Q.P. Code: 18HS0831

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester (R18) Supplementary Examinations Feb 2022
Mathematics-II
(Common To All)

Time: 3 hours   Max.Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following: (5 X 2 = 10 Marks)

(a)	Verify the Exactness of $(2x - y + 1)\,dx + (2y - x - 1)\,dy = 0$	L2	2M
(b)	Find Particular Integral of $(D^2 + 6D + 9)y = 2e^{-3x}$	L1	2M
(c)	Evaluate $\int_0^1 \int_0^x e^{x+y}\,dx\,dy$.	L2	2M
(d)	Define Bilinear Transformation.	L1	2M
(e)	State Cauchy's theorem.	L3	2M

PART-B

(Answer all five units, 5 x 10 =50 Marks)

UNIT - I

2. (a)	Solve $\dfrac{dy}{dx} + \dfrac{y\cos x + \sin y + y}{\sin x + x\cos y + x} = 0$.	L3	5M
(b)	Solve $y(2x^2y + e^x)dx = (e^x + y^3)dy$.	L3	5M

OR

3. (a)	Solve $(x + 1)\dfrac{dy}{dx} - y = e^{3x}(x + 1)^2$.	L2	5M
(b)	Solve $\dfrac{dy}{dx}(x^2y^3 + xy) = 1$.	L2	5M

UNIT - II

4.	Solve in series the equation $\dfrac{d^2y}{dx^2} + xy = 0$	L2	10M

OR

5.	Prove that $J_{3/2}(x) = \dfrac{3}{x}\left[\sqrt{\dfrac{2}{\pi x}}\left(\dfrac{\sin x}{x} - \cos x\right)\right] - \sqrt{\dfrac{2}{\pi x}}\sin x$	L5	10M

UNIT - III

6. (a)	Evaluate $\int_0^5 \int_0^{x^2} x(x^2 + y^2)dxdy$	L3	5M
(b)	Evaluate $\iint(x^2 + y^2)dxdy$ in the positive quadrant for which $x + y \le 1$.	L3	5M

OR

7. (a)	Find the area of the ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$.	L1	5M
(b)	Evaluate $\int_0^{\pi}\int_0^{a(1+\cos\theta)} r\,dr\,d\theta$	L3	5M

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UNIT - IV

8. (a)	Show that $u = \tfrac{1}{2}\log(x^2 + y^2)$ is Harmonic.	L4	5M
(b)	Find the analytic function whose imaginary part is $e^x(x\sin y + y\cos y)$.	L1	5M

OR

9. (a)	Show that $f(z) = z + 2\bar{z}$ is not analytic anywhere in the complex plane.	L2	5M
(b)	Show that $\dfrac{\partial^2}{\partial x^2} + \dfrac{\partial^2}{\partial y^2} = 4\dfrac{\partial^2}{\partial z\partial \bar{z}}$.	L2	5M

UNIT - V

10. (a)	Find the residue of the function $f(z) = \dfrac{1}{(z^2 + 4)^2}$ where c is $|z - i| = 2$	L2	5M
(b)	Determine the poles of the function $f(z) = \dfrac{z^2}{(z-1)^2(z+2)}$ and the residues at each pole.	L2	5M

OR

11.	Evaluate $\displaystyle\int_0^{\pi} \dfrac{1}{a + b\cos\theta}\,d\theta = \dfrac{\pi}{\sqrt{a^2 - b^2}}, a > b > 0$	L3	10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester (R18) Supplementary Examinations February 2022
CHEMISTRY
(Common to CE,ME & EEE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)

(a)	Write Schrodinger wave equation.	L1	2M
(b)	Define cell potential.	L1	2M
(c)	Define hard water and soft water.	L1	2M
(d)	Name the reactants used in the preparation of paracetamol and aspirin.	L1	2M
(e)	What are the differences between atomic and molecular spectroscopy	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.	Derive Schrodinger wave equation for the wave mechanical model of an atom. Give the significance of wave function.	L6	10M

OR

3.	Explain the crystal field splitting of orbital's in octahedral, tetrahedral and square planar fields in complexes	L3	10M

UNIT – II

4.	Define cell potential. Derive Nernst equation for the calculation of cell emf. What are its applications	L6	10M

OR

5.	Discuss in detail about electrochemical or wet corrosion?	L5	10M

UNIT - III

6.	Describe the estimation of hardness by EDTA method.	L2	10M

OR

7.	Describe the Zeolite or permutit process for softening of water. What are the advantages and disadvantages of zeolite process?	L2	10M

UNIT – IV

8.	Define conducting polymers. Distinguish between thermoplastics & thermosetting plastics.	L5	10M

OR

9.	Explain the synthesis of Paracetamol and Aspirin.	L6	10M

UNIT – V

10.	Explain principle and instrumentation of UV-visible spectroscopy	L6	10M

OR

11.	Explain principle, instrumentation and its applications of Scanning Electron microscopy (SEM)	L6	10M

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SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester (R18) Supplementary Examinations February 2022
Semiconductor Physics
(Common to ECE and CSE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)

(a)	Define Fermi level.	L1	2M
(b)	Define drift and diffusion phenomena.	L4	2M
(c)	What is meant by avalanche?	L1	2M
(d)	Mention the conditions to be satisfied for light to undergo total internal reflection.	L1	2M
(e)	Give the industrial applications of nanomaterials.	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)

UNIT – I

2.	(a)	Distinguish between direct and indirect band gap semiconductors.	L3	5M
	(b)	Explain the creation of energy bands in solids.	L2	5M

OR

3.	(a)	Explain different Brillouin zones using E-K diagram	L3	5M
	(b)	Give a note on effective mass.	L1	5M

UNIT – II

4.	(a)	Explain the dependence of Fermi level on carrier concentration and temperature.	L2	7M
	(b)	Distinguish between n-type and p-type semiconductors.	L2	3M

OR

5.	(a)	Explain Hall effect. Give its applications.	L3	7M
	(b)	The hall coefficient of a specimen is $3.66\times10^{-4}\,m^3c^{-1}$. Its resistivity is $8.93\times10^{-3}\,\Omega m$. Find μ and n.	L5	3M

UNIT – III

6.	(a)	Give a note on Radioactive and non-radioactive recombination mechanisms in semiconductors.	L1	7M
	(b)	Give the Applications of LED.	L1	3M

OR

7.	Describe the working of Solar cell with I-V characteristics.	L3	10M

UNIT – IV

8.	(a)	Describe the construction and working of semiconductor laser.	L2	7M
	(b)	Mention the applications of lasers in medicine.	L1	3M

OR

9.	(a)	Obtain an expression for Numerical Aperture of an optical fiber.	L2	7M
	(b)	Calculate the acceptance angle of a given optical fiber, if the refractive indices of the core and cladding are 1.563 and 1.498 respectively.	L5	3M

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UNIT – V

10.	(a)	Give a note on Quantum dot, quantum well and quantum wire.	L1	6M
	(b)	Explain quantum confinement.	L2	4M

OR

11.	(a)	Describe Ball Milling technique of nanomaterial's synthesis.	L4	7M
	(b)	Mention the properties of Grapheme.	L1	3M

Q.P. Code: 18CS0501   **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester (R18) Supplementary Examinations FEB 2022
PROGRAMMING FOR PROBLEM SOLVING
(CSE & ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)

(a)	Describe types of software.	L2	2M
(b)	Define Array	L1	2M
(c)	What is Recursive Function?	L1	2M
(d)	Explain Pointer with Syntax	L2	2M
(e)	Write File Operations	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.	With a neat diagram, illustrate different types of computers. explain the basic structure of a computer?	L4	10M

OR

3.	Analyze various Arithmetic Operators in detail with examples	L4	10M

UNIT – II

4.	Develop a C program to generate the Pascal triangle.	L3	10M

OR

5.	Explain the different types of loops in C with syntax.	L2	10M

UNIT – III

6.	What is function? Explain different classification of user defined functions based on parameter passing and return type with examples	L1	10M

OR

7.	Write a Program to find the largest element in an array?	L3	10M

UNIT – IV

8.	Describe string manipulation library functions with their syntaxes. Write a program to check whether a string is palindrome or not.	L3	10M

OR

9.	Write a C program to read lines of text from the keyboard count and display the occurrence of a particular word in that text?	L3	10M

UNIT – V

10.	Define structure? Explain C syntax of structure declaration with example.	L1	10M

OR

11.	Write a C Program to read the input file from command prompt, using command line arguments.	L3	10M

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SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR

(AUTONOMOUS)

B.Tech I Year II Semester (R18) Supplementary Examinations FEB 2022

ENGINEERING GRAPHICS & DESIGN

(CE,EEE & MECH)

Time: 3 hours   Max.Marks: 60

PART-A

(Compulsory Questions)

Answer the following: (5 X 2 = 10 Marks)

1.
(a) Draw a regular pentagon of side 30mm in any method   1.1   2M
(b) Differentiate between first angle and third angle projection   1.4   2M
(c) Draw the projections of the square of 40 mm side, plane is parallel to HP and
    perpendicular to VP   1.3   2M
(d) Define frustum   1.1   2M
(e) Draw the isometric view of circle of 40 mm diameter   1.2   2M

PART- B

(Answer all five units, 5 x 10 =50 Marks)

UNIT – I

2. 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.   1.3   10M

OR

3. a) Inscribe an ellipse in a parallelogram having sides 150 mm and 100 mm
      long and an included angle of 120°.   1.3   5M
   b) Construct a parabola with base 60 mm and length of the axis 40 mm.
      Draw a tangent to the curve at point 20 mm from the base. Also locate the
      focus and directrix to the parabola.   1.2   5M

UNIT – II

4. A point A is 20 mm above the HP and 50 mm in front of the VP. Another
   point B is 40 mm below the HP and 15 mm behind the VP. The distance
   between the projectors of the points, measured parallel to XY is 75 mm.
   Draw the projections of the points. Draw lines joining their FVs and TVs.   1.2   10M

OR

5. A line AB, 50mm long. The line is inclined to the HP at 30 degree and to
   the VP at 45 degree. Draw the projections if end A is 15mm above the HP
   and 20 mm in front of the VP.   1.3   10M

UNIT – III

6. A regular hexagonal plane of 45 mm side has a corner on HP, and its
   surface is inclined at 45 degree to HP. Draw the projections, when the
   diagonal through the corner, which is on HP makes 30 degree with VP   1.1   10M

OR

7. A pentagonal prism of base side 30 mm and axis 60 mm has one of its
   rectangular faces on the HP and the axis inclined at 60 degree to the VP.
   Draw its projections.   1.3   10M

UNIT – IV

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8. A cube of side 40 mm, is resting on HP on one of its faces, with a vertical
   face inclined at 30 degree to VP. It is cut by a section plane inclined at 45
   degree to HP and passing through the axis at 8 mm from the top surface.
   Draw the projections of the solid and also show the true shape of the
   section.   1.2   10M

OR

9. A cylinder of diameter of base 40 mm and axis 55 mm long, is resting on its
   base on HP. It is cut by a section plane, perpendicular to VP and inclined at
   45 degree to HP. The section plane is passing through the top end of an
   extreme generator of the cylinder. Draw the development of the lateral
   surface of the cut cylinder.   1.2   10M

UNIT – V

10. Draw the isometric view of a cylinder of base diameter 50 mm and axis
    60 mm the axis of the cylinder is perpendicular to the
    (a) HP
    (b) VP   1.1   10M

OR

11. Draw three views of the blocks shown pictorially in figure according to
    first angle projection   1.4   10M

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SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester (R18) Supplementary Examinations FEB 2022
ENGINEERING MECHANICS
(ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following: (5 X 2 = 10 Marks)

     (a) State parallelogram law of forces.   L1   2M
     (b) State laws of friction.   L1   2M
     (c) What is the importance of center of gravity?   L1   2M
     (d) Define Moment of Inertia.   L1   2M
     (e) List out the types of Trusses   L1   2M

PART-B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.   (a) Classify different system of forces with suitable examples.   L2   5M
     (b) The resultant of the two forces, when they act at an angle of 60o is 14 N. If   L3   5M
          the same forces are acting at right angles, their resultant is √137 N.
          Determine the magnitude of the two forces.

