu = 0.60 (Gr.Pr)$^{1/4}$.	L5	6M
		OR		
6.	a)	What is the physical significance of the Nusselt number? How is it defined?	L5	6M
	b)	A horizontal plate measuring 1.5 m x 1.1 m and at 215^{0}C, taking upward is placed in still air at 25^{0}C. Calculate the heat loss by natural convection. The convective film coefficient for free convection is given by the following empirical relation h = 3.05(Tf)$^{1/4}$ W/m2^{0}C. where Tf is the mean film temperature in degree Kelvin.	L2	6M

UNIT-IV

7.		The effective temperature of the body having an area of 0.12 m2 is 527^{0}C. Calculate the following i) The total rate of energy emission, ii) The wave length of maximum monochromatic emissive power.	L1	12M
		OR		
8.	a)	What are the applications of boiling and condensation process?	L2	6M
	b)	Differentiate between the mechanism of film wise and drop wise condensation.	L3	6M

UNIT-V

9.		Which of the arrangement of heat exchangers is better, (i) parallel flow, (ii) Counter flow? Explain the reasons.	L3	12M
		OR		
10.	a)	Elucidate the correlation for mass transfer.	L3	6M
	b)	What is Mass transfer coefficient? Explain it briefly.	L3	6M

Q.P. Code: 20CS0518 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B. Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

SOFTWARE ENGINEERING

(CSE, CSM, CAD & CIA)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		What is Agile Process? How Extreme Programming (XP) is an effective agile Model? Explain with neat sketch.	L2	12M
		OR		
2.	a)	How umbrella activities help in solving a software problem? Explain.	L2	6M
	b)	Distinguish between Application Software and System Software with examples.	L4	6M

UNIT-II

3.		Define Requirement Engineering. Examine the steps involved in RE Process.	L4	12M
		OR		
4.	a)	Why Requirement Negotiation is important? Discuss in detail.	L4	6M
	b)	What kind of questions were addressed by Requirement team while validating the requirement?	L1	6M

UNIT-III

5.		Express the various types of Architectural styles briefly.	L6	12M
		OR		
6.	a)	What is the Design Process? Discuss software Quality guidelines and attributes.	L2	6M
	b)	Explain common characteristics in the evolution of software design.	L2	6M

UNIT-IV

7.		Give detailed notes on Architecture Design.	L2	12M
		OR		
8.	a)	Dissect in brief about the various steps of Navigation Design.	L4	6M
	b)	Examine the elements of component level design.	L3	6M

UNIT-V

9.		Explain about the importance of test strategies in conventional software.	L2	12M
		OR		
10.	a)	Discuss the process of Art of Debugging.	L2	6M
	b)	Difference between Alpha and Beta testing?	L4	6M

Q.P. Code: 20CE0121 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
ESTIMATION, COSTING AND VALUATION
(CIVIL)

Time: 3 Hours Max. Marks: 60

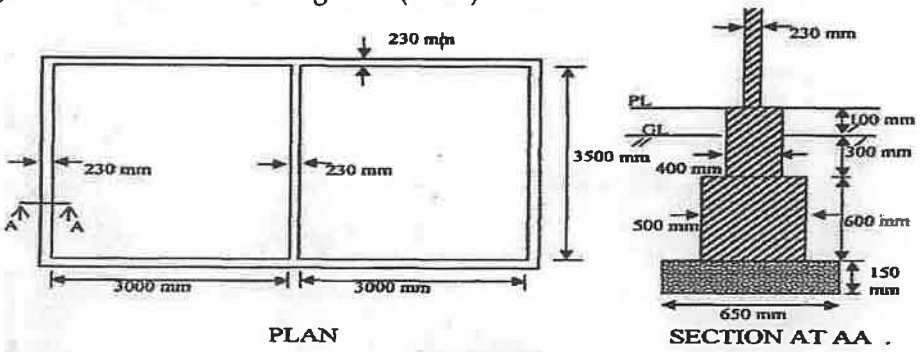
Answer one question from each unit (**5 x 12 = 60 Marks**)

UNIT-I

1. A person constructs a building of a plinth area equal to 190 sq.m. on a plot of land in a certain locality at a rate of Rs. 28,50,000/-. The height of the building from ground level to the top of roof is 3.10 m and parapet wall of height equal to 95 cm is constructed on the terrace. Determine the cost of a similar building of a plinth area equal to 160 sq.m. is to be constructed in the same locality by plinth area rate and volume rate method. L2 12M

OR

2. Estimate the following items for the plan and section given in Fig. 1 Use long wall and short wall method. L3 12M
(a) Earthwork for excavation
(b) I class brickwork for sub structure
(c) Inside plastering in CM (1 : 5) with 12 mm thickness.
(d) Cement concrete flooring in cc (1:1:2) with 20 mm thick.



PLAN SECTION AT AA

UNIT-II

3. Calculate the quantity of earth work by using Mid Sectional Area Method, Mean Sectional Area Method and Prismoidal Formula Method for 550 metre length for a portion of a road in an uniform ground heights of banks at the two ends being 1.50 m and 2.10 m. The formation width is 12 metre and side slopes 2:1(Horizontal: Vertical). Assume that there is no transverse slope. L1 12M

OR

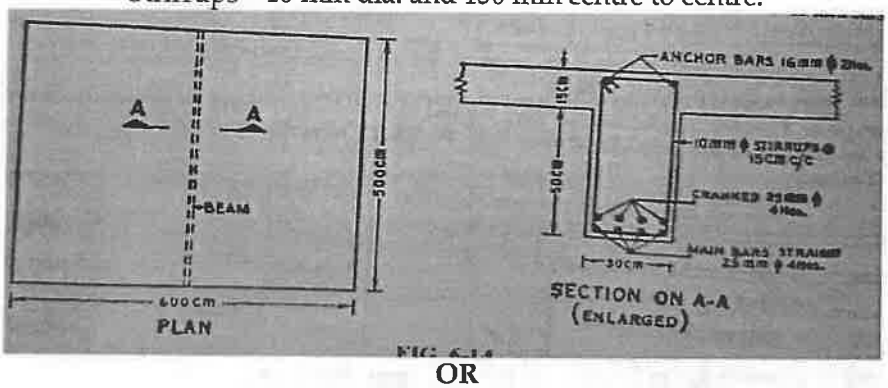
4. Reduced level (R.L.) of ground along the centre line of a proposed road from chainage 10 to chainage 20 are given below. The formation level at the 10th chainage is 107 and road is in downward gradient of 1 in 150 up to the chainage 14 and then the gradient changes to 1 in 100 downward. Formation width of road is 10 m and side slopes of banking are 2:1 (H:V). Length of the chain is 30 m. Prepare an estimate of earth at the rate of Rs.275/-Per cu.m. L2 12M

Chainage	RL of ground (m)
10	105.00
11	105.60
12	105.44
13	105.90
14	105.42
15	104.30
16	105.00
17	104.10
18	104.62
19	104.00
20	103.30

UNIT-III

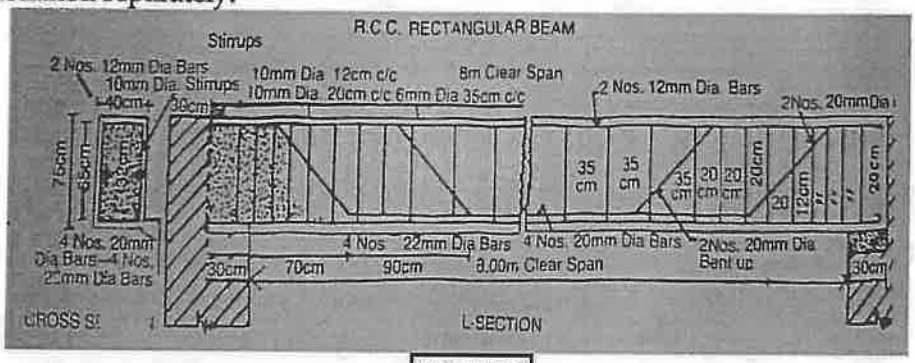
5. A room 600 cm long x 500 cm wide has a flat roof. There is one T-beam in the centre (cross section below the slab 30 cm x 50 cm) and the slab is 15 cm thick. Estimate the quantity of steel bars required for reinforcement (for the T-beam only) from the data given below :- L4 12M

Top Bars: 2 nos. 16mm dia
Bottom Bars – 4 nos. 25 mm
Cranked Bars – 4 nos. 25 mm
Strirrups – 10 mm dia. and 150 mm centre to centre.



OR

6. Prepare a detailed estimate of a RCC beam of 8 m clear span and 75 cm x 40 cm in section from the given drawings. Steel in detail and RCC work shall be calculated separately. L4 12M



UNIT-IV

7. Calculate the required materials for cement concrete and cement mortars for different proportions including bulkages and shrinkages for 100 cum. L1 12M

OR

8. Calculate the rate analysis for Granolithic cement concrete flooring in CC (1:1:3) , with 25 mm thick and vetrified tile flooring of size 60 cm x 60 cm over cement mortar bed with 20 mm thick. L2 12M

UNIT-V

9. What are different specifications for first class brick work? L3 12M

OR

10. A three-storied building is standing on a plot of land measuring 800 sq.m. The plinth area of each storey is 400 sq.m. The building is of RCC framed structure and the future life may be taken as 70 years. The building fetches a gross rent of Rs.1500.00 per month. Work out the capitalized value of the property on the basis of 6% net yield. For sinking fund 3% compound interest may be assumed. Cost of land may be taken Rs.40.00 per sq m. Other data as required may be assumed suitably. L3 12M

Q.P. Code: 20EE0216 **R20**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
ELECTRICAL MEASUREMENTS AND INSTRUMENTATION
(EEE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	a)	Illustrate the construction and working of permanent magnet moving coil instruments.	L3	8M
	b)	List the advantages and disadvantages of PMMC type instruments.	L1	4M
		OR		
2.	a)	A moving coil instrument gives a full -scale deflection of 10mA when the potential across its terminals is 100mV. Calculate shunt resistance for a full - scale deflection corresponding to 100 A.	L3	6M
	b)	Derive an expression for the Deflecting torque in MI type instruments.	L3	6M

UNIT-II

3.	a)	Draw the circuit diagram of a Wheatstone bridge and derive the condition for balance.	L3	8M
	b)	List the advantages and disadvantages of Maxwell"s Bridge.	L1	4M
		OR		
4.		Explain the construction and working of Anderson Bridge with suitable diagrams.	L2	12M

UNIT-III

5.	a)	Explain the constructional details of electro dynamometer type wattmeter with a neat sketch.	L2	6M
	b)	A 5 A, 110 V electrodynamic type wattmeter has a scale having 110 divisions. Its pressure coil is fed by a voltage of [110 $\sqrt{2}$ cos314) + $\sqrt{2}$sin(942t) V and its current coil carries a current of [5$\sqrt{}$ 2cos(314t + 60) + 2$\sqrt{}$ 2sin (628t + 90) + $\sqrt{2}$cos(642t + 90)] A. Find the needle movement from zero position.	L3	6M
		OR		
6.	a)	Explain with a neat sketch the construction and working of a Three phase energy meter.	L2	6M
	b)	Explain the working of 2 element energy meter with a neat diagram.	L2	6M

UNIT-IV

7.		Draw the phasor diagram of PT. Derive the expression for its transformation ratio and phase angle errors.	L3	12M
		OR		
8.	a)	Describe the construction and working of LVDT with a neat schematic diagram.	L2	6M
	b)	Describe the working principle of thermocouples.	L2	6M

UNIT-V

9.		Derive the equation of motion of balastic galvanometer.	L3	12M
		OR		
10.	a)	Draw a neat figure and explain the working of a C R O.	L2	6M
	b)	Analyze the Lissajous patterns.	L4	6M

Q.P. Code: 20EC0417 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
DIGITAL SIGNAL PROCESSING
(ECE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Compute 8-point DFT of the sequence (n) = {1,2,3,4,4,3,2,1} using Radix-2DIT-FFT Algorithm.	L3	12M

OR

2.	a)	List the properties of DFT.	L1	2M
	b)	State and Prove any Four properties of DFT.	L3	10M

UNIT-II

3.		Design a digital Butterworth IIR filter satisfying the following constraints. Let T= 1s, apply Impulse Invariant Transformation. $0.8 \leq \lvert H(w)\rvert \leq 1 \quad ; 0 \leq w \leq 0.2\pi$ $\lvert H(w)\rvert \leq 0.2 \quad ; 0.32\pi \leq w \leq \pi$	L3	12M

OR

4.	a)	Explain the frequency transformation technique in analog domain for converting low pass to low pass filter and low pass to high pass filter with frequency response.	L2	6M
	b)	Transform the prototype low pass filter with following system function into a high pass filter with a cutoff frequency Ω_c* $H(s) = \frac{\Omega_c}{s+2\Omega_c}$	L2	6M

UNIT-III

5.	a)	Construct the Direct form realization of system function. $H(Z) = 1 + 2Z^{-1} - 3Z^{-2} - 4Z^{-3} + 5Z^{-4}$	L3	6M
	b)	Construct the cascade realization of the system function. $H(Z) = 1 + \frac{5}{2}Z^{-1} + 2Z^{-2} + 2Z^{-3}$	L5	6M