OR

3.   A beam ABCDE hinged at A and supported on rollers at D, is loaded as shown
     in Fig. Find the reactions at A and D.

UNIT – II

4.   Find the least force required to drag a body of weight 'W' placed on a rough   L3   10M
     inclined plane having inclination 'α' to the horizontal. The force is applied to
     the body in such a way that it makes an angle 'O' to the inclined plane and the
     body is on the point of motion up the plane.

OR

5.   A ladder of length 4 m, weighing 200 N is placed against a vertical wall as   L3   10M
     shown in Fig.10. The coefficient of friction between the wall and the ladder is
     0.2 and that between floor and the ladder is 0.3. The ladder, in addition to its
     own weight, has to support a man weighing 600 N at a distance of 3 m from A.
     Calculate the minimum horizontal force to be applied at A to prevent slipping.

UNIT – III

6.   A semicircle of 90 mm radius is cut out from a trapezium as shown in Fig.Find   L3   10M
     the position of the Centre of gravity of the figure.
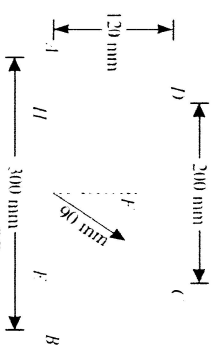
7.   Find the center of gravity of a channel section 100 mm × 50 mm × 15 mm as   L3   10M
   shown in Fig

OR

UNIT – IV
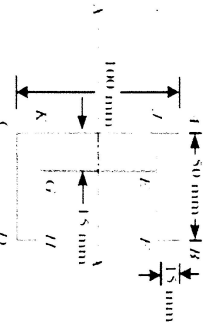
8.   Prove the parallel axis theorem in the determination of moment of inertia of   L2   10M
     areas with the help of a neat sketch.

OR

9.   An I-section is made up of three rectangles as shown in Fig. Find the   L3   10M
     Moment of Inertia of the section about the horizontal axis passing through the
     center of gravity of the section.

UNIT – V
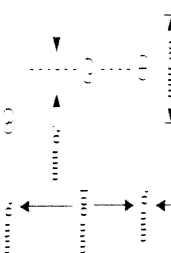
10. Find the forces in the members of a truss as shown in fig.   L3   10M
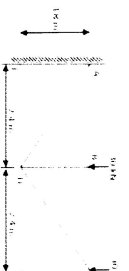
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SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester (R18) Supplementary Examinations February 2022
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(CIVIL)

Time: 3 hours 　　　　　　　　　　　　　　　　　　　　　　　Max.Marks: 60

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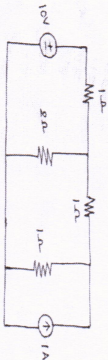### UNIT - I

1. Explain the following networks
   (a) Resistive networks 　　　　　　　　　　　　　　　　　　L1　5M
   (b) Inductive networks 　　　　　　　　　　　　　　　　　　L1　5M

OR

2. (a) Explain the Capacitive networks. 　　　　　　　　　　　L1　5M
   (b) Define and Explain about ohms law. 　　　　　　　　　　L1　5M

UNIT - II

3. (a) State super position theorem. 　　　　　　　　　　　　　L1　2M
   (b) Calculate the current in 2Ω resistor in the fig. using super position theorem 　L1　8M

OR

4. (a) State Norton's theorem. 　　　　　　　　　　　　　　　　2M
   (b) Find Norton's equivalent circuit across AB for the circuit shown in below. 　8M
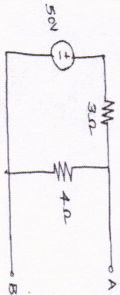
UNIT - III

5. (a) Derive Torque equation of dc motor. 　　　　　　　　　　5M
   (b) The counter emf of Shunt motor is 227 volts the field resistance is 160Ω and field current 1.5A if the line current is 36.5A find the armature resistance also find armature current when the motor is stationary. 　5M

OR

6. A 220V shunt motor takes a total current of 80A and runs at 800 r.p.m .Shunt field resistance and armature resistance are 50Ω and 0.1Ω respectively. If iron and friction losses amount to 1600W. find (i)Copper losses (ii)Armature torque (iii)Shaft torque (iv)Efficiency. 　10M

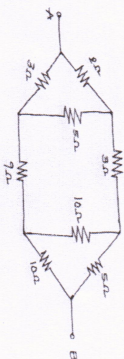## PART-B
(Answer all Three units, 3 x 10 =30 Marks)
UNIT - I

1. The current delivered by the source for the circuit shown in figure. 　10M
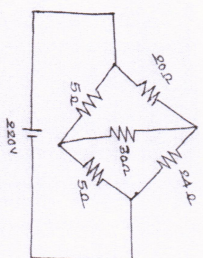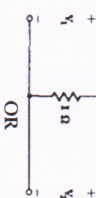

OR

2. Find the voltage to be applied across AB in order to drive a current of 5A into the circuit. 　10M

UNIT - II

3. Find the Open circuit parameters for the circuit shown in figure. 　10M

OR

4. The given Y-parameters are $Y_{11}=0.5, Y_{12}=Y_{21}=0.6, Y_{22}=0.9$ find impedance parameters. 　10M

UNIT - III

5. A 220V shunt motor takes a total current of 70A and runs at 900 r.p.m .Shunt field resistance and armature resistance are 40Ω and 0.2Ω respectively. If iron and friction losses amount to 1700W. find (i)Copper losses (ii)Armature torque (iii)Shaft torque (iv)Efficiency. 　10M

OR

6. (a) Explain principle of operation of transformer 　　　　　5M
   (b) An ideal transformer has 1000 turns on its primary and 500 turns on its secondary the driving voltage of primary side is 100V and the load resistance is 5 Ω, calculate V_2, I_1 and I_2. 　5M

Q.P. Code: 18EE0201

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SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester (R18) Supplementary Examinations Feb 2022
ELECTRICAL CIRCUITS-I
(EEE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

Answer the following: (5 X 2 = 10 Marks)

1.	(a)	Define mesh and super mesh.	L1 2M
	(b)	What is power factor?	L1 2M
	(c)	What is the condition for maximum power transfer in a circuit.	L1 2M
	(d)	Define band width.	L1 2M
	(e)	What is self and mutual inductance.	L1 2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2. What are the types of sources? Explain in detail them with suitable diagrams and Characteristics?   L2   10M

OR

3. (a) Three resistances 2Ω , 4Ω and 6Ω are connected in series across a voltage supply voltage across 2 Ω resistor is 4V. Find the voltage across remaining resistances and total voltage.   L5   5M

(b) Find the current supplied by 10V battery by using star-Delta transformation.   L5   5M
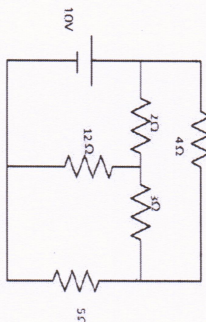
UNIT – II

4. Derive an expression for the current, impedance, average power for a series RC circuit excited by a sinusoidally alternating voltage and also and the power factor of the circuit. Draw the phasor diagram.   L4   10M

OR

5. A 50Ω resistor is connected in series with a 25µF Capacitor across a 230V, 50HZ AC Supply. Find
(i) Capacitive reactance
(ii) Impedance
(iii) Current
(iv) Phase angle
(v) Voltage drop across resistance.   L5   10M

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UNIT – III

6. (a) State and explain Norton's theorem.   L2   5M
(b) State and explain Superposition theorem.   L2   5M

OR

7. Using Thevenin's theorem find current in the network   L5   10M
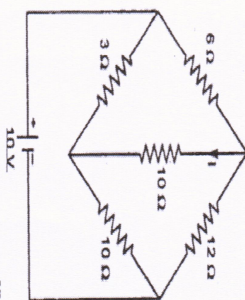
UNIT – IV

8. Show that the locus of the current in an R-L circuit with R variable is a semicircle. Find the radius and the center of the circle.   L4   10M

OR

9. (a) Draw and explain locus diagram of RC parallel circuit?   L2   5M
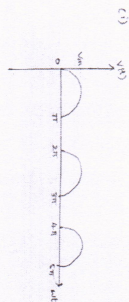(b) Draw and explain locus diagram of RL parallel circuit?   L2   5M

UNIT – V

10. (a) Define and explain self – inductance and mutual – inductance.   L2   5M
(b) Two coupled coils of L1 = 0.8 H and L2 = 0.2 H have a coupling coefficient k = 0.9. Find the mutual inductance M.   L5   5M

OR

11. Explain in detail about Statically Induced EMF and Dynamically Induced EMF?   L2   10M

Q.P. Code: 18EE0239   R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester (R18) Supplementary Examinations February 2022
BASIC ELECTRICAL ENGINEERING
(Common to CSE & ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)
Answer the following: (5 X 2 = 10 Marks)

1.
(a) A electric kettle takes a current of 12.5A at 240V. What is the resistance of heating   L1   2M
    Element ?
(b) Define resonance?   L1   2M
(c) Why Transformer doesn't work on DC?   L1   2M
(d) What is commutation & commutator?   L1   2M
(e) Define Fuse and Circuit Breaker?   L1   2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT - I

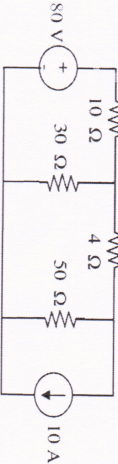2. Determine the mesh currents for the circuit shown below.   L3   10M
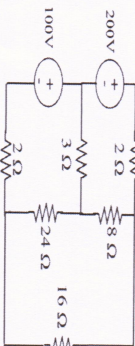
OR

3.
a) State and explain Superposition theorem?   L1   4M
b) Verify Superposition theorem for 4Ω resistor for the following circuit.   L4   6M

UNIT - II

4.
a) Explain parallal RL and RC circuits with phasor diagrams.   L2   6M
b) A 120V AC circuit contain 10 Ω resistance and 30 Ω inductive reactance in   L2   4M
    series. What is average power of this circuit.

OR

5.
a) Derive the voltage and current relations in three phase balanced circuits for star   L2   6M
    connection.
b) Find the rms value for the following waveforms   L3   4M

Q.P. Code: 18EE0239   R18

UNIT - III

6.
a) Explain the various losses in a transformer.   L1   5M
b) a single phase transformer with a ratio of 440/110V takes a no load current of   L3   5M
    5A at 0.2 p.f. lagging. If the secondary supplies a current of 120A at a p.f. of 0.8
    lagging,find the current taken by the primary.

OR

7. What are three phase transformer connections and explain it?   L3   10M

UNIT - IV

8. Sketch and explain the torque slip characteristics of 3 phase induction motor?   L2   10M

OR

9. Explain the working principle of synchronous generator?   L2   10M

UNIT - V

10. With relevant diagrams explain in detail about various types of fuses used in   L2   10M
    electrical wiring systems.

OR

11. Explain about   L2   10M
    a) pvc cables and b) wheather proof cables

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester (R18) Regular Examinations February 2022
ENTREPRENEURSHP DEVELOPMENT
(Common to ECE,CSE,CIVIL & MECH)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)
Answer the following; (5 X 2 = 10 Marks)

1.
(a)	Define Women Entrepreneur	L1	2M
(b)	What is leasing	L2	2M
(c)	Outline the Trade mark	L3	2M
(d)	Define venture Capital	L1	2M
(e)	Write short note on Product life cycle	L3	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.	(a)	Briefly explain various types of entrepreneurs.	L3	5M
	(b)	Differentiate between entrepreneur and manager.	L2	5M

OR

3.	Discuss Challenges faced by entrepreneurs in India	L1	10M

UNIT – II

4.	Examine the role of government in supporting MSMEs in India	L3	10M

OR

5.	Explain Types of Business organizes in detail	L3	10M

UNIT – III

6.	Justify the concept of Innovation and explain its types	L5	10M

OR

7.	What are the sources of information for starting a business?	L5	10M

UNIT – IV

8.	Discuss various Motivational theories in detail	L3	10M

OR

9.	What are the various sources of finance for entrepreneurs in India?	L5	10M

UNIT – V

10.	Define project Management? Determine the stages of project management process.	L3	10M

OR

11.	Describe about Project post Feasibility analysis	L4	10M

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech IV Year I Semester (R18) Regular Examinations February 2022
SOFTWARE DEVELOPMENT & TESTING
(Common to ECE,EEE & MECH)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)
Answer the following: (5 X 2 = 10 Marks)

1.	(a)	Analyse the changing nature of software.	L1 2M
	(b)	Describe Quality attributes of Design Process?	L1 2M
	(c)	Compare Content architecture and Web App architecture.	L1 2M
	(d)	Define 'verification and validation?	L1 2M
	(e)	What is the purpose of test debugging?	L1 2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.	(a)	Determine essence of practice in software engineering.	L3 5M
	(b)	Define the term Software Engineering and Explain about A Layered Technology	L1 5M

OR

3.	(a)	List out general principles of software engineering.	L1 5M
	(b)	Describe practitioners myths?	L1 5M

UNIT – II

4.	(a)	List various analysis rules of thumb in requirement analysis?	L1 5M
	(b)	Explain elements of requirements model?	L1 5M

OR

5.	(a)	Discus briefly about software architectural patterns.	L2 5M
	(b)	Demonstrate types of Architectural styles briefly.	L3 5M

UNIT – III

6.	(a)	Describe the steps involved in Web App Interface Design.	L6 5M
	(b)	What are the different design tasks focused.	L2 5M

OR

7.	(a)	Explain golden rules to form the basis for a set of user interface design principles.	L2 5M
	(b)	Manipulate various steps of Interface Design.	L3 5M

UNIT – IV

8.	(a)	Illustrate Testing Strategies for Object Oriented software?	L3 5M
	(b)	Describe about module testing?	L2 5M

OR

9.	(a)	Explain about the importance of test strategies in conventional software?	L2 5M
	(b)	Describe briefly about White box testing?	L1 5M

UNIT – V

10.	(a)	Explain advantages and disadvantages of software quality assurance?	L3 5M
	(b)	Elaborate test case design techniques?	L2 5M

R18

OR

11.	(a)	Discuss about software testing lifecycle?	L4 5M
	(b)	Summarize case study on automation tools?	L2 5M

R19

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
I B.Tech II SEM (R19) Supplementary Examinations of Feb 2022
Applied Chemistry
(CSE)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)

(a)	Define the Nernst equation.	L1	2M
(b)	What is the significance of Ψ and Ψ^2.	L1	2M
(c)	Define functionality of monomer.	L1	2M
(d)	What is the Electromagnetic spectrum.	L1	2M
(e)	Define cation binding.	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2. Define Conductometric titrations. Discuss all types of Acid-Base Conductometric titrations.   L1   10M

OR

3. (a) Explain the Working of Methanol – Oxygen Fuel cell .   L2   5M
   (b) Discuss the Working of H_2-O_2 Fuel cell.   L2   5M

UNIT – II

4. Discuss the energy level diagrams of O_2 and N_2 molecules.   L2   10M

OR

5. What are the crystal field theory salient features and draw the splitting in tetrahedral complexes.   L1   10M

UNIT – III

6. Distinguish the Thermoplastics and Thermo settings.   L2   10M

OR

7. Explain the following mechanism with examples.
   (i) Condensation or Step growth polymerization .   (ii)   Co-polymerization.   L2   10M

UNIT – IV

8. Give an account on principle and instrumentation of IR spectroscopy. Explain stretching and bending vibrations.   L2   10M

OR

9. Explain the principle and instrumentation of Gas Chromatography.   L2   10M

UNIT – V

10. Discuss the brief note on Fullerenes and Carbon nano tubes   L2   10M

11. Explain in detail about principle and application of semiconductors.   L2   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb 2022
SEMICONDUCTOR PHYSICS
(ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	What is effective mass and develop an expression for effective mass of an electron in periodic potential field	L3	8M
	b)	Classify the materials into conductors, semiconductors, and insulators based on band theory.	L2	4M

OR

2	a)	Summarize the electrical conductivity in metal using quantum free electronic theory.	L2	8M
	b)	Calculate relaxation time of conduction electron in metal if its resistivity is 1.55×10^{-8} Ωm and it has 5.82×10^{28} conduction electron/m^3 Given m=9.1×10^{-31} kg, e=1.6×10^{-19} C.	L3	4M

UNIT-II

3	a)	Differentiate intrinsic and extrinsic semiconductors.	L2	8M
	b)	Explain the formation of pn-junction.	L2	4M

OR

4	a)	Describe the construction and working mechanism of LED with neat diagram.	L2	7M
	b)	List the applications of Hall effect.	L1	5M

UNIT-III

5	a)	What are matter waves? Derive an expression for de-Broglie's wavelength of an electron	L3	6M
	b)	Find the de-Broglie wavelength of a neutron whose kinetic energy is two times of the rest mass of the electron. Given $m_n = 1.67 \times 10^{-27}$ kg, $m_e = 9.1 \times 10^{-31}$ kg and h = 6.63×10^{-34} Js.	L1	6M

OR

6	a)	Write the significance of divergence and curl of an electromagnetic fields	L1	6M
	b)	An electron bound in a one-dimensional box having a width of 4×10^{-10} m. What will be minimum energy and second excited-state energy in eV.	L1	6M

UNIT-IV

7	a)	Outline the important characteristics of laser.	L1	4M
	b)	Explain the construction and working principle of Nd:YAG laser with neat energy level diagram.	L2	8M

OR

8	a)	Distinguish between step index and graded index fibers.	L4	6M
	b)	List the applications of optical fibers.	L1	6M

UNIT-V

9	a)	What is nanomaterial? Explain the basic principle of nanomaterials.	L2	8M
	b)	State the techniques available for synthesizing nanomaterials.	L1	4M

OR

10	a)	Describe the ball milling technique for the synthesis of nanomaterial.	L1	6M
	b)	Recall the applications of nanomaterials in various fields.	L1	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb 2022
Engineering Chemistry
(CE&ME)

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

UNIT-I

1		What is meant by hardness of water? Describe the estimation of hardness of water by EDTA method.	L3	12M

OR

2	a)	Explain the sludge's and scales	L3	6M
	b)	Define demineraliation. Explain the demineralization of brackish water by reverse osmosis.	L2	6M

UNIT-II

3		What is fuel cell? Describe the construction and working of Hydrogen-Oxygen fuel cell.	L3	12M

OR

4	a)	Explain any six factors influencing the rate of corrosion.	L2	6M
	b)	Write short note on sacrificial anodic protection.	L2	6M

UNIT-III

5	a)	What is functionality of monomer?	L5	6M
	b)	Write the preparation, properties and uses of Buna-S, Buna-N rubbers.	L5	6M

OR

6	a)	Write a note on octane value and Cetane value.	L5	6M
	b)	Explain the proximate analysis of coal with its significance.	L2	6M

UNIT-IV

7		Define cement. Explain in detail about manufacture of cement.	L1	12M

OR

8	a)	Write short note on refractoriness.	L2	6M
	b)	Write short note on Flash point and Fire point.	L3	6M

UNIT-V

9		Write any two methods of synthesis of colloids with suitable example.	L3	12M

OR

10	a)	Write brief note on applications of nanomaterials.	L3	6M
	b)	Write brief note on Micelle formation.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb 2022
DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS
(Common to CE, ME, EEE & ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

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

  (b) Solve $\dfrac{d^2y}{dx^2} + 2y = x^3 + e^{-2x} + \cos 3x$.   L2   6M

OR

2 (a) Solve $\dfrac{d^2y}{dx^2} - 6\dfrac{dy}{dx} + 25y = e^{2x} + \sin x + x$.   L3   6M

  (b) Solve $\dfrac{dy}{dx} + x\sin 2y = x^3\cos^2 y$.   L2   6M

UNIT-II

3 Solve by method of variation of parameters $\dfrac{d^2y}{dx^2} + 4y = \tan 2x$.   L3   12M

OR

4 (a) Solve $x^2\dfrac{d^2y}{dx^2} - 2x\dfrac{dy}{dx} + 2y = 4x^3$.   L2   6M

  (b) Solve $(x+1)^2\dfrac{d^2y}{dx^2} + (x+1)\dfrac{dy}{dx} + y = 2\sin\left[\log(x+1)\right]$.   L2   6M

UNIT-III

5 (a) Form the partial differential equation by eliminating 'f' and 'g' from $z = f(x+it) + g(x-it)$, where $i = \sqrt{-1}$.   L5   6M

  (b) Solve the PDE $(x^2 - yz)p + (y^2 - zx)q = (z^2 - xy)$.   L5   6M

OR

6 Solve the by the method of separation of variables $\dfrac{\partial u}{\partial x} = 4\dfrac{\partial u}{\partial y}$ and $u(0,y) = 8e^{-3y}$.   L5   12M

UNIT-IV

7 (a) Find the directional derivative of the function $f = x^2 - y^2 + 2z^2$ at the point P(1,2,3) in the direction of the line PQ where Q(5,0,4).   L1   6M

  (b) Show that $\overline{F} = (x^2 - yz)i + (y^2 - zx)j + (z^2 - xy)k$ is Conservative vector field and find its Potential function.   L5   6M

OR

8 (a) Find $Div\,\overline{F}$ and $Curl\,\overline{F}$ where $\overline{F} = grad\left(x^3 + y^3 + z^3 - 3xyz\right)$.   L2   6M

  (b) Show that $\nabla^2 f(r) = \dfrac{d^2 f}{dr^2} + \dfrac{2}{r}\dfrac{df}{dr}$ where $r^2 = x^2 + y^2 + z^2$.   L3   6M

UNIT-V

9 Verify Stoke's theorem for $\overline{F} = (x^2 + y^2)i - 2xy\, j$ taken around the rectangle bounded by the lines $x = \pm a$ and $y = \pm b$.   L3   12M

OR

10 Verify divergence theorem for $\overline{F} = (x^2 - yz)i + (y^2 - zx)j + (z^2 - xy)k$ taken over the rectangular parallelepiped $0 \le x \le a, 0 \le y \le b, 0 \le z \le c$.   L3   12M

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SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb 2022
PROBABILITY & STATISTICS (19HS0835)
(CSE)

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

UNIT-I

1   (a)   Determine the probability of the following event : A non-defective bolt will be found if out of 600 bolts already examined, 12 were defective.   L3   6M

    (b)   Three machines A, B and C produce respectively 50%, 30% and 20% of the total number of items of a factory. The percentages of defective output of these machines are 3%, 4% and 5%. If an item is selected at random, find the probability that the item is defective.   L2   6M

OR

2   (a)   A random variable X has the following probability function :   L3   6M
Values of X,

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

(i) Determine the value of a,
(ii) Evaluate $p(X < 3), p(X \geq 3), p(2 \leq X < 5)$.