OR

6.	a)	What is FIR filter? Write the necessary and sufficient condition for the linear phase characteristic of a FIR filter?	L1	2M
	b)	Explain the steps to be followed in designing FIR Filters using Fourier Series method.	L2	4M
	c)	Design an FIR digital filter to approximate an ideal Low pass filter with pass band gain of unity, cutoff frequency of $1kHz$, and working at a sampling frequency $f_s = 4kHz$. The length of the impulse response should be 11. Use Fourier Series method.	L3	6M

UNIT-IV

7.	a)	Discuss briefly about different types of number representation with examples.	L2	6M
	b)	Compare fixed point and floating point arithmetic.	L4	6M

OR

8.	a)	What is meant by Overflow limit cycle oscillations? Explain with example.	L2	6M
	b)	Find the characteristics of a limit cycle oscillation with respect to the system described by the difference equation $(n) = 0.97\ y(n-1) + x(n)$, Determinethe dead band of the filter.	L3	6M

UNIT-V

9.		Draw and Explain the architecture of TMS320C54X digital signal processor in brief.	L2	12M

OR

10.	a)	Explain the two categories of DSP's in detail.	L2	6M
	b)	What are the advantages of the DSP processors over conventional microprocessors?	L1	6M

Q.P. Code: 20ME0316 **R20**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

METAL CUTTING AND MACHINE TOOLS

(MECH)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Distinguish the cutting processes with neat sketches.	L4	12M
		OR		
2.	a)	Explain various types of chip breakers with neat sketches	L2	6M
	b)	In an orthogonal cutting operation on a lathe the cutting tool used had the tool designation of 0-10-8-8-6-70-1mm. Calculate the values of (i) Back rake angle and (ii) side rake angle.	L3	6M

UNIT-II

3.		Discuss tool failure and wear mechanism in cutting tool.	L3	12M
		OR		
4.	a)	Define tool life and explain the impact of coolants on tool life.	L2	6M
	b)	The following equation for tool life is given for a turning operation $VT^{0.13} f^{0.77} d^{0.37} = C$. A 60 minute tool life was obtained while cutting at V=30 m/min, feed =0.3 mm/rev and depth of cut = 2.5 mm. Determine the change in tool life if the cutting speed, feed and depth of cut an increased by 20% individually and also taken together.	L3	6M

UNIT-III

5.		Discuss about the lathe attachments with neat sketches .	L2	12M
		OR		
6.	a)	Explain the advantages and disadvantages of a turret lathe.	L5	6M
	b)	Name at least five work holding devices.	L2	6M

UNIT-IV

7.		Explain with neat sketches any one of the following i) Radial drilling machine ii) Sensitive drilling machine iii) Gang drilling machine.	L1	12M
		OR		
8.	a)	Name the types of cutters, work holding and tool holding devices used in drilling machine.	L2	6M
	b)	Explain briefly with sketches any four of the drilling operations.	L3	6M

UNIT-V

9.		Give the comparison among Grinding, lapping and honing.	L3	12M
		OR		
10.	a)	What is a 'grinding wheel'? What are the grinding wheel parameters that influence the grinding performance?	L3	6M
	b)	What are the advantages, limitations and applications of broaching?	L3	6M

Q.P. Code: 20CS0531 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
SOFT COMPUTING
(CSE & CSM)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	a)	Distinguish between Supervised Learning and Unsupervised Learning.	L4	6M
	b)	Analyze Learning Techniques in ANN.	L4	6M
		OR		
2.	a)	Compare Soft computing and Hard computing.	L5	6M
	b)	Describe Hebb Network in Artificial Neural Network.	L2	6M
		UNIT-II		
3.		Analyze Fixed weight networks advanced neural network.	L4	12M
		OR		
4.	a)	Generalize the Adaptive Resonance Theory Neural Network.	L6	6M
	b)	Illustrate the Support Vector Machine.	L3	6M
		UNIT-III		
5.	a)	List out the various operations and composition operations on Classical relations explain it.	L1	6M
	b)	Define Fuzzification and explain membership value assignment in fuzzy logic.	L2	6M
		OR		
6.		Explain about Fuzzy rule base and approximate reasoning in Fuzzy logic.	L2	12M
		UNIT-IV		
7.	a)	Describe the applications of genetic algorithm.	L1	6M
	b)	Identify the Advantages and Disadvantages of GeneticAlgorithm.	L2	6M
		OR		
8.	a)	List out the different reproduction and inheritance operatorsused in GA.	L2	6M
	b)	Describe various Encoding Techniques of Genetic algorithm.	L2	6M
		UNIT-V		
9.	a)	Discuss in detail about Fuzzy – Genetic Hybrid System	L4	6M
	b)	Identify the advantages and disadvantages of Fuzzy-Genetic hybrid systems.	L1	6M
		OR		
10.	a)	Illustrate the advantages and disadvantages of Neuro-Fuzzy hybrid systems.	L3	6M
	b)	Compare sequential , auxiliary and embedded hybrid systems	L5	6M

Q.P. Code: 20CS0901 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE

(CIA)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Discuss in detail about the Foundations of Artificial Intelligence.	L2	12M
		OR		
2.	a)	Explain the role of AI in Education and Finance.	L2	6M
	b)	Explain the role of AI in Online and telephone customer service.	L2	6M

UNIT-II

3.		Explain about Alpha-Beta Pruning with α and β algorithms. Prepare a Graph Treeand explain it.	L3	12M
		OR		
4.	a)	Explain in detail about the Process in Control Strategies.	L2	6M
	b)	What are the general steps in Problem Solving? Explain in detail why it is usedin Artificial Intelligence.	L4	6M

UNIT-III

5.	a)	What is Mathematical Deduction? How it helps to solve Logic Problems.	L2	6M
	b)	What is Propositional Logic? Explain the facts and types in it in detail.	L2	6M
		OR		
6.		Explain in detail about Natural Deduction system with an example.	L2	12M

UNIT-IV

7.	a)	Describe the approaches to Knowledge Representation.	L2	6M
	b)	Describe the important components of a script, with a suitable example.	L1	6M
		OR		
8.	a)	List the set of primitives and conceptual tenses used in Conceptual Dependency.	L1	6M
	b)	Represent the following facts using semantic nets: • John gave the book to Mary • John is 6 feet tall and that he is taller than Bill	L2	6M

UNIT-V

9.	a)	Distinguish between forward chaining and backward chaining.	L2	6M
	b)	Discuss about Characteristics and Capabilities of Expert Systems.	L2	6M
		OR		
10.	a)	List out the Benefits of Expert Systems.	L1	6M
	b)	Distinguish Model-based Expert system Vs Case based expert system	L2	6M

Q.P. Code: 20CS0537 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations February 2024
CLOUD COMPUTING
(CAD)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Explain in detail evolution of distributed computing.	L3	12M
		OR		
2.	a)	Illustrate the Service oriented Architecture.	L3	6M
	b)	Explain the following i) Cluster Computing ii) Cloud Computing iii) Grid Computing	L2	6M

UNIT-II

3.		Illustrate the Life Cycle of Service Level Agreement with neat diagram.	L3	12M
		OR		
4.	a)	Illustrate in detail Infrastructure as a Service.	L2	6M
	b)	Explain briefly about types of SLA.	L2	6M

UNIT-III

5.	a)	Discriminate the Binary Translation with Full Virtualization.	L5	6M
	b)	Summarize the Memory Virtualization concept.	L2	6M
		OR		
6.	a)	Compare and explain full virtualization and para virtualization.	L4	6M
	b)	Describe virtual clusters with its advantages.	L2	6M

UNIT-IV

7.		Discuss the following in detail: a) Network Level Security b) Host Level Security c) Application Level Security	L2	12M
		OR		
8.	a)	List and Explain the activities supported by IAM.	L1	6M
	b)	Analyze the aspects of data security.	L4	6M

UNIT-V

9.		Differentiate Cloud computing and Mobile cloud computing.	L4	12M
		OR		
10.	a)	Draw the Architecture of mobile cloud computing and explain	L1	6M
	b)	Discuss the context management architecture based on IRNA with neat diagram	L2	6M

Q.P. Code: 20CE0136 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
FOUNDATION ENGINEERING
(CIVIL)

Time: 3 Hours Max. Marks: 60

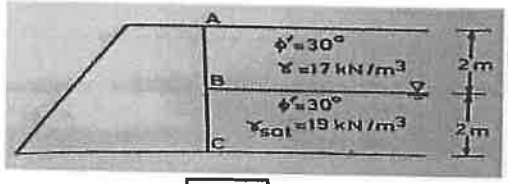
Answer one question from each unit (5 x 12 = 60 Marks)

UNIT-I

1. Define earth pressure theory and various types of lateral earth pressure with neat sketch. L1 12M

OR

2. Determine the lateral earth pressure at rest per unit length of wall as shown in fig. Also determine the resultant earth pressure. Take K0=1-Sinφ', γw=10 kN/m3. L3 12M



UNIT-II

3. a) With neat sketches explain different types of shear failures. L2 6M
   b) Determine the ultimate bearing capacity of a strip footing 1.20 m wide and having the depth of foundation of 1.0 m. Use Terzaghi's theory and assume general shear failure. Take φ = 35°, γ = 18 kN/m³, and C' = 15 kN/m². Take (Nc=57.8, Nγ=42.4, Nq=41.4). L3 6M

OR

4. Discuss the various methods of determination of allowable soil pressure in cohesionless soils. L2 12M

UNIT-III

5. a) A 30 cm diameter concrete pile is driven into a homogeneous consolidated clay deposit (cu=40 kN/m², α=0.7). If the embedded length is 10 m, estimate the safe load (F.S. =2.5). L3 6M
   b) A square concrete pile (30cm side) 10 m long is driven into coarse sand (γ=18.5 kN/m³, N=2.0). Determine the allowable load (F.S. =3.0). L3 6M

OR

6. Describe how the pile load test is conducted with a neat sketch. L2 12M

UNIT-IV

7. Discuss various forces acting on well foundation. L2 12M

OR

8. Describe the various components of pneumatic caisson with the help of neat sketch. L2 12M

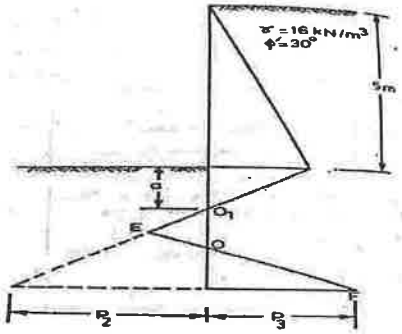
Q.P. Code: 20CE0136 R20

UNIT-V

9. Explain the procedure used in the analysis of the sheet pile with fixed earth support withneat sketch using equivalent beam method. L2 12M

OR

10. Determine the required of penetration of the cantilever sheet pile as shown in fig. Take γ =16 kN/m³. L3 12M



Q.P. Code: 20EE0217 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
POWER QUALITY
(EEE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Explain the evaluation procedure of power quality with neat diagram.	L2	12M
		OR		
2.	a)	Draw and explain the CBEMA curve.	L1	6M
	b)	Draw and explain the ITI curve.	L1	6M

UNIT-II

3.	a)	What is voltage sag? Explain clearly with relevant diagrams.	L1	6M
	b)	Explain the sources of sag and interruptions.	L2	6M
		OR		
4.	a)	Explain series compensation device.	L2	6M
	b)	Explain shunt compensation device.	L2	6M

UNIT-III

5.	a)	Explain in detail about resonance	L2	4M
	b)	Explain any two harmonics sources from commercial loads.	L2	8M
		OR		
6.	a)	Explain various passive filters for controlling the harmonic distortions.	L2	6M
	b)	Explain active filters for controlling the harmonic distortions.	L2	6M

UNIT-IV

7.		Explain the selecting of monitoring locations with neat diagram	L2	12M
		OR		
8.	a)	Explain in detail about disturbance analyzers and oscilloscopes.	L2	6M
	b)	Explain in detail about harmonics analyzers and flicker meters.	L2	6M

UNIT-V

9.		What is DVR? Explain the basic equivalent structure of DVR.	L1	12M
		OR		
10.		Draw and explain the schematic diagram and operating principle of solid-state breaker (SSB).	L2	12M

Q.P. Code: 20EC0430 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(ECE)

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) Accuracy ii) Precision	L3	4M
	b)	The expected value of the voltage across a resistor is 80 V. However, the measurement gives a value of 79 V. Calculate (i) Absolute error (ii) % Error (iii) Relative accuracy and (iv) % of Accuracy.	L3	8M

OR

2.	a)	Explain in detail about the working principle of a Differential Voltmeter.	L2	6M
	b)	Explain how a millimeter can be used as (i) DC voltmeter and (ii) AC voltmeter.	L2	6M

UNIT-II

3.		Derive the Deflection of Sensitivity.	L3	12M

OR

4.	a)	Write short notes CRT features.	L2	6M
	b)	Describe in detail the construction and working of a Digital Storage Oscilloscope.	L2	6M