    (b)   If X is a continuous random variable with probability density function given by $f(x) = \begin{cases} kx & if\ 0 \leq x \leq 2 \\ 2k & if\ 2 \leq x \leq 4 \\ -kx + 6k & if\ 4 \leq x \leq 6. \end{cases}$ L2   6M

(i). find k
and (ii).the distribution function $F(x)$.

UNIT-II

3   (a)   Find the mean and variance of Binomial distribution.   L3   6M
    (b)   Calculate the mean and standard deviation of a normal distribution in which 31% are under 45 and 8% are over 64.   L2   6M

OR

4   (a)   If the probability of a bad reaction from a certain injection is 0.001.Determine the chance that out of 2000 individuals more than two will get a bad reaction.   L2   6M

    (b)   Out of 800 families with 4 children each, how many families would be expected to have (i) 2 boys and 2 girls (ii) at least one boy (iii) no girl   (iv) at most two girls? Assume equal probabilities for boys and girls.   L2   6M

UNIT-III

5   (a)   Find the mean ,median and mode of the following date   L5   6M

Mid value	15	20	25	30	35	40	45	50	55
Frequency	2	22	19	14	3	4	6	1	1

    (b)   Two random variables have the regression lines with equations $3x + 2y = 26$ and $6x + y = 31$.Find the means values and the correlation co-efficient between x and y .   L5   6M

OR

6   (a)   Obtain the correlation coefficient for the following data :   L5   6M

x	48	60	72	62	56	40	39	52	30
y	62	78	65	70	38	54	60	32	31

  (b)   Explain the Skewness and Kurtosis.   L2   6M

UNIT-IV

7   Fit a polynomial of the second degree to the form $y = a + bx + cx^2$ to the   L1   12M
following data by the method of least squares:

x	0	1	2	3	4
y	1	0	3	10	21

OR

8   (a)   A study of TV viewers was conducted to find the opinion about the mega   L2   6M
serial 'Ramayana'. If 56% of a sample of 300 viewers from south and 48% of
200 viewers from north preferred the serial, , test the claim at 0.05 level of
significance that there is a difference of opinion between south and north.

  (b)   Explain the test procedure for small sample test concerning difference   L3   6M
between two means.

UNIT-V

9   Test of the fidelity and the selectivity of 190 digital radio receivers   L3   12M
produced the results shown in the following table:

Fidelity		Low	Average	High
	Low	6	12	32
Selectivity	Average	33	61	18
	High	13	15	0

Use the 0.01 level of significance to test whether there is a relationship
between fidelity and selectivity.

OR

10   (a)   A test of the breaking strengths of 6 ropes manufactured by a company   L3   6M
showed a mean breaking strength of 7750 lb and a standard deviation of 145
lb, whereas the manufacturer claimed a mean breaking strength of 8000 lb.
Can we support the manufacturer's claim at a level of significance of 0.05?

  (b)   A study is conducted to compare the length of time between men and   L3   6M
women to assemble a certain product. Past experience indicates that the
distribution of times for both men and women is approximately normal but
the variance of the times for women is less than that for men. A random
sample of times for 11 men and 14 women produced the following data:

Men	Women
$n_1 = 11$	$n_2 = 14$
$s_1 = 6.1$	$s_2 = 5.3$

Test the hypothesis that $\sigma_1^2 = \sigma_2^2$ against the alternative that $\sigma_1^2 > \sigma_2^2$.
Use 0.05 level of significance.

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SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester (R19) Supplementary Examinations Feb 2022
BASIC ELECTRICAL & ELECTRONICS ENGINEERING
(CSE)

Time: 3 hours   Max.Marks: 60

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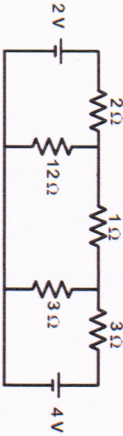**(Answer all Three units, 3 x 10 =30 Marks)**

UNIT - I

1. Discuss about various energy sources in detail.   L4   10M

OR

2. Find the current through 12Ω resistor for the given circuit using Kirchhoff's laws.   L3   10M
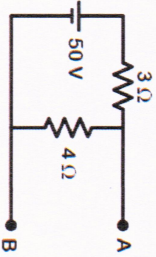

UNIT - II

3. Determine the maximum power delivered to the load resistance R_L L3   10M
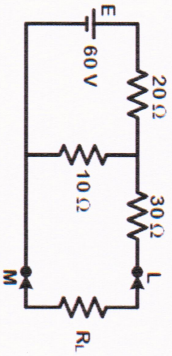
OR

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

UNIT - III

5. a) Discuss about the principle of operation of DC motors   L2   5M
   b) Calculate the value of torque established by the armature of a 4-pole DC motor   L3   5M
   having 774 conductors, 2 paths in parallel, 24mwb flux per pole when the total
   armature current is 50A

OR

6. A 220V shunt motor takes a total current of 80A and runs at 800 r.p.m. Shunt   L4   10M
   field resistance and armature resistance are 50Ω and 0.1Ω, respectively. If iron
   and friction losses amount to 1600W. Find (i) Copper losses (ii) Armature torque
   (iii) Shaft torque (iv) Efficiency

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

UNIT - I

1. a) Distinguish between conductors, semiconductors and insulators.   L2   5M
   b) Draw the atomic structure of a semiconductor and explain why an intrinsic   L3   5M
   semiconductor is relatively a poor conductor of electricity.

OR

2. a) What is Doping? Describe P-and N-type semiconductors?   L2   5M
   b) Explain the behavior of PN junction diode.   L2   5M

UNIT - II

3. a) Discuss the operation of PNP transistor with diagram   L2   5M
   b) If the base current in a transistor is 20μA when the emitter current is 6.4mA,   L3   5M
   what are the values of α and β? Also calculate the collector current.

OR

4. Draw the circuit diagram for a common Collector circuit arrangement and plot   L3   10M
   its input and Output characteristics. Show the different regions of the output
   characteristics and explain their occurrence.

UNIT- III

5. Explain the CS configuration? With construction and its operation   L3   10M

OR

6. a) Write the JFET applications   L1   4M
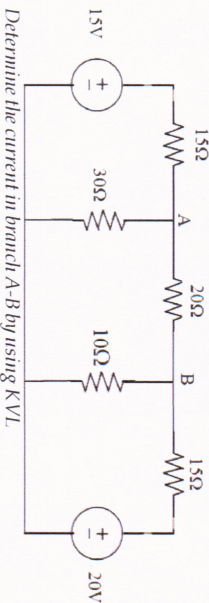   b) Explain the working of JFET as amplifier   L2   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb 2022
BASIC ELECTRICAL ENGINEERING
(ECE)

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   L1   6M

(circuit: 15V, 15Ω, 30Ω, A, 20Ω, B, 10Ω, 15Ω, 20V)

b) State and explain Kirchhoff's laws?   L1   6M

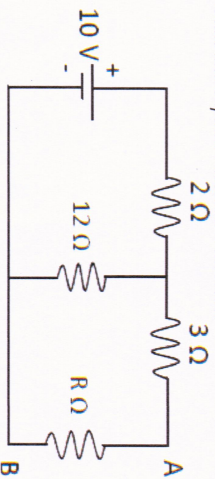**OR**

2 a) State and explain Thevenin's theorem.   L1   6M

b) Draw the Norton's equivalent circuit for the circuit shown in figure   L1   6M

(circuit: 10 V, 2 Ω, 12 Ω, 3 Ω, R Ω, A, B)

UNIT-II

3 Derive an expression for the current and impedance for a series RL and RC circuit excited by a Sinusoidally alternating voltage. Draw the phasor diagrams.   L3   12M

OR

4 a) Define power factor, apparent power, active power and reactive power   L2   6M

b) Z1 and Z2 are in parallel where currents corresponding impedances are I1 = 50∠10 and I2= 20∠30°. If the applied voltage is 100∠15V, find true power, reactive power and apparent power in each branch.   L2   6M

UNIT-III

5 Explain about the Working principle of a D.C generator   L1   12M

OR

6 a) How to control the speed of D.C. Shunt motor. Explain it with any one example.   L1   6M

b) A D.C.shunt generator has shuntfield winding resistance of 100Ω.It is supplying a load of 5KW at a voltage of 250V.It its armature resistance is 0.2Ω2.Calculate the induced emf of the generator.   L4   6M

UNIT-IV

7 A 5KVA, 500/250V, 50Hz, single –phase transformer gave the following results:
From O.C Test: 500V, 1A, 50W (H.V Side is opened)
From S.C Test: 25V, 10A, 60W (L.V Side is shorted) Determine:
(i) The Efficiency on Full-load, 0.8 lagging P.F.
(ii) The Voltage Regulation on Full-load 0.8 lagging P.F.
(iii) The Efficiency on 60% of Full-load, 0.8 lagging P.F.
(iv) The Voltage Regulation on Full-load,0.6 leading P.F.   L4   12M

OR

8 a) Derive an EMF equation of a single-phase transformer.   L1   6M

b) A single-phase transformer has 400 turns on primary winding 1000 turns on secondary winding. If it is operating at 50Hz supply with a maximum flux of 0.045Wb.Find Primary &Secondary induced EMF (ii) EMF induced per turn.   L4   6M

UNIT-V

9 Explain about:
(a)PVC cables (b)Wheather proof cables (c) VIR cables   L1   12M

OR

10 a) What is Earthing? Explain Plate Earthing in detail.   L1   6M

b) Explain about choice of wiring system.   L1   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb 2022
STRENGTH OF MATERIALS – I
(CIVIL ENGINEERING)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. A specimen of steel 25 mm in diameter with a gauge length of 200 mm is tested to destruction. It has an extension of 0.16 mm under a load of 80 kN and the load at elastic limit is 160 kN. The maximum load is 180 kN. The total extension is 56 mm and diameter at the neck is 18 mm. Find   L3   12M
   (i) The stress at elastic limit
   (ii) Young's modulus
   (iii) Percentage of elongation
   (iv) percentage reduction in area
   (v) Ultimate tensile stress.

OR

2. Obtain an expression for the major and minor principal stresses on a plane, when the body is subjected to direct stresses in two mutually perpendicular directions accompanied by a shear stress.   L2   12M

UNIT-II

3. Draw the shear force and bending moment diagrams in the following cases of cantilevers: L1   12M
   (i) Span of 10 m with udl of 3 kN/m for 6 m starting from the free end
   (ii) Span of 10 m with udl of 3 kN/m for 6 m starting from the fixed end
   (iii) Span of 14 m with udl of 3 kN/m for 6 m starting from 4 m and ending at 10 m from the fixed end.

OR

4. A cast iron water pipe of 500 mm inside diameter and 20 mm thick is supported over a span of 10 m. Find the maximum stress in the pipe metal, when the pipe is running full. Take density of cast iron as 70.6 kN/m3 and that of water as 9.8 kN/m3.   L3   12M

UNIT-III

5. a) Derive the formula for horizontal shearing stress flexural stress.   L3   6M
   b) Draw the shear stress distribution for a rectangular section of width 'b' and depth 'd'.   L1   6M

OR

6. A T-shaped cross section of a beam shown in Figure below is subjected to a vertical shear force of 100 kN. Calculate the shear stress at important points and draw shear stress diagram. Moment of inertia about the horizontal neutral axis is 113.4 x 106 mm4.   L3   12M
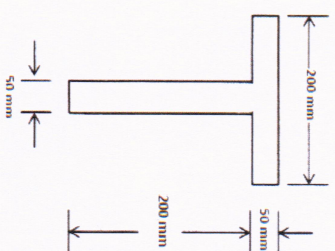
UNIT-IV

7. A cantilever of length 6 m carries a uniformly distributed load of 10 kN/m over the whole length. If E = 200 x 106 kN/m2 and I = 30 x 10-5 m4, determine the following, using conjugate beam method: L3   12M
   (i) Slope at the free end
   (ii) Deflection at the free end

OR

8. A beam AB of span 8 m is simply supported at the ends A and B and is loaded as shown in Figure. If E = 200 x 106 kN/m2 and I = 120 x 10-6 m4 determine: (i) Deflection at the mid span (ii) Maximum deflection (iii) Slope at the ends A.   L3   12M
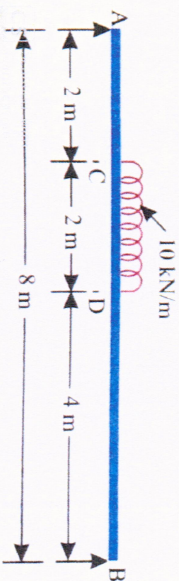
UNIT-V

9. A 2m long pin ended column of square cross-section is to be made of wood. Assuming E = 12 GPa and allowable stress being limited to 12 MPa, determine the size of the column to support the following loads safely. (i) 95 kN (ii) 20 kN. Use factor of safety of 3 and Euler's crippling load for buckling.   L3   12M

OR

10. a) Derive the equation of Euler's crippling load on a column when both ends of are hinged.   L3   6M
    b) An angular section 240 x 120 x 20 mm is used as 6 m long column with both ends are fixed. What is the crippling load for the column? Take E = 210 GPa   L1   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb 2022
PYTHON PROGRAMMING
(CE, EEE & MECH)

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

UNIT-I

1		Explain about the input and output statements or methods with example.	L3	12M

OR

2	(a)	What is dictionary? Explain the methods available in dictionary.	L3	6M
	(b)	Differentiate between the tuple and sets in python.	L2	6M

UNIT-II

3		List various types of operators in Python and write any 4 types of operators.	L3	12M

OR

4	(a)	Develop a program to find the largest among three numbers.	L2	6M
	(b)	Write a python program to find the given year is leap or not.	L2	6M

UNIT-III

5	(a)	Differentiate key word and default arguments	L5	6M
	(b)	Differentiate global and local variables	L5	6M

OR

6	(a)	Write a function to display ASCII Code of entered character	L5	6M
	(b)	Describe how an object is passed as parameter to a method	L2	6M

UNIT-IV

7		Explain about the different types of Exceptions in Python.	L1	12M

OR

8	(a)	Describe the any one regular expression	L2	6M
	(b)	Explain package installation via pip	L3	6M

UNIT-V

9		Explain in detail about Python Files, its types, functions and operations that can	L3	12M

OR

10	(a)	What is mean by Text File? Explain about reading and writing files in python?	L3	6M
	(b)	What is turtle with an example?	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations Feb 2022

ENGINEERING GRAPHICS
(Common to CE, EEE & ME)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. Draw a parabola having a distance of 50 mm between the focus and directrix. Draw a normal and tangent to the parabola at a point 35 mm from the focus. L2 12M

OR

2. a) A thread of length 165 mm is wound round a circle of 40 mm diameter. Trace the path of end point of the thread. L1 6M

b) Construct a rectangular hyperbola when a point P is at distance of 18 mm and 34 mm from two asymptotes. Also draw a tangent to the curve at a point 20 from an asymptote. L3 6M

UNIT-II

3. A square plane of side 40mm has its surface parallel to and 20 mm above HP. Draw its projections when
a).side is parallel to VP
b).a side inclined at 300 to VP.
c).all sides are equally inclined to VP L2 12M

OR

4. a) Two point A and B are on H.P, the point A being 30 mm in front of V.P, while B is 45 mm behind V.P. The line joining their top views makes an angle of 450 with XY. Find the horizontal distance between two points. L1 6M

b) A point A is 15 mm above HP and 20 mm in front of VP. Another point B is 25mm behind VP and 40 mm below HP. Draw the projections of A and B, Keeping the distance between the projectors equal to 90 mm. Draw straight lines , joining their top views and front views. L2 6M

UNIT-III

5. A cone with base 60 mm diameter and axis 75 mm long, is resting on its base on H.P. It is cut by a section plane parallel to H.P and passing through the mid-point of the axis. Draw the projections of the cut solid. L2 12M

OR

6. A pentagonal pyramid, with side of base 30mm and axis 60 mm long, resting with its base on H.P and one of the edges of its base perpendicular to V.P. It is cut by a section plane, parallel to H.P and passing through axis at a point 35 mm above base. Draw projections of the remaining solid L3 12M

UNIT-IV

7. A square pyramid with side of base 30 mm and axis 50 mm long ,is resting on its base on H.P with an edge of the base parallel to V.P is cut bysection plane, perpendicular to V.P and inclined at 450 to H.P. The section plane is passing through the mid- point of the axis. Draw the development of the surface of the cut pyramid L2 12M

OR

8. A cylinder of base diameter 40 mm and axis 55 mm long is resting on its base on HP.Its cut by a section plane perpendicular to VP and inclined at 45o to HP.The section plane is passing through the top end of an extreme generator of the cylinder.Draw the development of lateral surface of the cut cylinder L2 12M
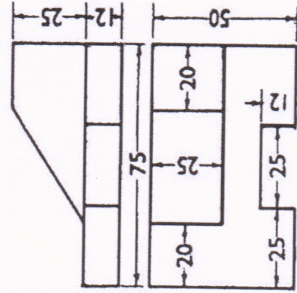
UNIT-V

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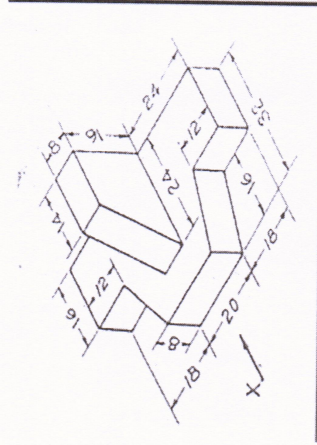
All Dimensions in mm

OR

10. Draw the isometric view of the following sketch L3 12M

All Dimensions in mm

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb 2022
DIGITAL LOGIC DESIGN
(CSE)

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

UNIT-I

1　a)　Simplify the Boolean expressions to minimum number of literals　　L6　6M
　　　i) X + XY + X Z + XYZ ii) (X+Y) (X+Y)
　b)　Obtain the Complement & Dual of Boolean Expression　　　　　　L5　6M
　　　i) A+B+ABC ii) AB + A (B +C) + B(B+D)

OR

2　　List and Explain about complements with examples?　　　　　　　L2　12M

UNIT-II

3　　Explain NAND- NOR implementations?　　　　　　　　　　　　L2　12M

OR

4　　Simplify the Boolean expression using K-MAP　　　　　　　　　L6　12M
　　　F(A,B,C,D,E)= Σm(0,2,4,6,9,11,13,15,17,21,25,27,29,31)

UNIT-III

5　　Design the combinational circuit binary to gray code?　　　　　　L5　12M

OR

6　a)　Explain about Binary Half Adder?　　　　　　　　　　　　　L2　6M
　b)　Design and draw a full adder circuit.　　　　　　　　　　　　L5　6M

UNIT-IV

7　a)　Explain the Logic diagram of JK flip-flop?　　　　　　　　　　L2　6M
　b)　Write difference between Combinational & Sequential circuits?　　L5　6M

OR

8　a)　Draw and explain the operation of D Flip-Flop?　　　　　　　　L2　6M

　b)　Explain about Shift Registers?　　　　　　　　　　　　　　　L2　6M

UNIT-V

9　　Explain about Error correction & Detection Codes with examples?　L2　12M

OR

10　　Construct the PROM using the conversion from BCD code to Excess-3 code?　L3　12M

R19

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations Feb 2022
Switching Theory and Logic Design
(ECE)

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

UNIT-I

1	Convert the given decimal number 234 to binary, quaternary, octal, hexadecimal and BCD equivalent.	L3	12M

OR

2	a)	Discuss about the laws of Boolean algebra.	L3	9M
	b)	Why NAND and NOR gate is called as universal gate	L2	3M

UNIT-II

3	Simplify the following Boolean function using K map: F(A, B, C, D)=Σ(2, 4, 6, 10, 12); d(A, B, C, D)=Σ(0, 8, 9, 13) and realize it using basic gates	L3	12M

OR

4	a)	Minimize the following Boolean function using K-Map F(A, B, C, D)= Σm(0, 2, 4, 6, 8, 10, 12, 14).	L2	6M
	b)	Realize it using NAND Gates.	L2	6M

UNIT-III

5	a)	Design & implement the 4 bit binary Adder.	L5	6M
	b)	Design & implement half Subtractor with truth table.	L5	6M

OR

6	a)	Design & implement Full Adder using Decoder.	L5	5M
	b)	Implement a 2-bit Magnitude comparator.	L2	7M