UNIT-III

5.		Using a neat block diagram and Explain the operation of a function generator.	L1	12M

OR

6.	a)	Define Wave Analyzer	L5	2M
	b)	Describe the operation of Frequency selective type wave Analyzer using a neat diagram.	L2	10M

UNIT-IV

7.		Describe the operation of the Wheatstone bridge and derive the Expression for current when the bridge is unbalanced.	L3	12M

OR

8.	a)	Explain briefly how a Maxwell Bridge is used for measuring an unknown inductance.	L2	6M
	b)	A Maxwell bridge is used to measure inductive impedance. The bridge constants at balance are C_1= 0.01μF, R_1=470kΩ, R_2=5.1kΩ and R_3=100kΩ. Find the series equivalent of unknown impedance.	L3	6M

UNIT-V

9.		With a neat sketch and Explain the operation of LVDT.	L1	12M

OR

10.		Define Transducer and derive the Resistance of strain gauge transducer.	L2	12M

Q.P. Code: 20ME0329 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

INDUSTRIAL ENGINEERING AND MANAGEMENT

(MECH)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Classify the organizations and write its merits and demerits.	L3	12M
		OR		
2.	a)	Explain the Taylor"s principles of scientific management.	L3	6M
	b)	Describe the Fayol"s principles of management	L2	6M

UNIT-II

3.		What are the factors governing the plant location? Explain with any one specific industry.	L3	12M
		OR		
4.		Explain with neat sketch about the process layout and product layout along its merits and demerits	L2	6M

UNIT-III

5.	a)	Define Work Study and also state its objectives.	L5	6M
	b)	Compare Method Study and Work Measurement	L5	6M
		OR		
6.		Discuss about various methods used for work measurement.	L5	6M

UNIT-IV

7.		Classify and explain the pricing methods in detail.	L2	12M
		OR		
8.	a)	Explicate the concepts of Managerial Economics.	L2	6M
	b)	What do you mean by elasticity of demand? And also mention the factors governing the elasticity of demand.	L3	6M

UNIT-V

9.		Explain the importance of Supply Chain Management in the manufacturing Industry.	L3	12M
		OR		
10.	a)	List out the levels of Supply Chain Management and how they affect your business?	L3	6M
	b)	Explain about the drivers that determine the performance of Supply Chain.	L3	6M

Q.P. Code: 20EC0451 **R20**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

INTRODUCTION TO COMMUNICATION SYSTEMS

(CSE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	a)	Define modulation. Classify different types of modulation.	L1	7M
	b)	Determine the modulation index of AM, Percentage Modulation and Bandwidth of AM.	L3	5M
		OR		
2.	a)	Define wired communication and wireless communication.	L1	5M
	b)	Define Amplitude Modulation. Derive expression for AM wave.	L1	7M
		UNIT-II		
3.	a)	Define angle modulation. Classify different types of angle modulation and advantages of Angle modulation.	L1	8M
	b)	Compare AM, FM, PM.	L4	4M
		OR		
4.	a)	Explain the block diagram of indirect method in FM generation.	L2	6M
	b)	What are the differences between NBFM and WBFM?	L1	6M
		UNIT-III		
5.	a)	Define Noise and list the different types of noises.	L2	6M
	b)	Explain briefly about Noise in communication system.	L1	6M
		OR		
6.	a)	Differentiate between the Pulse Amplitude Modulation and Pulse Width Modulation with its modulated waveforms.	L2	6M
	b)	Compare PAM, PWM and PPM techniques.	L4	6M
		UNIT-IV		
7.	a)	What are the advantages & disadvantages of PCM?	L1	6M
	b)	Explain DPCM system with neat diagram.	L2	6M
		OR		
8.	a)	Discuss in brief about ASK coherent Demodulator using a neat block diagram.	L2	6M
	b)	Draw the block diagram of BPSK modulator and explain the operation.	L2	6M
		UNIT-V		
9.	a)	Discuss briefly about the evolution of Mobile radio communication.	L2	6M
	b)	Explain paging systems.	L2	6M
		OR		
10.	a)	Describe the features of the Frequency Division Multiple Access (FDMA) scheme.	L1	6M
	b)	Discuss about time division duplexing in wireless communication.	L2	6M

Q.P. Code: 20EE0227 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

GENERATION OF ENERGY FROM WASTE

(MECH & ECE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		What is MSW? Explain solid waste management.	L3	12M
		OR		
2.	a)	What is Agro based waste?	L3	2M
	b)	Discuss the Agro based waste briefly.	L2	10M

UNIT-II

3.		Explain the following types of charcoal production processes. (i) Earth kiln (ii) Brick kiln (iii) Steel kiln	L3	12M
		OR		
4.		Write short notes on (i) Slow pyrolysis method. (ii) Flash pyrolysis method. (iii) Fast Pyrolysis.	L2	12M

UNIT-III

5.		Explain the design, construction, and operation of updraft gasifier.	L5	12M
		OR		
6.	a)	What are the overall steps involved in Biomass gasification.	L5	6M
	b)	What are the factors affecting the Gasification process?	L2	6M

UNIT-IV

7.		Explain Design, Construction and Operation of Fixed bed combustor.	L1	12M
		OR		
8.	a)	What is Biomass Combustion?	L2	2M
	b)	What is the Biomass Combustion Mechanism?	L3	10M

UNIT-V

9.		What is meant by Biomass resources? Classify biomass resources based on their application?	L3	12M
		OR		
10.		Write short notes on (i) Thermo Chemical Conversion. (ii) Direct combustion of Biomass.	L3	12M

Q.P. Code: 20HS0813 **R20**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024
MANAGEMENT SCIENCE
(MECH, ECE, CSM, CAD & CIA)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Interpret outcome of Elton Mayo Experiments.	L3	12M
		OR		
2.	a)	Elucidate the functions of Management.	L2	6M
	b)	What are the 14 principles of administrative management?	L1	6M

UNIT-II

3.		Illustrate the objectives of Purchasing Function and its Purchasing Procedure.	L2	12M
		OR		
4.	a)	Define production and what are the different methods of production?	L3	6M
	b)	Distinguish between Job production and Batch production?	L5	6M

UNIT-III

5.	a)	Define Human Resource Management and describe its importance.	L1	6M
	b)	Managerial and operative function is tool to improve efficiency- Justify your answer.	L5	6M
		OR		
6.	a)	What do you understand by employee grievances in an organization?	L1	6M
	b)	Explain the steps involved in setting up grievance redressal mechanism.	L1	6M

UNIT-IV

7.		Classify the difference and importance of Vision, Mission and Strategy suitable for a Manufacturer of Electronics Components.	L4	12M
		OR		
8.	a)	What is 'SWOT' analysis? Draw the framework of SWOT analysis.	L1	3M
	b)	Analyze how 'SWOT' analysis can be used to evaluate appropriate corporate strategy.	L4	9M

UNIT-V

9.		Discuss Management Information System (MIS) and how it works in an organization.	L2	12M
		OR		
10.		Make use of JIT, MRP, Six Sigma changed the production environment – How?	L3	12M

Q.P. Code: 20ME0322 **R20**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester Regular & Supplementary Examinations Jan/Feb 2024

NON- CONVENTIONAL ENERGY RESOURCES

(CE & EEE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		How do you classify the energy sources and brief them.	L1	12M
		OR		
2.	a)	Define direct radiation and diffused radiation with a neat sketch.	L1	6M
	b)	Identify the environmental consequences of oil fuel usage.	L2	6M
		UNIT-II		
3.		Explain the process of generation of power in solar pond with a neat sketch and also mention its merits and demerits.	L3	12M
		OR		
4.	a)	Explain the working principle of flat plate collector with a neat sketch.	L2	6M
	b)	Describe the process of space heating with solar energy.	L2	6M
		UNIT-III		
5.		Illustrate the power generation process in HAWT with its merits and demerits.	L2	12M
		OR		
6.	a)	Describe the working of ducted wind turbine with its merits and demerits.	L5	6M
	b)	Explain the working of a hot wire anemometer with a neat sketch.	L2	6M
		UNIT-IV		
7.		Define biomass and why is it called renewable energy? What are the different forms of bio-energy?	L1	12M
		OR		
8.	a)	What are the factors affecting the generation of biogas?	L2	6M
	b)	Explicate various steps involved in the production of Ethanol.	L3	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.	L3	6M
	b)	Explain in detail about the hybrid systems.	L3	6M

Q.P. Code: 20HS0860 **R20**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024

SUPPLY CHAIN MANAGEMENT

(CIVIL)

Time: 3 Hours Max. Marks: 60

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

		UNIT-I		
1.		Explain distribution logistics system with suitable examples.	L3	12M
		OR		
2.	a)	Illustrate the role of supply chain in economy.	L3	6M
	b)	Analyze Supply Chain Performance Measures.	L2	6M
		UNIT-II		
3.		Categorize the methodologies for strategic sourcing.	L3	12M
		OR		
4.	a)	Evaluate the critical aspects in make vs buy continuum.	L2	6M
	b)	Dramatize Supplier selection and contract negotiation.	L2	6M
		UNIT-III		
5.	a)	Explain various types of distribution strategies in supply chain.	L5	6M
	b)	Evaluate the importance of network designing for organizations?	L5	6M
		OR		
6.	a)	Design a network for agriculture-based businesses.	L5	6M
	b)	Explain the role of decision making in supply chain performance.	L2	6M
		UNIT-IV		
7.		Construct product life cycle for FMCG product.	L1	12M
		OR		
8.	a)	Differentiate between Planning and Demand with illustration.	L2	6M
	b)	Evaluate Managing inventory for short life products.	L3	6M
		UNIT-V		
9.		Appraise the role of Supply Chain Integration.	L3	12M
		OR		
10.	a)	Evaluate the role of information in supply chain partnership.	L3	6M
	b)	Describe the impact of bullwhip effect on manufacturing.	L3	6M

Q.P. Code: 20HS0812 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(EEE, MECH & ECE)

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.	L4	12M
		OR		
2.	a)	What do you mean by elasticity of demand?	L1	6M
	b)	State the different types of elasticity of demand.	L2	6M

UNIT-II

3.		Write short notes on Iso - quants its features, Iso cost, least cost combination of inputsand MRTS.	L3	12M
		OR		
4.	a)	Evaluate the Cobb Douglas production function	L4	6M
	b)	Explain the significance of BEP and key terms of BEP.	L3	6M

UNIT-III

5.	a)	Define market structure.	L1	6M
	b)	State the features of Imperfect competition.	L1	6M
		OR		
6.	a)	What do you understand by economic liberalization?	L5	6M
	b)	Do you think „privatization" is an effective measure to turn around an ailing economysuch as India"s?	L2	6M

UNIT-IV

7.		Two projects, costing Rs 20000 each have the following cash inflows both have thesame which one do you choose and why?	L5	12M

Years	1	2	3	4	5
Machine X	8,000	12,000	10,000	9,000	7,000
Machine Y	12,000	8,000	12,000	7,000	7,000

Calculate: i) Pay Back Period ii) Accounting rate of Return

OR

8.	a)	What is the importance of Capital budgeting and what are its limitations?	L2	6M
	b)	What is meant by working capital and working capital cycle?	L3	6M

UNIT-V

9.		Journalize the following transactions in the books of Ms. Jeevani 2012,	L5	12M

Jan 1 Jeevani commenced business with cash Rs.5,00,000
2 Purchased goods for cash Rs.20,000
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

OR

10.	a)	Write a short note on the following Liquidity ratio.	L2	6M
	b)	Explain Gross profit ratio and Net profit ratio.	L1	6M

Q.P. Code: 20HS0815 **R20**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024

ENTREPRENEURSHIP DEVELOPMENT
(CSE)

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)	Discuss about Traits of an Entrepreneur. With economic and non-economic factors?	L2	6M
		OR		
2.	a)	Assess the Role of entrepreneurship in economic development	L5	6M
	b)	Briefly explain various types of entrepreneurs.	L3	6M
		UNIT-II		
3.	a)	Define micro, small and medium enterprises. How does the new definition differ from the old?	L3	6M
	b)	Briefly explain classification of MSMEs.	L3	6M
		OR		
4.		Summarize about Licensing and Leasing and Franchising.	L3	12M
		UNIT-III		
5.	a)	Write short note on Trademark, Trade Secrets and patents.	L3	6M
	b)	Explain about E-commerce in business.	L2	6M
		OR		
6.	a)	Briefly explain various types of innovation.	L3	6M
	b)	Examine the importance of Innovation in Entrepreneurship	L4	6M
		UNIT-IV		
7.		Summarize McClelland's Acquired Need Theory.	L2	12M
		OR		
8.	a)	What are the loans available for starting industrial venture in India?	L1	6M
	b)	Identify the different phases of EDP	L2	6M
		UNIT-V		
9.		Explain about the sources and needs of finance project	L1	12M
		OR		
10.	a)	How do you prepare project Report?	L4	6M
	b)	What is the need of project designing?	L1	6M

Q.P. Code: 20CE0144 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
GROUND IMPROVEMENT TECHNIQUES
(CIVIL)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	a)	Explain the criteria for the selection of a particular fill material around the drains.	L2	6M
	b)	Explain the interceptor drains with neat sketches.	L2	6M
		OR		
2.	a)	What are the different applications of grouting?	L1	6M
	b)	Explain the penetration grouting with neat sketches.	L2	6M

UNIT-II

3.	a)	What are the advantages of using Sandwick geo drains?	L1	6M
	b)	Explain the impact at ground surface method to densify granular soils.	L2	6M
		OR		
4.		Explain various in-situ densification methods for cohesive soils.	L2	12M

UNIT-III

5.	a)	Explain the proportioning techniques of mechanical soil stabilization.	L2	6M
	b)	Write short notes on sodium silicate stabilization.	L2	6M
		OR		
6.		Discuss the gradation limits for soil-cement stabilization and explain its construction procedure.	L2	12M

UNIT-IV

7.	a)	What are the stability checks that are to be applied on reinforced earth Walls?	L2	6M
	b)	Explain any four engineering applications of reinforced earth with Sketches.	L2	6M
		OR		
8.	a)	Write short notes on soil nailing.	L2	6M
	b)	What are the design principles of reinforced earth wall?	L2	6M

UNIT-V

9.		Explain different functions of geotextiles with neat sketches.	L2	12M
		OR		
10.	a)	What are geo-membranes? How geo-membranes differ from geo textiles?	L2	6M
	b)	What is a geo-grid? Explain different types of geo grids.	L2	6M

Q.P. Code: 20EE0232 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb-2024
POWER SYSTEMS PROTECTION
(EEE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Discuss the operating principle of SF6 circuit breaker, what are its advantages over other types of circuit breakers and for what voltage range it is recommended.	L1	12M
		OR		
2.		Explain the terms recovery voltage, restriking voltage and RRRV. Derive an expression for restriking voltage in terms of system capacitance and inductance.	L3	12M

UNIT-II

3.		Describe the principle of Impedance relay and explain its characteristics on R-X- planes.	L2	12M
		OR		
4.	a)	Derive the expression for torque developed in induction relay	L1	6M
	b)	What is universal torque equation? Using this equation derive the following (i) Impedance relay (ii) reactance relay (iii) Mho relay	L1	6M

UNIT-III

5.	a)	Enumerate the relaying schemes, which are employed for the protection of a modern alternator?	L1	6M
	b)	An 11kv,1000 MVA generator is provided with differential scheme of protection. The percentage of generator winding to be protected against phase to ground fault is 80%,the relay is set to be operate when there is a 15% out of balance current determine the value of resistance to be placed in neutral to ground connection?	L3	6M
		OR		
6.	a)	Describe the protection of the stator windings of 3-phase alternator against turn-to-turn faults.	L1	6M
	b)	A 6.6 kV, 4000 kV A star connected alternator with a transient reactance of 2 Ω /phase And negligible resistance, is protected by a circulating current protective system. The alternator neutral is earthed through a resistor of 7.5Ω. The relays are set to operate when there is an out of balance current of 1 A in the secondary windings of the 500/5 current Transformers. what percentage of each phase winding is protected against an earth fault?	L3	6M

UNIT-IV

7.		Describe the principle of bus -bar protection based on voltage differential systems. How does it Overcome the problems of saturation of CT's?	L1	12M
		OR		
8.	a)	Explain in detail about the Merz price voltage balanced system with a neat single line diagram.	L1	6M
	b)	Describe in detail the protection of parallel feeder and ring mains.	L1	6M

UNIT-V

9.		Explain the term insulation coordination. Describe the construction of volt -time curve and terminology associated with impulse testing.	L1	12M
		OR		
10.	a)	Discuss the phenomena of a lightning stroke.	L1	6M
	b)	Explain the working of valve type lightning arrester.	L1	6M

Q.P. Code: 20ME0336 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
OPERATIONS RESEARCH
(MECH)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1. Solve the following by using Big-M method. L3 12M
Maximize $Z=2X_1+3X_2+4X_3$ Subjectedto $3X_1+X_2+4X_3 \leq 600$, $2X_1+4X_2+2X_3 \geq 480$, $2X_1+3X_2+3X_3 = 540$ and $X_1, X_2, X_3 \geq 0$.

OR

2. a) Discuss the applications of Operations Research. L2 6M
b) Discuss the types of Operation Research models. L2 6M

UNIT-II

3. Solve the following transportation problem to maximize profit. L3 12M

	A	B	C	D	SUPPLY
P	40	25	22	23	100
Q	44	35	30	30	30
R	38	38	28	30	70
DEMAND 40		20	60	30	

OR

4. A Department has 5 employees and five jobs are to be performed. The time each man will take to perform each job is given in the following table below. How the job should be Allocated one per employee, so as to minimize the total man-hours. L3 12M

MACHINES / JOBS	A	B	C	D	E
1	9	3	10	13	4
2	8	17	13	20	5
3	5	14	8	11	6
4	11	13	9	12	3
5	12	8	14	16	7

UNIT-III

5. a) Explain Pure strategy and Mixed strategy. L1 6M
b) State briefly the applications of queuing models. L1 6M

OR

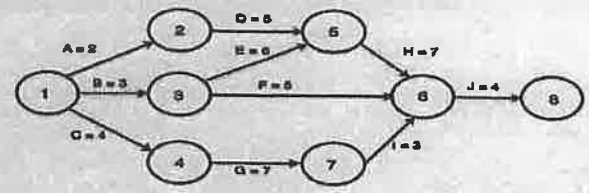
6. Solve the following GAME using the Dominance Principle. L3 12M

Firm A	Firm B				
	4	6	5	10	6
	7	8	5	9	10
	8	9	11	10	9
	6	4	10	6	4

Q.P. Code: 20ME0336 R20

UNIT-IV

7. Find the critical path and calculate the Total float, Free float. L4 12M



OR

8. a) List similarities and differences between PERT and CPM. L2 6M
b) Explain the following L2 6M
a)critical event b)critical activity c)Total float d)Free float

UNIT-V

9. The cost of a machine is Rs6100 and its scrap value is Rs.100. The maintenance costs found from experience are as follows. When should the machine be replaced? L3 12M

Year (n)	1	2	3	4	5	6	7	8
Running M/C Cost (Rs)	100	250	400	600	900	1200	1600	2000

OR

10. a) What is meant by sequencing Problem and Define total elapsed time? L3 6M
b) Explain the Bellman's principle of optimality. L3 6M

Q.P. Code: 20EC0436 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
WIRELESS COMMUNICATIONS
(ECE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Describe briefly about the cellular telephone system with a neat diagram. Also Explain 3G cellular networks.	L2	12M

OR

2.	a)	How cellular frequency reuse concept is useful in allocating same frequency channels in various cluster of cells.	L2	6M
	b)	Discuss the impact of adjacent channel interference on the system capacity.	L2	6M

UNIT-II

3.	a)	Derive the received power at a distance d from the transmitter for the two-ray ground bounce model.	L3	6M
	b)	Explain about Fresnel zone geometry model.	L2	6M

OR

4.	a)	Draw neat diagrams illustrating knife-edge geometry with appropriate notations.	L2	6M
	b)	If a transmitter produces 40W of power, express the transmit power in units of dBm, dBW. If 40W is applied to a unity gain antenna with 900MHz carrier frequency, find the receiver power in dBm at a free space distance of 120m from the antenna. Also, calculate the received power for a coverage distance of 12 km. (Assume unity gain receiver antenna.)	L2	6M

UNIT-III

5.	a)	What is fading? Classify different types of small-scale fading.	L3	6M
	b)	The speed of the aircraft is 500km/hr and it is heading towards the airport control tower at an elevation of 25 degrees. The communication between the aircraft tower and the plane takes place at a frequency of approximately 128MHz. What is the expected Doppler shift of the received signal in positive and negative direction?	L4	6M

OR

6.	a)	Evaluate flat fading effects due to Multipath time delay spread.	L4	6M
	b)	A vehicle receives a 900MHz transmission while traveling at a constant velocity for 10 s. the average fade duration for a signal level 10 dB below the rms level is 1 ms. How far does the vehicle travel during the 10 s interval? How many fades does the signal undergo at the rms threshold level during a 10 s interval? Assume that the local mean remains constant travel.	L4	6M

UNIT-IV

7.		Explain the basic structure of an adaptive equalizer with neat Diagram. Also explain Decision Feedback Equalization.	L2	12M

OR

8.	a)	Explain Maximum likelihood sequence estimation equalizer.	L2	6M
	b)	Explain about maximal ratio combining and equal gain diversity.	L3	6M

UNIT-V

9.		Describe MIMO systems with neat a diagram. How does spatial multiplexing works?	L2	12M

OR

10.	a)	Describe the features of the frequency division multiple access scheme.	L4	6M
	b)	Explain in detail packet radio schemes and packet radio protocols.	L3	6M

Q.P. Code: 20CS0537 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
CLOUD COMPUTING
(CSE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Discriminate the Challenges in Cloud Computing.	L5	12M
		OR		
2.	a)	Illustrate the evolution of scalable computing technology.	L3	8M
	b)	Differentiate between parallel and distributed computing Paradigms.	L4	4M

UNIT-II

3.	a)	Define service model.	L1	2M
	b)	Determine the service models in cloud computing.	L3	10M
		OR		
4.	a)	Illustrate in detail Infrastructure as a Service.	L3	4M
	b)	Describe in detail about PaaS.	L2	4M
	c)	Explain in detail about SaaS.	L2	4M

UNIT-III

5.	a)	Explain in detail different implementation level of virtualization.	L2	8M
	b)	List out the benefits of Virtualization.	L1	4M
		OR		
6.		Describe the CPU Virtualization in detail.	L2	12M

UNIT-IV

7.		Discuss the following in detail: a) Network Level Security b) Host Level Security c) Application Level Security	L2	12M
		OR		
8.	a)	Explain about Authentication Methods.	L2	6M
	b)	Interpret the various Authorization Methods.	L3	6M

UNIT-V

9.		Draw the Architecture of mobile cloud computing and explain.	L2	12M
		OR		
10.		Describe the following: a) Offloading in static environment b) Offloading in dynamic environment	L2	12M

Q.P. Code: 20CE0146 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
ENVIRONMENTAL IMPACT ASSESSMENT & MANAGEMENT
(CE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Describe in detail about the classification and prediction of impacts?	L2	12M
		OR		
2.	a)	What are the factors to be considered for taking decisions based on assessment of significance of an impact?	L1	6M
	b)	Write in detail about the impact evaluation and analysis.	L1	6M

UNIT-II

3.		What is the importance of overlay method in environmental impact assessment? Explain it.	L2	12M
		OR		
4.	a)	Write short notes on matrix method.	L1	6M
	b)	Make a note on impact interpretation and evaluation.	L2	6M

UNIT-III

5.	a)	List the conceptual approach to study surface water environment impacts.	L1	6M
	b)	What are the physical and chemical characteristics of water? Brief it.	L1	6M
		OR		
6.	a)	With flow chart, mention the area and point sources of air pollution	L2	6M
	b)	List the WHO and CPCB standards on air quality.	L1	6M

UNIT-IV

7.		Discuss the important aspects of assessment of impacts of any developmental activities on vegetation and wild life.	L2	12M
		OR		
8.	a)	Make a note on noise measurement.	L2	6M
	b)	With a table format, mention the OSHA noise exposure limits for the work environment.	L2	6M

UNIT-V

9.		Discuss about the Water pollution prevention & protection act and its functions.	L2	12M
		OR		
10.	a)	Discuss about the Air pollution protection act and its functions.	L2	6M
	b)	Define the Wild life act and its implementations.	L2	6M

Q.P. Code: 20EE0234 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
UTILIZATION OF ELECTRICAL ENERGY
(EEE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	a)	State and explain laws of illumination.	L1	6M
	b)	Six lamps are used to illuminate a certain room. If the luminous efficiency of each lamp is 12lumens/watt and the lamps have to emit a total lux of 10,000 lumens, calculate (i)Theme a spherical luminous intensity (ii)The cost of energy consumed in 3hours if the charge for electrical energy is 50 paisa per unit.	L3	6M
		OR		
2.	a)	Explain with sketch the principle and operation of fluorescent lamp	L3	6M
	b)	Write short notes on flood lighting	L2	6M

UNIT-II

3.	a)	What are the different types of heating? Write advantages of electric heating.	L1	6M
	b)	A low frequency induction furnace whose secondary voltage is maintained constant at 10 volts, takes 400 kW at 0.6 pf, when the hearth is full. Assuming the resistance of the secondary to vary inversely as the height of the charge and reactance to remain constant, height up to which the hearth should be filled to obtain maximum heat.	L3	6M
		OR		
4.		Explain the different methods of electric welding and their relative advantages	L3	12M

UNIT-III

5.	a)	What is the Classification of Electrical Drives?	L2	6M
	b)	What are the advantages and disadvantages of Electric drives?	L3	6M
		OR		
6.		What is temperature rise in motor? Derive the equation for Heating of Motor.	L2	12M