UNIT-IV

7	What are the different types of counters .Explain briefly.	L1	12M

OR

8	a)	Design D Flip Flop by using SR Flip Flop and draw the timing diagram.	L2	6M
	b)	Write the differences between combinational and sequential circuits.	L3	6M

UNIT-V

9	Realize F = Σm(0,2,3,7,9,11,15,16) using ROM	L3	12M

OR

10	Give the logic implementation of a 32x4 bit ROM using a decoder of a suitable figure.	L3	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester (R18) Supplementary Examinations FEB 2022
DIGITAL ELECTRONICS
(EEE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)
Answer the following; (5 X 2 = 10 Marks)

1.		
(a) State and prove Demorgan's theorem	L1	2M
(b) Define magnitude comparator and draw 2 – bit magnitude comparator.	L2	2M
(c) Define race around condition.	L1	2M
(d) Design TTL NAND gate.	L1	2M
(e) Write the classification of ROM.	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2. Convert the given decimal number 362 to octal, binary, Excess-3, hexadecimal and BCD equivalent.   L3   10M

OR

3. Express the function Y=A+AB+CB in (i)Canonical SOP form   (ii) Canonical POS form   L3   10M

UNIT – II

4. Minimize the given Boolean function   L3   10M
$F(A,B,C,D) = \Sigma m (0,1,2,3,6,7,13,15)$ using tabulation method and implement using basic gates

OR

5. (a) Design 32:1 Mux using two smaller size Mux.   L2   5M
   (b) With a logic diagram explain look a head carry adder.   L3   5M

UNIT – III

6. (a) Write the differences between combinational and sequential circuits.   L1   4M
   (b) Write the excitation table and characteristic equation for SR and JK flip-flop.   L2   6M

OR

7. Design MOD-10 Synchronous counter by using JK-Flip flop   L3   10M

UNIT – IV

8. Define ECL and draw the circuit of Tristate ECL logic and explain its functions.   L2   10M

OR

9. Define below   L1   10M
   (i) Fan-in   (ii) Fan-out   (iii) Propagation delay   (iv) Noise margin

UNIT – V

10. (a) Write the difference between RAM and ROM.   L1   4M
    (b) Implement the following Boolean function using PAL   L3   6M
    $F1(A,B,C)= \Sigma m(1,2,4,6)$, $F2(A,B,C)= \Sigma m(0,1,6,7)$, $F3(A,B,C)= \Sigma m(2,6)$ and $F4(A,B,C)= \Sigma m(1,2,3,5,7)$

OR

11. (a) Explain about RAM organization and write the different types of RAM.   L2   5M
    (b) Implement the following Boolean function using PROM.   L3   5M
    $F1(A,B)= \Sigma m(1,2)$, $F2(A,B)= \Sigma m(0,1,3)$

UNIT – IV

8. Draw the circuit diagram of an inverting and non inverting amplifier. Derive the expression of closed loop voltage gain. L2 10M

OR

9. Draw the circuit diagram of ideal and practical differentiator and obtain the expression their voltage gain. L2 10M

UNIT – V

10. Write a short note on various type of A/D conversion techniques. L1 10M

OR

11. Illustrate how to obtain the transfer function of second order active low pass filter with the help of general Sallen key filter. L4 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester (R18) Supplementary Examinations FEB 2022
ANALOG CIRCUITS
(ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)
Answer the following: (5 X 2 = 10 Marks)

1.
(a) Define cascade amplifier. L1 2M
(b) Compare positive feedback and Negative feedback. L4 2M
(c) What is stagger tuned amplifier ? L1 2M
(d) Mention the differences between differentiator and integrator. L1 2M
(e) Define Setting time of a DAC/ADC. L1 2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2. Short circuit CE current gain of a transistor is 25 at a frequency of 2MHz. If fβ=200KHz. Calculate (i) fᴛ (ii) hfe (iii) Find |Ai| at frequency of 10MHz and 100MHz. L3 10M

OR

3. If the overall lower and higher cutoff frequencies of a two identical amplifier connected in cascade are 600 Hz and 18 kHz respectively, compute the values of individual cutoff frequencies of both the amplifier stages. Also the discuss the effect of bandwidth in multistage amplifier. L3 10M

UNIT – II

4. Using block diagram, derive the closed loop forward transfer ratio of feedback system in terms of the open gain. L2 10M

OR

5. In Colpitts oscillator, C1 = 0.2 μF and C2 = 0.02 μF. if the frequency of the oscillator is 10 KHz , find the value of the inductor .Also find the required gain for oscillation. Also Represent the values in the circuit diagram of Colpitt Oscillator. L3 10M

UNIT – III

6. With a neat diagram ,explain Transformer coupled Class A Power Amplifier and derive its maximum efficiency. L1 10M

OR

7. A single tuned RF amplifier uses a transistor with an output resistance of 50 KΩ, output capacitance of 15 pF and internal resistance of next stage is 20 kΩ. The tuned circuit consists of 47 pF capacitance in parallel with series combination of 1μH inductance and 2Ω resistance. Calculate resonant frequency, effective quality factor and bandwidth of the circuit.Also draw the circuit diagram of double tuned circuit. L3 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester (R18) Supplementary Examinations Feb 2022
ENGINEERING GEOLOGY
(Civil Engineering)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)

(a)	Define geology? Write various branches of geology?	L1	2M
(b)	What is Moh's scale of hardness	L1	2M
(c)	What is metamorphism? State the various agents of metamorphism?	L2	2M
(d)	What do you mean by Aquifer? What are the various types of aquifers	L2	2M
(e)	What are landslides? Enumerate the various types of landslides	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)

UNIT – I

2.	What is weathering? Explain the various mechanisms of rock weathering	L3	10M

OR

3.	Explain the brief study of case histories of failure of some civil engineering constructions due to some geological drawbacks?	L3	10M

UNIT – II

4.	What is a rock forming mineral? Discuss process of formation of minerals in nature.	L3	10M

OR

5.	Name at least four clay minerals and their important engineering properties.	L3	10M

UNIT – III

6.	Define the term "rock" Describe the classification of rocks & their characteristics?	L2	10M

OR

7.	In what way the granite, limestone and marble are used on the basis of their civil engineering applications? Discuss their mechanical properties.	L4	10M

UNIT – IV

8.	Classify and describe the different types of faults? Discuss the effects of faulting on various engineering projects?	L2	10M

OR

9.	What is a water table? What are types of ground water? Explain the engineering significance of ground water?	L2	10M

UNIT – V

10.	What is a tunnel? Explain the terms that are used in tunnels with neat sketches? Explain the purpose of tunnelling?	L2	10M
11.	What are the various geological factors to be considered in the selection of site for construction of dams and reservoirs? Explain in detail with examples?	L4	10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech. II Year II Semester (R18) Supplementary Examinations FEB 2022
PROBABILITY STATISTICS & NUMERICAL METHODS
(EEE)

Time: 3 hours   Max. Marks: 60

PART-A
(Compulsory Questions)

Answer the following: (5 X 2 = 10 Marks)

1.	(a)	State the Baye's Theorem.	L1 2M
	(b)	If a fair coin is tossed six times, then find the Probability of getting four heads.	L4 2M
	(c)	Obtain mode of the values 10,12,15,20,12,16,18,15,12,10,16,20,12,24.	L1 2M
	(d)	Write Simpson formulae.	L1 2M
	(e)	Use Euler's method to find y (0.1) given $y' = (x^3 + xy^2)e^{-x}$, $y(0)=1$.	L1 2M

PART-B
(Answer all five units, 5 x 10 =50 Marks)

UNIT – I

2.   Two dice are thrown. Let A be the event that the sum of the point on the faces   L3   10M
is 9. Let B be the event that at least one number is 6. Then find   (i) $P(A \cap B)$
(ii) $P(A \cup B)$ (iii) $P(A^c \cup B^c)$ (iv) $P(A^c \cap B^c)$ (v) $P(A \cap B^c)$.

OR

3.   A random variable X has the following probability function: 10M

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

L3

Determine **(i)** K **(ii)** Evaluate $P(X \geq 6)$ and $P(0 < X < 5)$ **(iii)** if $P(X \leq K) > 1/2$, find
the minimum value of K **(iv)** variance.

UNIT – II

4.   (i) Derive mean and variance of Poisson distribution.   L2   6M+
(ii) If 2% of light bulbs are defective. Find the probability that (i) At least one   4M
is defective (ii) $p(l < x < 8)$ in a sample of 100.

OR

5.   Derive mean and variance of Normal distribution.   L3   10M

UNIT – III

6.   Compute Karl Pearson and Bowley's coefficient of Skewness to the following   L1   10M
data:

Class intervals	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
frequency	2	6	11	20	40	75	45	25	18	8

OR

7.   (i) Calculate the correlation coefficient for the following heights (in inches) of   L3   6M+
fathers (X) and their sons (Y):   4M

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

(ii) From the
following regression
equations, calculate $\bar{X}$, $\bar{Y}$ and r:
20X-9Y=107, 4X-5Y=-33.

UNIT – IV

8.   Find out the equation $x\log(x)_{10} = 1.2$ using false position method.   L2   10M

OR

9.   (i) Evaluate $\int_0^1 \frac{1}{1+x} dx$ by (i) trapezoidal rule and Simpson's $\frac{1}{3}$ rule.   L2   5M+
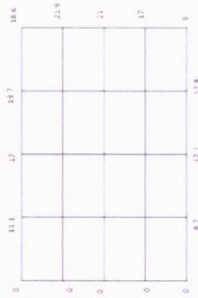   5M

(ii) Simpson's $\frac{3}{8}$ rule and compare the result with actual value.

UNIT – V

10.   Using R-K method of 4th order, solve $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$, $y(0)=1$ Find $y(0.2)$ and   L1   10M
$y(0.4)$.