UNIT-IV

7.		A train is to run between two stations 1.6 km apart at an average speed of 40 kmph, the run is to be made to a quadrilateral N-T curve. Maximum speed is to be limited to 64 kmph, acceleration, to 2 kmph/s, coasting retardation to 0.16, and braking retardation to 3.2, Determine the duration of a acceleration, coasting and braking periods	L3	12M
		OR		
8.	a)	Discuss the speed-time curves for main line services.	L2	6M
	b)	A train has schedule speed of 60 km/hr between the stops which are 6 km apart. Determine the crest speed over the run assuming trapezoidal speed time curve. The train accelerates at 2 km/hr/sec and retards at 3 km/hr/sec. Duration of stops is 60s.	L2	6M

UNIT-V

9.	a)	Write short notes on specific energy consumption.	L1	6M
	b)	What factors affect the specific energy consumption?	L1	6M
		OR		
10.		A train weighing 200-ton accelerates uniformly from rest to a speed of 40 kmph up a gradient of 1 in 100, the time taken being 30 s. The power is then cut off and train coasts down a uniform gradient of 1 in 1,000 for period of 40 s. When brakes are applied for period of 20 s so as to bring the train uniformly to rest on this gradient Determine: 1. The maximum power output from the driving axles. 2. The energy taken from the conductor rails in kW-hr assuming an efficiency of 70%.Assume tractive resistance to be 45 N/ton at all speeds and allows 10% for rotational inertia.	L3	12M

Q.P. Code: 20ME0339 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
POWER PLANT ENGINEERING
(MECH)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		A 60 MW power station has an annual peak load of 50 MW.The power station supplies loads having maximum demands of 20 MW, 17 MW, 10 MW and 9 MW. The Annual load factor is 0.45. Find: (i) Average load. (ii) Energy supplied per year. (iii) Diversity factor. (iV) Demand factor	L3	12M
		OR		
2.		Explain the layout of steam power plant with neat sketch.	L3	12M

UNIT-II

3.		Explain about cyclone furnace, its design and construction.	L3	12M
		OR		
4.	a)	What are the requirements of pulverized mill?	L2	6M
	b)	Illustrate the working of a chain grate stoker	L2	6M

UNIT-III

5.	a)	Explain the process of reheating and regeneration.	L2	6M
	b)	What is meant by super charging and mention the advantages?	L2	6M
		OR		
6.		List out the advantages and disadvantages of combined cycle power plant.	L2	12M

UNIT-IV

7.		Explain governing mechanism of a Pelton turbine with a neat sketc	L2	12M
		OR		
8.		What is meant by Hydropower? Explain Hydrological cycle with a neat sketch.	L2	12M

UNIT-V

9.		Discuss sodium-graphite reactor with a line diagram.	L2	12M
		OR		
10.	a)	Explain nuclear fission process.	L2	6M
	b)	What is nuclear fuel and list the advantages of nuclear nergy?	L2	6M

Q.P. Code: 20EC0441 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
DIGITAL IMAGE PROCESSING
(ECE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Explain about image sampling and quantization process with proper steps.	L2	12M
		OR		
2.	a)	Discuss the method for representation of a digital image.	L3	6M
	b)	Explain the neighbors of a pixel with suitable example.	L2	6M

UNIT-II

3.	a)	Discuss the properties of Unitary transforms.	L3	8M
	b)	Define 1D and 2D – Discrete Fourier Transform with equations.	L2	4M
		OR		
4.	a)	Deduce the basis matrix of Walsh Transform for N = 4.	L3	6M
	b)	Calculate Walsh transform for the given image. $f(x,y) = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$	L3	6M

UNIT-III

5.	a)	Illustrate the contrast stretching in image enhancement with suitable example.	L3	6M
	b)	Define histogram and draw the histogram four basic image types.	L2	6M
		OR		
6.	a)	Define the following terms: Saturation, Hue and Brightness.	L1	6M
	b)	Draw the CIE chromaticity diagram and mention its significance.	L2	6M

UNIT-IV

7.	a)	Draw the degradation/restoration model in image processing and describe the each part presented on it.	L3	8M
	b)	Differentiate the Image Enhancement and Image Restoration.	L2	4M
		OR		
8.	a)	List out the different types of thresholding.	L2	6M
	b)	Discuss the Edge detection with the help of the following operators: i) Gradient ii) Roberts iii) Prewitt	L3	6M

UNIT-V

9.	a)	Define Entropy and irrelevant information.	L1	6M
	b)	Consider an image strip of size 50 × 100. The image consists of five vertical stripes. The gray levels of the stripes are 128, 64, 32, 16 and 8. The corresponding widths of the stripes are 35, 30, 2 0, 10 and 5 pixels respectively. If this stripe image coded is by Huffman coding, determine its efficiency.	L3	6M
		OR		
10	a)	Why Huffman coding is called as block code.	L2	6M
	b)	Explain the functional block diagram of a transform coding technique.	L2	6M

Q.P. Code: 20CS0543 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024

DATA SCIENCE

(CSE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	a)	List the five main skills and behavioral characteristics of data scientists?	L1	6M
	b)	Illustrate in detail the data types of R?	L3	6M
		OR		
2.	a)	Discuss dirty data with suitable example?	L2	6M
	b)	How dirty data can be detected in the data exploration phase with Visualizations?	L3	6M

UNIT-II

3.	a)	Examine the application property of Wilcoxon rank-sum test?	L3	6M
	b)	Discriminate about Difference of Means?	L5	6M
		OR		
4.	a)	Explain Apriori Algorithm with example?	L2	6M
	b)	Illustrate any two approaches to improve Apriori's efficiency when the data set is large?	L3	6M

UNIT-III

5.	a)	Which two basic measures does the entropy methods select the most informative attribute?	L1	6M
	b)	Justify the usage of logistic regression with example?	L6	6M
		OR		
6.	a)	Describe Decision Trees in detail with example?	L2	6M
	b)	Discuss Naïve Bayes classification method considering an example?	L2	6M

UNIT-IV

7.	a)	How hierarchical agglomerative clustering is different from density based clustering?	L2	6M
	b)	Illustrate the method to find k clusters from a collection of M objects with n attributes?	L3	6M
		OR		
8.	a)	Define time series and give the goals of time series analysis?	L1	6M
	b)	List and describe Additional time series methods?	L2	6M

UNIT-V

9.		Illustrate in detail the steps involved in the process of Text Analysis done by organizations?	L3	12M
		OR		
10.	a)	Explain how categorizing documents by topics is done?	L2	6M
	b)	Interpret the procedure used in data science to gain insights into customer opinions?	L3	6M

Q.P. Code: 20CE0150 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
DESIGN & DRAWING OF IRRIGATION STRUCTURES
(CE)

Time: 3 Hours Max. Marks: 60

Answer one question from each unit **(1 x 60 = 60 Marks)**

1.	Design a surplus weir of a tank forming a chain of tanks. The combined catchment area of the group of tanks is 60 square kilometers and the area of the catchment intercepted by the upper tank is 50 square kilometers. It is decided to store water in the tank to the level of +122.00m limiting the submersion of foreshore lands up to a level of +122.75m. The ground level at the proposed site of work is +121.00m, and the ground level below the proposed surplus slopes of till it reaches+ 120.00m in about 6metres distance. The tank bund has a top width of 2meters at level +124.50 with 2:1 side slope on either side. The tank bunds are designed for a saturation gradient of 4:1 with one-meter clear cover. The foundations are of hard gravel at a level of +119.50m near the site of work. Assume any other suitable data. Draw the Plan, Longitudinal Section and Longitudinal Elevation of the weir.	L6	60M
	OR		
2.	Design a Type III siphon aqueduct for the data given below. Draw important views on a separate drawing sheet. Assume any missing data suitably Discharge of the canal : 80- cumecs Bed width of canal : 25 m Depth of water in canal : 3m Bed level of canal : 180m Flood discharge : 340 cumecs High flood level : 163.5 m Bed level of drainage : 160m General ground level : 162m	L6	60M

Q.P. Code: 20EE0237 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
ELECTRICAL ENERGY CONSERVATION AND AUDITING
(EEE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Explain about the energy inendance and security act of 2007 and energy policy act of 1992.	L2	12M
		OR		
2.	a)	What is meant by the term "energy audit" and what are its objectives?	L1	6M
	b)	Discuss briefly about the energy conservation with suitable examples.	L2	6M

UNIT-II

3.		Illustrate Energy Efficient Motors (EEMS).Describe the factor affecting the energy efficient motor.	L4	12M
		OR		
4.	a)	Illustrate the loss distribution in energy efficient motors.	L2	6M
	b)	Demonstrate effect of harmonics on Pow factor.	L3	6M

UNIT-III

5.	a)	Describe the Applications of lux meter	L1	6M
	b)	Explain about Good lighting system design and practice.	L2	6M
		OR		
6.	a)	Illustrate Energy Instruments- Watt Meter & Tongue Tester.	L3	12M

UNIT-IV

7.		Demonstrate the different techniques of DSM with necessary examples.	L3	12M
		OR		
8.	a)	What is meant by demand side management and list out its benefits?	L2	6M
	b)	Write short notes on strategic conservation.	L2	6M

UNIT-V

9.		A Distribution Transformer Cost Rs.2,00,000 and has useful life of 25 years. If the salvage value is Rs.10,000 and rate of annual compound interest is 10%, calculate the amount to be saved annually for Replacement of the transformer after the end of 25 years by sinking fund method.	L3	12M
		OR		
10.	a)	Discuss about net present value calculations.	L2	6M
	b)	Discuss about the methods available for determining the annual rate.	L2	6M

Q.P. Code: 20ME0342 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024

MODERN MACHINING METHODS

(ME)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Discuss the need and characteristics of Modern Machining Methods with their advantages in the current industry?	L3	12M
		OR		
2.	a)	Explain the differences between Conventional and Non- Conventional machining process	L3	6M
	b)	Explain the working principle of water jet machining (WJM) with its applications?	L2	6M

UNIT-II

3.		List out the advantages, disadvantages, and applications of the Electrical Discharge Grinding (EDG) process.	L3	12M
		OR		
4.	a)	Explain the working principle of wire cut EDM and its applications	L2	6M
	b)	With a neat sketch, explain the working of a Electrical Discharge Machining Process (EDM).	L2	6M

UNIT-III

5.	a)	What is the principle of Electro Chemical Machining (ECM) and Discuss its need for industry .	L5	6M
	b)	Draw the schematic layout of the Electro Chemical Machining (ECM) setup and explain the major parts in it.	L5	6M
		OR		
6.	a)	List out the major techniques used in the Chemical machining process and discuss any one technique.	L5	6M
	b)	Write the advantages, disadvantages and applications of Electro Chemical Grinding (ECG).	L2	6M

UNIT-IV

7.		Draw the schematic layout of the Electron Beam Machining (EBM) and et-up and explain its industrial applications.	L1	12M
		OR		
8.	a)	Write the advantages, disadvantages, applications of Plasma Arc Machining (PAM).	L2	6M
	b)	Explain the parts of Laser Beam Machining (LBM) briefly.	L3	6M

UNIT-V

9.		Discuss briefly about the need of Nano fabrication Techniques and specify advantages and disadvantages.	L3	12M
		OR		
10.	a)	Discuss about the Micro Fabrication Technique-film deposition.	L3	6M
	b)	Write a short note on doping technique of Sol-gel method.	L3	6M

Q.P. Code: 20EC0442 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
VLSI DESIGN
(ECE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	a)	Illustrate the steps involved in NMOS fabrication process with neat sketches.	L2	6M
	b)	Discuss about body bias effect in the NMOS transistor.	L2	6M
		OR		
2.	a)	Determine the relationship between I_{ds} & V_{ds} in non-saturated region.	L3	6M
	b)	Explain in detail about Transconductance.	L2	6M

UNIT-II

3.	a)	Explain the steps involved in VLSI Design flow.	L2	6M
	b)	Construct the stick diagram of a 2-input CMOS NAND gate.	L3	6M
		OR		
4.	a)	Illustrate λ-design rules for contact cuts.	L2	6M
	b)	How a P-MOS transistor forms in lambda-based design rules? Explain.	L1	6M

UNIT-III

5.	a)	Sketch 2 x 1 mux using transmission gates.	L3	6M
	b)	Explain the implementation of AOI using CMOS design style with neatsketches.	L2	6M
		OR		
6.	a)	Discuss about the Power Estimation in CMOS circuit.	L2	6M
	b)	Explain about Power delay estimation in VLSI circuits.	L2	6M

UNIT-IV

7.	a)	Explain different adder designs in sub circuit design with neat sketches.	L2	6M
	b)	Differentiate Comparator and Magnitude Comparator with example.	L4	6M
		OR		
8.	a)	Construct and explain the circuit diagram of 4-bit Ripple Carry Adder.	L3	6M
	b)	Construct and explain the ripple counter.	L3	6M

UNIT-V

9.	a)	Illustrate the architecture of FPGA with neat sketch.	L2	6M
	b)	Discuss about the merits of FPGA over other PLD architectures.	L2	6M
		OR		
10.	a)	What is FPGA. Draw and explain basic structure of FPGA.	L1	6M
	b)	Discuss about the Fault coverage and how to find it?	L2	6M

Q.P. Code: 20CS0540 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
MOBILE APPLICATION DEVELOPMENT
(CSE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Construct Android Architecture with neat sketch.	L6	12M
		OR		
2.	a)	What is AVD? Explain AVD in android with pros and cons.	L2	6M
	b)	Explain UI widgets in android.	L2	6M

UNIT-II

3.		Discuss in detail about action bar with example program.	L3	12M
		OR		
4.	a)	Describe the Relative Layout with an example.	L2	6M
	b)	Identify the views Time Picker in android.	L3	6M

UNIT-III

5.	a)	Define a procedure to provide database connection using SQLite database.	L1	6M
	b)	What are the Operations supported by a Content Provider?	L1	6M
		OR		
6.		Demonstrate use of Toggle Button class with example. Play Music on toggle on and music off on toggle off.	L2	12M

UNIT-IV

7.		Explain in detail about binding activities to services?	L2	12M
		OR		
8.	a)	What is the purpose of the Image Switcher?	L1	6M
	b)	Discuss about Threading concept?	L2	6M

UNIT-V

9.		How the data access storage is worked with files and folders in web development?	L1	12M
		OR		
10.	a)	How the multitask scheduling can be done using Background agent?	L1	6M
	b)	Explain versions and features Of Silverlight	L2	6M

Q.P. Code: 20ME0356 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
FIRE & SAFETY ENGINEERING
(CE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		What do you understand by the term direct and indirect fire losses? Explain the terms using the iceberg analogy.	L3	12M
		OR		
2.	a)	Differentiate between piloted ignition and spontaneous ignition.	L3	6M
	b)	What do you understand by the term premixed burning and buoyant diffusion flames?	L2	6M

UNIT-II

3.		Classify pumps and explain piston pump in detail with neat sketch.	L3	12M
		OR		
4.	a)	Explain the working of gear pump with neat sketch.	L2	6M
	b)	Discuss the term head loss in a flow through pipes and classify them.	L2	6M

UNIT-III

5.	a)	Discuss the methods followed for fire protection and list the principle of passive fire protection methodology.	L5	6M
	b)	Explain the purpose of compartmentation in a building. How can the aim of compartmentation be defeated?	L5	6M
		OR		
6.	a)	Explain the fire behavior of common materials used in buildings	L5	6M
	b)	Name important toxic products of building materials and content in a fire accidents with their effects on human.	L2	6M

UNIT-IV

7.		Describe the working of bimetallic element heat detectors used for fire identification with neat sketch.	L1	12M
		OR		
8.	a)	Identify the components used in a typical fire alarm system?	L2	6M
	b)	Tabulate the types of fire protection hardware used in regular practice?	L3	6M

UNIT-V

9.		What are the different ways in which water as an extinguisher medium is delivered from extinguishers?	L3	12M
		OR		
10.	a)	What are the fire fighting fundamentals?	L3	6M
	b)	How the rating of extinguishers are made?	L3	6M

Q.P. Code: 20EC0453 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
INTRODUCTION TO IOT
(EEE & CSE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	a)	With a neat sketch, explain the request-response communication model of IoT.	L3	6M
	b)	Describe various logical functional blocks of IoT.	L3	6M
		OR		
2.	a)	Illustrate the physical generic block diagram of an IoT device and explain it briefly.	L3	6M
	b)	Define an internet protocol and compare IPV4 and IPV6.	L2	6M

UNIT-II

3.		Explain the implementation of IoT technology in smart cities.	L4	12M
		OR		
4.	a)	With the help of following sectors explain how IoT technology is impacting on the end-to-end value chain in the logistics sector: (i) Route generation & scheduling. (ii) Fleet tracking.	L3	6M
	b)	Explain how the IoT technology is impacting the healthcare sector and changing our everyday lifestyle with the following examples: Health & Fitness monitoring.	L3	6M

UNIT-III

5.	a)	Draw the structure of software defined networking for IoT & Explain it.	L5	6M
	b)	Describe with neat sketch the Information Model specification in IoT system design.	L3	6M
		OR		
6.	a)	Explain Benefits' of python programming language.	L2	6M
	b)	Describe with neat sketch the Information Model specification in IoT system Design.	L2	6M

UNIT-IV

7.	a)	Illustrate how to interface a LED to raspberry pi and write a program to blink.	L3	6M
	b)	Describe various features of a Raspberry Pi device.	L2	6M
		.OR		
8.	a)	Write a short note on various raspberry pi interfaces used for data transfer.	L3	6M
	b)	Explain the use of GPIO pins in an IoT device.	L3	6M

UNIT-V

9.	a)	Explain Domain model specifications for the Intrusion Detection system.	L3	6M
	b)	Write a python program for REST service and smart parking using Django.	L4	6M
		OR		
10.	a)	Design a weather monitoring IoT system using REST based.	L5	6M
	b)	Implement the air pollution monitoring system using the Web Socket approach.	L4	6M

Q.P. Code: 20CE0148 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
ELEMENTS OF ROAD TRAFFIC SAFETY
(MECH & ECE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Analyze the various road geometric design elements and how they are related to cause Road accidents.	L3	12M
		OR		
2.	a)	Identify the various measures to be taken into account to prevent the accident caused by Pedestrian.	L3	6M
	b)	Explain the enforcement uses in collection of accident data.	L2	6M

UNIT-II

3.		Describe the various aspects which are indicated in regulation of vehicles.	L3	12M
		OR		
4.	a)	Explain the zoning and parking space requirement of IRC standards?	L2	6M
	b)	Explicate the speed zoning and criteria considered to determine speed zoning.	L2	6M

UNIT-III

5.	a)	Describe the stop lines with neat sketch.	L5	6M
	b)	Clarify the concept of centre lines with neat sketch.	L5	6M
		OR		
6.	a)	Why street lighting is needed for road users?	L5	6M
	b)	Describe the tunnel lighting.	L2	6M

UNIT-IV

7.		Discuss the Informatory signs and Route marker signs with neat sketch?	L1	12M
		OR		
8.	a)	Briefly explain about Indication signs with neat sketch.	L2	6M
	b)	Why traffic signing requires International standardization?	L3	6M

UNIT-V

9.		List the various Traffic control methods &explain any four of them in detail?	L3	12M
		OR		
10.	a)	What is meant by Signal Face, explain it with neat sketch?	L3	6M
	b)	Why co-ordination of signals is needed?	L3	6M

Q.P. Code: 20HS0861 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
BUSINESS ETHICS
(ECE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	Define Business ethics and write the importance and functions of B.E?	L1	12M
	OR		
2.	Explain how modern ethical models will be helpful in Decision making?	L2	12M

UNIT-II

3.	What are the different advertising ethics that should be kept in designing the advertisement?	L1	12M
	OR		
4.	Performance appraisal will be done on the basis of employee ethics – Justify.	L5	12M

UNIT-III

5.	How insider trading can be marked as unethical financial Behavior?	L5	12M
	OR		
6.	Accessibility of the Technology is catalyzing cyber-crimes - Elucidate.	L5	12M

UNIT-IV

7.	Write about different theory of corporate governance.	L2	12M
	OR		
8.	Why Corporate governance is important in the present scenario.	L1	12M

UNIT-V

9.	Illustrate the note of Institutional investors in corporate governance.	L4	12M
	OR		
10.	How the Corporate Social responsibility is leading to social development of country.	L1	12M

Q.P. Code: 20EE0243 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024
APPLICATIONS OF ELECTRICAL POWER
(CE, MECH & ECE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		A machine shop 40m×20m is to have an illumination of 160lux on working plane. The lamps are mounted on 6m above the working plane. Give the layout of a suitable installation. a) Using filament lamp. b) Using 50 watts fluorescent lamp. Assume necessary data.	L3	12M
		OR		
2.	a)	Explain with sketch the principle and operation of fluorescent lamp.	L3	6M
	b)	Write short notes on incandescent lamp.	L2	6M

UNIT-II

3.		Discuss the principle, advantages and disadvantages of dielectric heating.	L2	12M
		OR		
4.	a)	Discuss briefly about induction heating process.	L2	6M
	b)	A slab of insulating material 150 sq cm in area and 1 cm thick is to be heated by dielectric heating. The power required is 400 W at 30 × 106 cps. Materials have permittivity of 5 and power factor of 0.05. Determine voltage necessary.	L2	6M

UNIT-III

5.	a)	Write briefly about flash welding.	L1	6M
	b)	Differentiate between A.C and D.C welding.	L2	6M
		OR		
6.	a)	Explain about metal arc welding, carbon arc welding methods with necessary illustrations.	L2	6M
	b)	What type of electric supply is suitable for electric arc welding?	L2	6M

UNIT-IV

7.		Discuss the various applications of electrolysis in detail.	L2	12M
		OR		
8.	a)	Explain Electrodeposition of rubber in detail.	L2	6M
	b)	What are the various operations involved in electroplating.	L1	6M

UNIT-V

9.		Discuss the electrical features of a traction motor for effective traction systems.	L2	12M
		OR		
10.	a)	Discuss the speed-time curves for urban service.	L2	6M
	b)	A sub urban electric train has a maximum speed of 70 km/hr. The schedule speed including a station stop of 30 sec in 45 km/hr. If the acceleration is 1.5 km/hr/sec. Find the value of retardation when the average distance between stops is 600 m.	L3	6M

Q.P. Code: 20ME0357 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech IV Year I Semester Regular Examinations Jan/Feb 2024

WASTE RESOURCE MANAGEMENT

(EEE & CSE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.	a)	Explain the types of waste management.	L2	6M
	b)	Explain how manufacturing companies can reduce their waste generation.	L2	6M
		OR		
2.	a)	What role does technology play in modern waste management?	L1	6M
	b)	What are the merits and demerits of waste resource management?	L1	6M

UNIT-II

3.		Briefly explain the types of solid waste management.	L3	12M
		OR		
4.		How does incineration help in the management of solid waste? Describe the incineration technologies and air emissions and its control in detail.	L2	12M

UNIT-III

5.	a)	Discuss the classification of Biomedical Waste and their uses.	L2	6M
	b)	Explain the terms autopsy centers and paramedics.	L2	6M
		OR		
6.	a)	Define the term Disposal? What are the standards provided by disposal?	L2	6M
	b)	List out the challenges and measures of biomedical waste during the COVID-19 pandemic.	L2	6M

UNIT-IV

7.	a)	Write a short note on Radioactive waste and Chemical waste.	L1	6M
	b)	Explain in detail the effect of why both low-risk and high-risk products are costly?	L2	6M
		OR		
8.		Explain the public health and the environmental effects of hazardous waste.	L2	12M

UNIT-V

9.		Illustrate and explain the types of waste collection.	L3	12M
		OR		
10.	a)	What are disposal options are there in disposal of waste and explain briefly	L2	6M
	b)	List out the environmental effects of landfill.	L2	6M

Q.P. Code: 20HS0830 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations Jan/Feb 2024
ALGEBRA AND CALCULUS
(Common to all)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1. a) Reduce the matrix $A=\begin{bmatrix}1&2&3&2\\2&3&5&1\\1&3&4&5\end{bmatrix}$ into echelon form and find its rank. L3 6M

   b) Find whether the following equations are consistent if so solve them $x+y+2z=4\,;2x-y+3z=9\,;3x-y-z=2.$ L3 6M

OR

2. a) Find the Eigen values and Eigen vectors of the matrix $A=\begin{bmatrix}5&-2&0\\-2&6&2\\0&2&7\end{bmatrix}$ L3 6M

   b) Show that the matrix $A=\begin{bmatrix}-2&-2&1\\2&1&2\\3&-1&2\end{bmatrix}$ satisfies its characteristic equation using Cayley - Hamilton theorem. L2 6M

UNIT-II

3. State the Taylor's theorem and using Maclaurin's series expand tan x upto the fifth power of x and hence find the series for log (sec x). L3 12M

OR

4. a) If $u=f(y-z,z-x,x-y)$ *prove that* $\frac{\partial u}{\partial x}+\frac{\partial u}{\partial y}+\frac{\partial u}{\partial z}=0$ by using Chain rule. L3 6M

   b) Verify if $u=2x-y+3z,\ v=2x-y-z,\ w=2x-y+z$ are functionally dependent and if so, find the relation between them. L2 6M

UNIT-III

5. a) Change the order of integration in $I=\int_0^1\int_x^{2-x} xy\,dydx$ and hence evaluate the same. L5 6M

   b) Evaluate $\int_0^{\log 2}\int_0^x\int_0^{x+y} e^{x+y+z}\,dzdydx.$ L5 6M

OR

6. a) Evaluate $\int_0^1\int_0^{\sqrt{1-x^2}}\int_0^{\sqrt{1-x^2-y^2}}\frac{1}{\sqrt{1-x^2-y^2-z^2}}\,dzdydx$ L5 6M

   b) Evaluate the integral by transforming into polar coordinates L2 6M

$$\int_0^a\int_x^{\sqrt{a^2-y^2}} y\sqrt{x^2+x^2}\,dxdy$$

UNIT-IV

7. a) Find the directional derivative of xyz^2+xz at (1,1,1) in the direction of no the surface $3xy^2+y=z$ at (0,1,1). L3 6M

   b) If $\vec{f}=(x+2y+az)i+(bx-3y-z)j+(4x+cy+2z)k$ is irrotational then find the constants a, b *and* c. L3 6M