OR

11.   Solve the Laplace Equation $u_{xx} + u_{yy} = 0$ given that,   L4   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester (R18) Supplementary Examinations Feb 2021
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(ME)

Time: 3 hours   Max.Marks: 60

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

UNIT - I

1.	(a)	Define and Explain about ohms law	L1	5M
	(b)	Explain about passive elements in detail	L1	5M

OR

2.	Three resistances of values 2Ω,3Ω and 5Ω are connected in series across 20V DC supply. Calculate (i) Equivalent resistance of the circuit. (ii) The total current of the circuit. (iii)The voltage drop across each resistor. (iv) The power dissipated in each resistor	L1	10M

UNIT - II

3.	(a)	Define and explain about Impedance parameters.	L1	5M
	(b)	Define and explain about Y- parameters	L1	5M

OR

4.	The given ABCD parameters are A=2,B=0.9,C=1.2,D=0.5 find Y- parameters	L2	10M

UNIT - III

5.	(a)	Explain principle of operation of transformer	L1	5M
	(b)	Derive EMF equation of a transformer	L3	5M

OR

6.	A 230Vshunt motor takes a total current of 70A and runs at 900 r.p.m .Shunt field resistance and armature resistance are 40Ω and 0.2Ω respectively. If iron and friction losses amount to 1700W. find (i)Copper losses(ii)Armature torque (iii)Shaft torque (iv)Efficiency	L2	10M

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

UNIT - I

1.	Explain the working of Bridge rectifier. Give the expressions for RMS current, PIV, ripple factor and efficiency.	L2	10M

OR

2.	Draw the block diagram of series and shunt voltage regulator and explain the operation of series & shunt voltage regulator	L4	10M

UNIT - II

3.	Draw and explain the input and output characteristics of a transistor in CC configuration	L4	10M

OR

4.	(a)	Explain the working of NPN and PNP transistor	L2	5M
	(b)	With neat diagram, describe the principle and working of Optocoupler	L4	5M

UNIT - III

5.	Explain the working of a P channel JFET and draw the V-I characteristics of it	L2	10M

OR

6.	Describe the kind of operation that takes place in the enhancement mode MOSFET. How does this differ from depletion mode type?	L2	10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech II Year II Semester (R18) Supplementary Examinations Feb 2022
Analog Communications
(ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)
Answer the following: (5 X 2 = 10 Marks)

1.
(a) Draw the spectrum of Vestigial Side Band (VSB)?   L2   2M
(b) Define the modulation index?   L1   2M
(c) Define the Signal to Noise Ratio and Figure of merit?   L1   2M
(d) What are two major differences between PAM and PWM?   L1   2M
(e) What is heterodyning?   L1   2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT - I

2. a. Explain generation of DSB-SC signal with the help of balanced modulator using diodes?   L2   6M
   b. A given AM broadcast station transmits a total power of 5kW when the carrier is modulated by sinusoidal signal with a modulation index of 0.7071. Determine Carrier power and Transmission Efficiency   L5   4M

OR

3. a. Derive an expression for SSB-SC wave using the pre-envelope concept?   L2   6M
   b. Draw the frequency spectrum of DSB-SC modulation with necessary mathematical expressions? L2   L3   4M

UNIT - II

4. a. A 20 MHz carrier is frequency modulated by a sinusoidal signal such that the peak frequency deviation is 100 kHz. Determine the modulation index and the approximate bandwidth of the FM signal if the modulating signal frequency is: (i) 1 kHz (ii) 15 kHz   L2   6M
   b. Compare slope detector and balanced slope detector?   L2   4M

OR

5. a. Write short note on Pre-Emphasis and De-Emphasis circuits?   L3   6M
   b. Explain the generation of FM using direct method?   L2   4M

UNIT - III

6. a. If each stage has a gain of 10dB and noise figure of 10dB. Calculate the overall noise figure of a two-stage cascaded amplifier?   L4   5M
   b. Explain briefly the thermal noise and shot noise?   L2   5M

OR

7. Derive the expression for figure of merit of AM (DSB-FC) system.   L3   10M

UNIT – IV

8. Explain the generation and demodulation of PAM?   L2   10M

OR

9. a. What is the need of the pulse modulation system?   L2   3M
   b. A 3KHz voice signal is transmitted with pulse amplitude modulation. Calculate the transmission bandwidth if the sampling frequency of 8KHz and pulse duration of 0.1Ts?   L4   7M

UNIT – V

10. Consider a binary input, output channel shown in figure below   L1   10M

x1 ──0.8──► y1
   ──0.2──►
x2 ──1──► y2
   ──0.3──►
x3 ──0.7──► y3
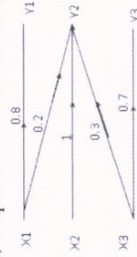
Find H(X), H(Y), H(X/Y), H(Y/X) and H(XY)?

OR

11. a. A Discrete source emits one of 5 symbols once every millisecond. The symbol probabilities are 1/2, 1/4, 1/8, and 1/16. Find entropy and information rate?   L4   5M
    b. Explain the functions of a radio receiver?   L2   5M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester (R18) Supplementary Examinations February 2022
FORMAL LANGUAGES AND AUTOMATA THEORY
(CSE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

Answer the following; (5 X 2 = 10 Marks)

1.
(a)	Define Finite Automaton.	L2	2M
(b)	What are the applications of automata theory?	L1	2M
(c)	Elaborate the Arden's theorem.	L3	2M
(d)	Write the regular expression to denote a language L which accepts all the strings which begin or end with either 00 or 11.	L3	2M
(e)	Mention about undecidable problems associated with Turing machines.	L2	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)

UNIT – I

2. Convert the following Mealy machine into its equivalent Moore machine.   L2   10M

Present State	I P=0		I P=1	
	Next State	O/P	Next State	O/P
→ A	C	0	B	0
B	A	1	D	0
C	B	1	A	1
D	D	1	C	0

OR

3.
(a)	Design DFA which accepts even number of 0's over (0,1).	L6	5M
(b)	Explain Chomsky Hierarchy.	L2	5M

UNIT – II

4.
(a)	Construct an equivalent FA for the given regular expression (0+1)*(00+11)(0+1)*	L1	5M
(b)	State Arden's theorem and construct the regular expression for the following FA using Arden's theorem.	L1	5M

OR

UNIT – III

5. Explain how equivalence between two FA is verified with an example.   L2   10M

6.
(a)	Define Ambiguous grammar.	L2	4M
(b)	Remove Left recursion from the grammar S->Sab/T T->Tcd/F F->Fa/G	L2	6M

OR

7. What is meant by simplifying grammar? Remove the Unit productions from the following Grammar. S-> aSb, S->A, A->cAd, A->cd   L3   10M

UNIT – IV

8. Construct a PDA to accept the language L={WWR / W ∈ (a,b)* }by empty stack and final state.   L5   10M

OR

9.
(a)	Explain about the graphical notation of PDA.	L2	4M
(b)	Construct an equivalent PDA for the following CFG. S->aAB | bBA A->bS|a B->aS | b.	L3	6M

UNIT – V

10. Explain conversion of regular Expression to TM with example.   L3   10M

OR

11. Design a Turing Machine to accept the set of all palindrome over {0,1}*. Draw the Trasition diagram for the same.   L6   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester (R18) Supplementary Examinations Feb 2022
MANUFACTURING PROCESSES
(Mechanical Engineering)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)

(a)	What is Gating Ratio?	L1	2M
(b)	List the three types of welding flames.	L4	2M
(c)	What is Cold working?	L1	2M
(d)	List any two characteristics of sheet metal.	L1	2M
(e)	What is parison?	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.	With the help of neat sketch explain the investment casting process. Also list out the applications.	L3	10M

OR

3.	Explain the various properties of moulding sand.	L2	5M
	Sketch and explain different types of patterns used in foundry.	L3	5M

UNIT – II

4.	Explain Laser beam welding and its advantages with neat sketch.	L2	10M

OR

5.	Elaborate the Submerged arc welding process and discuss its applications in brief.	L3	10M

UNIT – III

6.	What is Hot working? Explain the process in detail with neat sketches.	L1	10M

OR

7.	What are the defects in rolled parts? How we can rectify the same?	L3	5M
	What are the characteristics of rolling processes?	L2	5M

UNIT – IV

8.	Explain Bending operations with a suitable sketches.	L2	10M

OR

9.	What is Super plastic forming? Discuss in detail.	L2	10M

UNIT – V

10.	Explain the working principles and application of compression Moulding.	L1	10M

OR

11.	Explain the principle of operation of Blow moulding. List its applications also.	L4	10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech II Year II Semester (R18) Supplementary Examinations Feb2022
PROBABILITY THEORY AND STOCHASTIC PROCESSES
(ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)
Answer the following; (5 X 2 = 10 Marks)

1.
(a) What are the conditions for a function to be a Random variable?   L1   2M
(b) Define the expected value of a function of two random variables   L1   2M
(c) What is a stationary process? Explain.   L4   2M
(d) Derive the formula for power spectral density is an even function   L4   2M
(e) Define band pass random processes.   L1   2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.
(a) Explain the different types of random variables.   L1   5M
(b) Discuss Rayleigh and exponential distribution function.   L1   5M

OR

3.
(a) State and prove Bayes theorem of probability.   L4   5M
(b) An ordinary 52 Card deck is thoroughly shuffled. You are dealt four cards up.   L6   5M
What is the probability that all four cards are fives?

UNIT – II

4.
(a) Define and explain joint distribution function and joint density function of two   L1   5M
random variables X and Y.
(b) State and prove the properties of joint distribution function.   L4   5M

OR

5.
The joint pdf is given as $fx,y(x,y) = e^{-(2x+y)}$ for x≥0 and y≥0.   L6   10M
Find (a) the value of A and (b) the marginal density functions.

UNIT – III

6. What is cross correlation function of a random process? state and explain the   L1   10M
properties of Cross correlation function of a random process?

OR

7. Explain about first order, second, wide-sense and strict sense stationary process.   L1   10M

UNIT – IV

8.
(a) Discuss the properties of cross power density spectrum.   L4   5M
(b) Discuss the relation between cross power spectrum and cross correlation   L4   5M
function.

OR

9. State and prove properties of PDS   L4   10M

UNIT – V

10. (a) Explain about LTI system   L1   5M
(b) Find the power density spectrum of response of a linear system   L4   5M

11. Write notes on: L1   10M
(a) Band Pass random process.
(b) Band limited random process
(c) Narrow band random process.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester (R18) Supplementary Examinations FEB 2022
Materials, Testing and Evaluation
(CIVIL)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)

(a)	Name any four important stones used in the building construction.	L1	2M
(b)	List the types of cement.	L1	2M
(c)	Write the uses of bitumen & tar	L1	2M
(d)	What is light weight concrete?	L1	2M
(e)	Name important metals used in building construction	L4	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.	Write about manufacturing and defects of bricks	L3	10M

OR

3.	(a)	Explain the defects caused due to seasoning of timber.	L2	5M
	(b)	What are the objects of preservation of timber?	L2	5M

UNIT – II

4.	(a)	What are the field tests of cement	L2	5M
	(b)	What are the ingredients of cement? Explain them	L2	5M

OR

5.	(a)	Define Distemper and varnish?	L2	5M
	(b)	Write about painting plastered surfaces and painting metal surfaces?	L2	5M

UNIT – III

6.	Write briefly the following (a) Bitumen material (b) Asphaltic materials	L1	10M

OR

7.	(a)	How do you conduct sieve analysis on coarse aggregate in laboratory?	L2	5M
	(b)	Explain the test procedure for aggregate impact value test?	L2	5M

UNIT – IV

8.	Explain briefly the different methods to measure the workability of concrete?	L2	10M

OR

9.	Explain briefly self-compacting concrete including the advantages and disadvantages	L4	10M

UNIT – V

10.	Explain true stress-strain interpretation of tensile test.	L2	10M

OR

11.	Discuss about standards of different materials. (a) Brittle (b) Quasi brittle (c) Elastic	L2	10M

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester (R18) Supplementary Examinations FEB 2022
ELECTRICAL MACHINES-II
(EEE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)
Answer the following: (5 X 2 = 10 Marks)

1.			
(a)	What is the eddy current loss.	L1	2M
(b)	Express torque equation of 3–phase induction motor ?	L4	2M
(c)	Define voltage regulation in synchronous motor?	L1	2M
(d)	What is Cogging and how it can be rectified.	L1	2M
(e)	Define synchronous in synchronous motor.	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.	Explain the Scott connection of three phase transformer in detail with neat diagram.	L3	10M

OR

3.	Explain in detail about hysteresis losses and eddy current losses in 3-phase transformer with a neat diagram.	L3	10M

UNIT – II

4. (a)	Describe the production of rotating magnetic field rotor 3-phase induction motor with neat sketches.	L2	5M
(b)	Explain various losses in an induction motor and draw power flow diagram.	L2	5M

OR

5.	A 4-pole, 3-phase 50HZ induction motor is running at full load with a slip of 6%. The rotor is Star connected and its resistance and standstill reactance are 0.10 Ω and 8.5 Ω per phase. The emf between slip rings is 100V. Find the rotor current per phase and power factor assuming the slip rings are Short circuited.	L3	10M

UNIT – III

6.	Explain in detail about brake of 3-phase induction motor with a neat sketch and list out limitations.	L1	10M

OR

7.	A 300V, 20 HP, 50Hz, 6 pole delta-connected induction motor gave the following test data: No–load test : 300V,15A,1000W Blocked-rotor test : 100V,25A,3000W Draw the circle diagram and determine (a) line current and power factor at rated current(b) maximum output(c) maximum torque(d) full-	L3	10M

R18

load efficiency(e) full-load rotor speed.