OR

8. a) Find the angle between the normal to the surface $xy=z^2$ at the points $(4,1,2)$ *and* $(3,3,-3)$. L2 6M

   b) Show that the vector $(x^2-yz)\vec{i}+(y^2-zx)\vec{j}+(z^2-xy)\vec{k}$ is irrotational and find its scalar potential. L3 6M

Q.P. Code: 20HS0830 R20

UNIT-V

9. Verify Green's theorem in a plane for $\oint (x^2-xy^3)dx+(y^2-2xy)dy$ where 'c' is a square with vertices (0,0)(2,0)(2,2) *and* (0,2). L4 12M

OR

10. a) State Gauss's divergence theorem. L3 2M

    b) Apply Stoke's theorem to evaluate $\oint(ydx+zdy+xdz)$ where c is the curve of intersection of the sphere $x^2+y^2+z^2=a^2$ and $x+z=a$ L3 10M

Q.P. Code: 20HS0849 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations Jan/Feb 2024

APPLIED PHYSICS

(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)	Discuss the theory of interference of light due to thin films by reflection with suitable ray diagram.	L1	4M
	b)	Derive the condition for bright and dark rings interference in the case of thin films by reflected light.	L4	8M
		OR		
2.	a)	Define diffraction. Distinguish between Fraunhofer and Fresnel's diffraction,	L4	6M
	b)	Compare Interference and Diffraction.	L2	6M

UNIT-II

3.	a)	What are the postulates, merits and drawbacks of classical free electron theory?	L1	6M
	b)	Derive an expression for electrical conductivity in a metal by using classical free electron theory.	L4	6M
		OR		
4.	a)	State and Explain Gauss's Theorem for divergence.	L2	6M
	b)	State and Explain Stoke's Theorem for curl.	L2	6M

UNIT-III

5.	a)	Describe the construction and working principle of He-Ne Laser with the help of a neat diagram.	L2	8M
	b)	What are the advantages of He-Ne laser.	L1	4M
		OR		
6.	a)	Describe optical fiber communication system with block diagram.	L2	8M
	b)	Mention the applications of optical fiber.	L1	4M

UNIT-IV

7.		Define Doping. Explain the formation of n-type semiconductors with band diagram	L1	12M
		OR		
8.	a)	Describe the Hall Effect in semiconductors.	L2	8M
	b)	What are the applications of Hall Effect.	L1	4M

UNIT-V

9.		What is Meissner effect? Explain the Type-I and Type-II superconductors.	L2	12M
		OR		
10.	a)	What are the techniques available for synthesizing nanomaterials?	L1	4M
	b)	Explain ball milling technique for synthesis of nanomaterial.	L2	8M

Q.P. Code: 20HS0802 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations Jan/Feb 2024

APPLIED CHEMISTRY

(EEE & ECE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Define Electrode Potential. Derive the Nernst equation for a single electrode potential and write its applications.	L1	12M
		OR		
2.	a)	What is primary Battery and secondary Battery?	L3	6M
	b)	Explain the Construction and working of Lead acid battery.	L2	6M

UNIT-II

3.		What is Crystal field theory? Explain the crystal field splitting in octahedral and tetrahedral Complexes.	L3	12M
		OR		
4.	a)	Explain Planck's Quantum Theory.	L2	6M
	b)	Write short note on Wave-Particle duality of an electron	L2	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)	Write a note on Thermoplastic and Thermosetting resin	L3	6M
	b)	Explain the properties and uses of Bakelite and Nylon-6,6.	L2	6M

UNIT-IV

7.		Explain principle, instrumentation and applications of UV-visible Spectroscopy?	L1	12M
		OR		
8.		What is meant by Chromatography? Define the instrumentation, working and applications of High Performance Liquid Chromatography (HPLC).	L2	12M

UNIT-V

9.		Write a brief note on Fullerenes and Carbon nano tubes	L3	12M
		OR		
10.		Discuss about Super conductors and their applications?	L2	12M

Q.P. Code: 20HS0804 **R20**

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

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Describe the estimation of hardness by EDTA method.	L3	12M
		OR		
2.	a)	Describe the Ion exchange process for demineralization of water?	L3	6M
	b)	Explain the process of scale and sludge formation in boilers.	L2	6M

UNIT-II

3.		Explain various factors influencing the rate of corrosion?	L3	12M
		OR		
4.	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

UNIT-III

5.	a)	Describe the preparation, properties and uses of Bakelite.	L3	6M
	b)	Distinguish between Thermoplastics and Thermosetting plastics.	L4	6M
		OR		
6.	a)	What are significance of the Fuels for IC Engines	L1	6M
	b)	Write a note on Octane value and Cetane value.	L1	6M

UNIT-IV

7.		Define Cement. Explain in detailed about manufacture of Portland Cement?	L2	12M
		OR		
8.	a)	Define Refractories? Give the classification of refractories with examples.	L1	6M
	b)	Write a note on Fiber reinforced materials.	L1	6M

UNIT-V

9.		Discuss the principle, instrumentation and applications of Transmission electron microscopy (TEM).	L3	12M
		OR		
10.	a)	Write the applications of Colloids.	L1	6M
	b)	Write an account on carbon nanotubes.	L1	6M

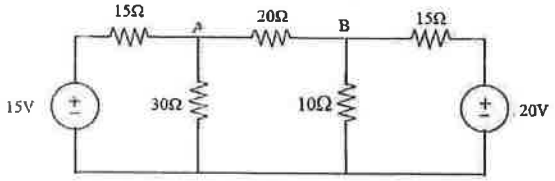
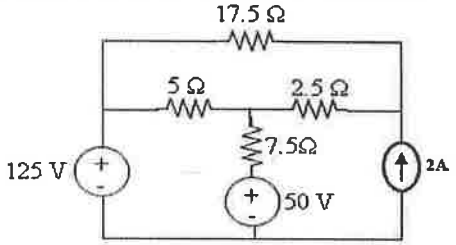
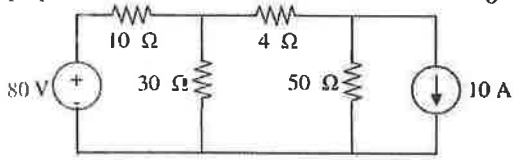
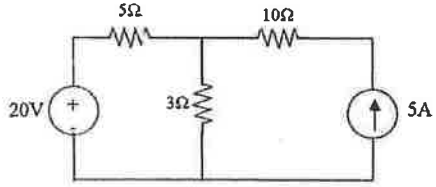
Q.P. Code: 20EE0250 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations Jan/Feb 2024
PRINCIPLES OF ELECTRICAL ENGINEERING
(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)	Determine the current in branch A-B by using KVL	L4	6M
				
	b)	Use KCL to find node voltages for the circuit shown below	L4	6M
				
		OR		
2	a)	Verify Superposition Theorem for 4Ω resistor for the following circuit.	L4	6M
				
	b)	By using superposition theorem find the current flowing through the 3 ohm resistor.	L2	6M
				

Q.P. Code: 20EE0250 R20

UNIT-II

3	a)	Define active power, apparent power, and reactive power.	L1	6M
	b)	Define power factor, admittance, and impedance	L1	6M
		OR		
4		A series RLC circuit of R=40 Ω, L= 50.07mH and a capacitor is connected across a 400V, 50Hz, A.C supply. This RLC combination draws a current of 10A.Calculate (i) Power factor of the circuit. (ii) Capacitor value.	L2	12M

UNIT-III

5		Explain the Constructional details of DC machine with neat sketch.	L1	12M
		OR		
6	a)	What is the necessity of speed control?	L2	6M
	b)	How to control the speed of DC. Shunt motor. Explain it with any one example.	L1	6M

UNIT-IV

7		Discuss Open Circuit and Short Circuit tests on single phase transformer	L1	12M
		OR		
8		Explain construction and Working Principle of 3-Ø Alternator.	L1	12M

UNIT-V

9	a)	Classify different types of measuring instruments.	L1	6M
	b)	Explain operating principles of Moving Iron and PMMC instruments	L2	6M
		OR		
10		Explain construction and principle of Moving Coil Voltmeter in detail.	L2	12M

Q.P. Code: 20HS0810 **R20**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations Jan/Feb 2024
COMMUNICATIVE ENGLISH
(EEE, ECE & MECH)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Bring out the central theme of the essay *Half a Rupee Worth.*	L3	12M
		OR		
2.	a)	Write a paragraph on *The benefits of having a pet.*	L3	6M
	b)	How do you differentiate Content words from function words? Give examples.	L2	6M

UNIT-II

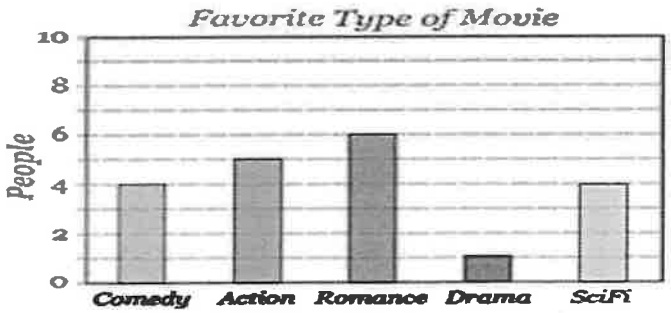
3.		Write an essay on *Thakur's well.*	L3	12M
		OR		
4.	a)	Describe Mechanics of Writing.	L2	6M
	b)	Define i. Self-confidence ii. Self-belief iii. Self-learning iv. Self motivation.	L2	6M

UNIT-III

5.	a)	How has been women portrayed by Kishwar Naheed in *I am not that Woman*	L5	6M
	b)	How do Emotional intelligence and Work efficiency play an important role in one's career?	L5	6M
		OR		
6.	a)	What are the steps involved in summarizing a text?	L5	6M
	b)	Write any six rules of agreement of the verb with the subject.	L2	6M

UNIT-IV

7.		Why does the author forget her name in "What is my Name?" Explain it.	L1	12M
		OR		
8.	a)	Study the given graph and write your interpretation in not more than 100 words.	L2	6M



	b)	Write the synonyms for the following words. i. Glad ii Enormous iii. Blend iv. Delicious v. sad vi. Adapt	L3	6M

UNIT-V

9.		What is the power of prayer according to A.P.J. Abdul Kalam?	L3	12M
		OR		
10.	a)	How do you give an effective oral presentation? Give some tips.	L3	6M
	b)	Write an essay on *Role of Media in building the society.*	L3	6M

Q.P. Code: 20CS0501 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations Jan/Feb 2024
C PROGRAMMING AND DATA STRUCTURES
(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.		Discuss about following operators. i. Arithmetic Operator. ii. Logical Operator. iii. Conditional Operator. iv. Increment/Decrement Operator. v. Assignment Operator.	L3	12M
		OR		
2.	a)	Discuss the below looping statements with example. i. While Loop. ii. For loop.	L3	6M
	b)	Write the syntax and illustrate goto, break and continue statements.	L2	6M

UNIT-II

3.		Define String. Explain the different string handling functions with example.	L3	12M
		OR		
4.	a)	Define recursion. Create a C program for factorial of a given number using function recursion.	L2	6M
	b)	Examine the types of storage class available in C.	L2	6M

UNIT-III

5.	a)	Explain the following with example i. malloc(), ii. calloc(), iii. realloc() and iv. free()	L5	6M
	b)	Define structure and give the general syntax for structure. Write a suitable example program.	L5	6M
		OR		
6.	a)	Define structure within a structure? Explain with an example.	L5	6M
	b)	Illustrate the use of typedef with suitable example.	L2	6M

UNIT-IV

7.		List the various operations that can be performed on stack? Explain with suitable example.	L1	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)	Explain briefly about various types of linked lists with suitable examples.	L3	6M

UNIT-V

9.		Define sorting. Explain any three sorting techniques with example.	L3	12M
		OR		
10.	a)	Explain selection sort. Sort the following numbers using selection sort : 24,9,29,14,19,27,50,10,30.	L3	6M
	b)	Explain the difference between merge sort and quick sort.	L3	6M

Q.P. Code: 20ME0353 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations Jan/Feb 2024
THERMAL AND FLUID ENGINEERING
(EEE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Explain briefly about cooling towers and Coal handling with neat diagram	L3	12M
		OR		
2.	a)	Explain the concept of pumped storage power plants.	L3	6M
	b)	Explain different types of thermodynamic systems?	L2	6M

UNIT-II

3.		Draw and explain a P.V, P-T and T-S diagram for a pure substance	L3	12M
		OR		
4.	a)	What is fusible plug? Draw the sketch and explain	L2	6M
	b)	What is the difference between super heater and air pre heater? Explain in detail with diagrams	L2	6M

UNIT-III

5.	a)	Write a short note on Vapour Pressure, surface tension and capillarity.	L5	6M
	b)	Write a short note on Piezometer with neat sketch?	L5	6M
		OR		
6.	a)	Derive an expression for surface tension inside the liquid droplet.	L5	6M
	b)	Derive an expression for capillary rise and fall in a glass tube.	L2	6M

UNIT-IV

7.		Formulate an expression for discharge measurement by Venturimeter.	L1	12M
		OR		
8.	a)	Derive an equation for Darcy Weisbach equation?	L2	6M
	b)	Explain about Energy gradient line and Hydraulic gradient line?	L3	6M

UNIT-V

9.		Explain the working of a Pelton wheel with a neat sketch .	L3	12M
		OR		
10.	a)	Derive an expression for the force exerted by a jet on fixed vertical flat plate.	L3	6M
	b)	A jet of 50 mm diameter delivers a stream of water at 20 m/s perpendicular to a plate that moves away from the jet 5 m/s. Find the force on the plate, work done and efficiency of jet.	L3	6M

Q.P. Code: 20EE0253 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations Jan/Feb 2024
PRINCIPLES OF ELCTRICAL CIRCUITS
(ECE)

Time: 3 Hours Max. Marks: 60

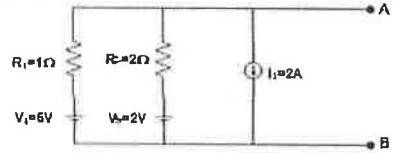
Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1. a) State and explain Ohm's law with limitations. L2 6M
   b) State and prove Kirchhoff's laws with suitable examples. L3 6M

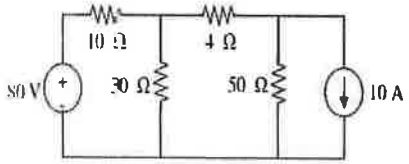
OR

2. a) Explain about source transformation briefly. L2 6M
   b) Determine the equivalent current source between the terminals A-B. L3 6M



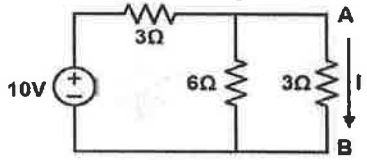
UNIT-II

3. Verify Superposition Theorem for 4Ω resistor for the following circuit. L3 12M



OR

4. a) State Compensation theorem. L3 4M
   b) Find the current passing through the branch AB using compensation theorem when the 3Ω resistance is changed to 9Ω. L3 8M



UNIT-III

5. a) A series RL circuit with R=30Ω and L= 15H has a constant voltage V=60v applied at t=0.Determine the current "I", voltage across resistor and voltage across inductor L4 6M
   b) A Series RL circuit with R=50Ω and L=10H has constant voltage V=100volts applied at t=0 by the closing the switch find the complete current. L4 6M

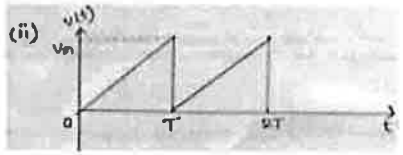
OR

6. a) Derive the Laplace Transform of Series RL Circuit.. L5 6M
   b) Derive the Laplace Transform of Series RC Circuit. L2 6M

Q.P. Code: 20EE0253 R20

UNIT-IV

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

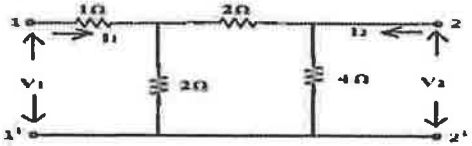


OR

8. a) Define active power and reactive power. L4 6M
   b) Explain the phasor relation for R, L & C elements. L4 6M

UNIT-V

9. a) Explain about h-parameters in terms of y-parameters. L2 6M
   b) Find the h-parameters of the network shown in figure. L2 6M



OR

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

Q.P. Code: 20EE0251 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations Jan/Feb 2024
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(MECH)

Time: 3 Hours Max. Marks: 60

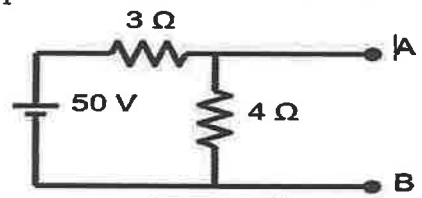
PART-A
(Answer all Three units, 3 x 10 =30 Marks)

UNIT-I

1.		Derive the expression of Star-Delta transformation and Delta to star transformation	L4	10M
		OR		
2.	a)	Write the derivation for equivalent resistance in series circuit.	L3	5M
	b)	A 5ohm , 10 ohm ,20 ohm, resistors are connected in series across 120V DC supply calculates Total Resistance, Total current, Voltage drop across each resistor.	L4	5M

UNIT-II

3.		Explain the principle and operation of DC generator.	L2	10M
		OR		
4.	a)	State Thevenin's theorem	L1	2M
	b)	Find the Thevenin's equivalent circuit across AB for the circuitshown.	L3	8M



UNIT-III

5.	a)	Derive EMF equation of a transformer	L3	6M
	b)	A 100 kVA, 11000/400 V, 50 Hz transformer has 40 secondary turns. Calculate the number of primary turns and primary and secondary currents.	L4	4M
		OR		
6.		Briefly discuss about various types of DC motors with neat sketches.	L1	10M

PART- B
(Answer all Three units, 3 x 10 =30 Marks)

UNIT-I

1.		Distinguish between intrinsic and extrinsic semiconductors and explain the process of conduction in each of them.	L2	10M
		OR		
2.	a)	Explain the working of a PN junction diode under forward and reverse bias.	L2	5M
	b)	Sketch the V-I Characteristics of a PN JunctionDiode.	L3	5M

UNIT-II

3.		Explain the Fixed Bias of a BJT with a neat diagram.	L2	10M
		OR		
4.	a)	Explain the construction of an NPN transistor and give the circuit symbols for NPN and PNP transistors.	L2	4M
	b)	If the base current in a transistor is 20μA when the emitter current is 6.4mA, what are the values of α and β? Also calculate the collector Current.	L4	6M

UNIT-III

5.	a)	Analyze the working condition of JFET working as a switch.	L4	5M
	b)	Explain the working principle of DMOSFET.	L2	5M
		OR		
6.	a)	Compare between BJT and JFET.	L4	5M
	b)	Explain working principle of EMOSFET with neat diagram.	L2	5M

Q.P. Code: 20EC0445 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester Supplementary Examinations Jan/Feb 2024
BASIC ELECTRONICS ENGINEERING
(CSE, CSM, CAD & CIA)

Time: 3 Hours Max. Marks: 60

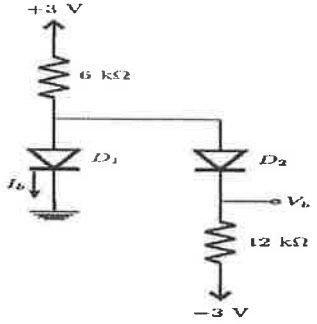
Answer one question from each unit **(5 x 12 = 60 Marks)**

UNIT-I

1.	a)	Explain drift current with expressions.	L2	6M
	b)	Explain diffusion current with expressions.	L2	6M
		OR		
2.	a)	Distinguish between intrinsic and extrinsic semiconductors and explain the process of conduction in each of them.	L2	8M
	b)	List the advantages of n-type over p-type semiconductors.	L2	4M

UNIT-II

3.	a)	List the applications of PN junction diode and Zener diode.	L1	6M
	b)	Define Breakdown voltage and draw the symbol of Zener Diode.	L1	6M
		OR		
4.	a)	A diode with saturation current $I_S = 2.32 \times 10^{-15}$ A conducts 0.36 mA when forward biased by 0.67 V. What current will it conduct if the bias is increased to 0.79 V? Assume room temperature T = 300 K and n =2.	L2	4M
	b)	For the following circuit, compute the values of the indicated voltages and currents (V_b and I_b) (i) using the ideal diode model with $V_D = 0$ V in forward bias. (ii) using the constant voltage drop diode model with $V_D = 0.7$ V in forward bias.	L3	8M



UNIT-III

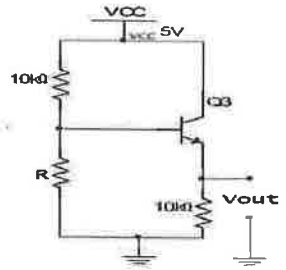
5.	a)	A half wave rectifier, having a resistive load of 1000Ω, rectifies an alternating voltage of 325V peak value and the diode has a forward resistance of 100Ω. Calculate (a)peak, average and rms value of current (b) dc power output (c) ac input power, and (d) efficiency of the rectifier.	L4	6M
	b)	A voltage of 200cosωt is applied to Half Wave Rectifier with load resistance of 5 kohm, find the maximum dc current, rms current and ripple factor.	L3	6M

OR

6.	a)	Draw the circuit diagram of a Full wave rectifier and with the help of waveforms describe its operation.	L1	6M
	b)	Derive the expressions for Average DC current, Average DC Voltage, RMS Value of Current, DC Power Output, AC Power input and Efficiency of a Full Wave Rectifier.	L3	6M

UNIT-IV

7.		For the following circuit, determine the value of resistor R so that $V_{out} = 2$V. Assume $\beta = 100$.	L5	12M



OR

8.	a)	Explain the Input and Output characteristics of a BJT in CE Configuration.	L2	6M
	b)	For a transistor, the leakage current is 0.1μA in CB configuration, while it is 19μA in CE configuration. Calculate α & β of the same transistor?	L3	6M

UNIT-V

9.		Determine the mode of operation (saturation, linear, or cut-off) and drain current I_D for NMOS, each of the biasing configurations given below. Use the following transistor data: NMOS: $k'_n = 150\mu A/V^2$, $V_{T0} = 0.5$ V. Assume $(W/L) = 1$. (i) NMOS: $V_{GS} = 2.5$ V, $V_{DS} = 2.5$ V. (ii) NMOS: $V_{GS} = 3.3$ V, $V_{DS} = 2.2$ V. (iii) NMOS: $V_{GS} = 0.6$ V, $V_{DS} = 0.1$ V.	L3	12M

OR

10.	a)	Explain the characteristics of N-channel Depletion type MOSFET under Enhancement mode.	L3	6M
	b)	List the types of JFET Biasing and Explain Briefly the setting of Operating Point.	L3	6M

Q.P. Code: 20ME0301 R20

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations Jan/Feb 2024

ENGINEERING GRAPHICS

(EEE, MECH & ECE)

Time: 3 Hours Max. Marks: 60

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

UNIT-I

1.		Construct a hypo cycloid of a circle of 50 mm diameter, which rolls inside another circle of 180 mm diameter for one revolution counter clockwise.	L3	12M
		OR		
2.	a)	Construct a parabola with base 120 and length of the axis 60 by using Rectangle method	L6	6M
	b)	Construct a parabola in a parallelogram of sides 100 x 60 with an included angle of 750.	L3	6M

UNIT-II

3.		Draw the projections of a straight line AB of 70 mm long, in the following positions: a) parallel to both HP and VP and 20 mm from each. b) Parallel to and 30 mm in front of VP and on HP c) Perpendicular to HP, 30 mm in front of VP & one end 25 mm above HP d) Perpendicular to HP, 30 mm in front of VP & one end on HP	L3	12M
		OR		
4.		Draw the projections of the following points, keeping the distance between the projectors as 25mm on the same reference lines. A – 20mm above HP and 30mm in front of VP B – 20mm above HP and 30mm behind VP C – 20mm below HP and 30mm behind VP D – 20mm below HP and 30mm in front of VP E – On HP and 30mm in front of VP F – On VP and 20mm above HP G – Lying on both HP and VP	L2	12M

UNIT-III

5.		A square plane ABCD of side 30mm is parallel to HP and 20mm away from it. Draw the projections of the plane, when (i) two of its sides are parallel to VP and (ii) one of its side is inclined at 30⁰ to VP.	L5	12M
		OR		
6.		A cone of diameter 50 mm and axis 60 mm has its generator in the VP and the axis is parallel to the HP. Draw its projections.	L6	12M

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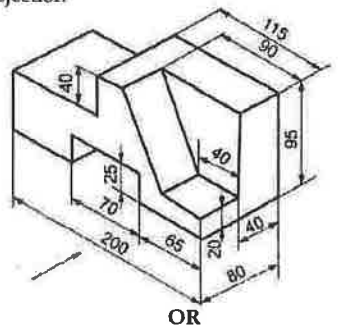
UNIT-IV

7.		A pentagonal pyramid, side of base 30 mm and height 52 mm, stands with its base on HP and an edge of the base is parallel to VP. It is cut by a plane perpendicular to VP, inclined at 40⁰ to HP and passing through a point on the axis, 32 mm above the base. Draw the development of the lateral surface of the truncated pyramid.	L1	12M
		OR		
8.		A square prism of side of base 40 mm and axis 80 mm long, is resting on its base on HP such that, a rectangular face of it is parallel to VP. Draw the development of the prism.	L2	12M

UNIT-V

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



OR

10.		Draw the isometric view of a cylinder of base diameter 50mm and axis 60 mm the axis of the cylinder is perpendicular to the HP.	L3	12M