UNIT – IV

8. (a)	Derive EMF equation of an alternator.	L2	4M
(b)	Explain the constructional features of synchronous generator with a neat sketch.	L2	6M

OR

9.	Derive the expression for voltage regulation when synchronous generator is supplying lagging power factor load.	L2	10M

UNIT – V

10.	What is meant by Synchronization? Explain any two methods of synchronization of alternator.	L1	10M

OR

11.	What is power factor? Explain the different methods of power factor correction?	L4	10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester (R18) Supplementary Examinations Feb 2022
SIGNALS & SYSTEMS
(EEE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)

(a)	Define a Signal. What is the relation between impulse, step, ramp and parabolic signals?	L1	2M
(b)	Differentiate the Fourier series and Fourier transform.	L1	2M
(c)	Define transfer function of a system	L1	2M
(d)	State Time convolution and Frequency convolution theorem	L1	2M
(e)	Find Z-transform and ROC of $x(n)=(1/2)n\, u(n-2)$	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)

UNIT – I

2.	Define a system. How are systems classified? Define each one of them	L3	10M

OR

3.	Explain the classification of signals in both continuous time and discrete time with suitable examples	L2	10M

UNIT – II

4.	a)	State and prove any three properties of the DTFT	L2	5M
	b)	Find the Fourier Transform of the Signal (i) Triangular Pulse (ii) $e^{-a\lvert t\rvert}$	L1	5M

OR

5.	a)	Find the Fourier transform of the following (i) sgn(t) (ii) $\sin \omega_0 t$ (iii) $\cos \omega_0 t$ (iv) 1(Constant Amplitude)	L1	5M
	b)	Find the Fourier transform of the following (i) impulse function (ii) $x(t)=e^{-at} u(t)$ (iii) $x(t)=e^{j\omega_0 t}$ (iv) $x(t)=u(t)$	L1	5M

UNIT – III

6.	a)	Analyze the Effects of the under sampling	L4	5M
	b)	A system produces an output of $y(t)= e^{-3t} u(t)$ for an input of $x(t)= e^{-5t} u(t)$. Determine the impulse response and frequency response of the system.	L3	5M

OR

7.	Consider a stable LTI system that is characterized by the differential equation $d^2y(t)/dt^2+4dy(t)/dt+3y(t)= dx(t)/dt+2x(t)$ find the response for an input $x(t)=e^{-t} u(t)$.	L3	10M

UNIT – IV

8.	a)	Distinguish the ESD and PSD.	L4	5M
	b)	Find the autocorrelation of the signal $x(t)= a \sin (\omega_0 t +\theta)$.	L3	5M

OR

9.	Explain the detection of periodic signals in the presence of noise by cross correlation	L2	10M

UNIT – V

10.	a)	State and prove time differentiation and time integration property of Laplace transform	L1	5M
	b)	Find the Laplace transform for any 5 standard signals	L1	5M

OR

11.	State and prove the any five Properties Laplace Transform	L3	10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester (R18) Supplementary Examinations Feb 2022
BIOLOGY FOR ENGINEERS
(ECE & CSE)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)

(a)	Define cell?	L1	2M
(b)	What is cell cycle?	L1	2M
(c)	Write any four functions of proteins?	L1	2M
(d)	Define DNA.	L1	2M
(e)	What is sterilization?	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.   What are Model organisms? Give brief notes n any three model organisms.   L1   10M

OR

3.   Draw neat labeled diagram of Plant cell. Write the differences between Plant cell and   L2   10M
Animal cell.

UNIT – II

4.   Explain Mendel's law of segregation and independent assortment in terms of genetics.   L2   10M

OR

5.   What is Mitotic Cell division? Explain Mitosis with neat diagram.   L2   10M

UNIT – III

6.   Describe the enzyme nature, properties and nomenclature?   L2   10M

OR

7.   What are carbohydrates? Classify and explain monosaccharide's.   L2   10M

UNIT – IV

8.   Explain genetic code & Degeneracy of genetic code?   L2   10M

OR

9.   Discuss the functions & Structure of Proteins?   L2   10M

UNIT – V

10.   Describe Krebs cycle.   L2   10M

OR

11.   Discuss an account on energy yielding and energy consuming reactions?   L2   10M

OR

8 For the continuous Probability function $f(x) = \begin{cases} kx^2 e^{-x}, & when\ x \geq 0 \\ 0, & Else\ where \end{cases}$ L1 12M

   Find i) k   ii) Mean   iii) Variance.

UNIT-V

9 a) Derive mean and variance of Binomial distribution   L3 6M

   b) 20% of items produced from a factory are defective. Find the probability that in a sample of 5 chosen at random (i) one is defective   (iii) $p(1<x<4)$ L6 6M

   OR

10 Calculate Correlation coefficient to the following data   L5 12M

X	10	15	12	17	13	16	24	14	22	20
Y	30	42	45	46	33	34	40	35	39	38

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations Feb 2022

NUMERICAL METHODS, PROBABILITY & STATISTIC

(CE & ME)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1 Find a real root of the equation $xe^x - \cos x = 0$ using Newton – Raphson method   L1 12M

   OR

2 a) Using Newton's forward interpolation formula and the given table of value   L3 6M
   Obtain the value of f(x) when x=1.4.

x	1.1	1.3	1.5	1.7	1.9
f(x)	0.21	0.69	1.25	1.89	2.61

   b) Use Newton's backward interpolation formula to find f(32) given f(25)=0.2707, f(30)=0.3027, f(35)=0.3386, f(40)=0.3794.   L3 6M

UNIT-II

3 Using R-K method, evaluate (0.1)and y(0.2)given $y^1 = x + y$; y(0) = 1.   L3 12M

   OR

4 a) Compute $\int_3^7 x^2 \log x\, dx$ by Trapezoidal Rule by taking 10 sub divisions   L5 6M

   b) Compute $\int_0^4 e^x\, dx$ by Simpson's 3/8th Rule by taking 12 sub divisions   L5 6M

UNIT-III

5 a) i) The weights of 6 competitors in a game are given below 58,62,56,63,55,61 kgs.Find arithmetic mean of weight of competitors.   L3 6M
      ii) Find the median of the following values 26, 8, 6, 12, 15, 32.

   b) Find arithmetic mean to the following data using step deviation method   L1 6M

Marks	10-20	20-30	30-40	40-50	50-60
Frequency	5	8	25	22	10

   OR

6 Two dice are thrown. Let A be the event that the sum of the point on the faces is 9. Let B be the event that at least one number is 6.   L1 12M
   Find (i) $P(A \cap B)$ (ii) $P(A \cup B)$ (iii) $P(A^c \cup B^c)$ (iv) $P(A^c \cap B^c)$ (v) $P(A \cap B^c)$

UNIT-IV

7 A random variable X has the following probability function   L5 12M

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

   Determine (i) K (ii) Mean (iii) variance
   (iv) if P(X≤K)>1/2, find theMinimum value of K

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
ELECTRONIC CIRCUIT ANALYSIS
(ECE)

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

UNIT-I

1   With neat diagram, explain Cascode amplifier and deduce the expressions for   L4   12M
     voltage gain, overall input resistance, overall current gain and output
     resistance of the cascode amplifier.

OR

2 a) Explain various methods used for coupling multistage amplifiers with their   L2   6M
      frequency response.
   b) Construct the block diagram of n-stage cascaded amplifier and analyze its   L3   6M
      various parameters.

UNIT-II

3   Determine the input and output resistances of Current Shunt feedback   L3   12M
     amplifier.

OR

4 a) Analyze Emitter follower circuit with necessary diagram for input and output   L4   6M
      resistances with feedback.
   b) Explain the effect of negative feedback on input resistance for Current shunt   L2   6M
      and Voltage shunt Feedback amplifier.

UNIT-III

5 a) Explain the working principle of Wein-bridge oscillator using BJT and deduce   L4   6M
      the expression for frequency of oscillations.
   b) In a Wein-bridge oscillator, if the value of R is 100 KΩ, and frequency of   L3   6M
      oscillation is 10 KHz, Calculate the value of capacitor C.

OR

6 a) Explain in detail the concept of stability in Oscillators.   L2   6M
   b) In the Colpitts oscillator, C1 = 0.2μF and C2 = 0.02 μF. If the frequency of   L3   6M
      oscillation is 10kHz, Calculate the value of inductor.

UNIT-IV

7   Explain the working principle of Push Pull Class B Power Amplifier with neat   L1   12M
     diagram and determine its maximum efficiency.

OR

8 a) A single tuned RF amplifier uses a transistor with an output resistance of 50   L3   6M
      KΩ, output capacitance of 15 pF and internal resistance of next stage is 20 kΩ.
      The tuned circuit consists of 47 pF capacitance in parallel with series
      combination of 1μH inductance and 2Ω résistance. Determine resonant
      frequency, effective quality factor and bandwidth of the circuit.
   b) With circuit diagram, describe the stagger tuning operation. Sketch necessary   L3   6M
      waveforms.

UNIT-V

9   Explain the various triggering methods for Bistable multivibrator with neat   L2   12M
     diagrams.

OR

10 a) Explain the operation of Emitter Coupled Monostable multivibrator.   L2   8M
   b) List the applications of Bistable multivibrator.   L1   4M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations Feb 2022

DISCRETE MATHEMATICS
(CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1. Explain the connectives with their truth tables and also Construct the truth table for the formula $\neg(\neg P \vee \neg Q)$ L3   12M

OR

2. a) Define Quantifiers and types of Quantifiers with examples   L3   6M
   b) Show that $(\exists x) M(x)$ follows logically from the premises $(\forall x)(H(x) \rightarrow M(x))$ and $(\exists x)H(x)$ L2   6M

UNIT-II

3. If $f: R \rightarrow R$ and $g: R \rightarrow R$ defined by $f(x) = x^3 - 4x$, $g(x) = \dfrac{1}{(x^2+1)}$, $h(x) = x^4$,   L3   12M

   find the following composition functions:
   a) $(f \circ g \circ h)(x)$ b) $(h \circ g \circ f)(x)$ c) $(g \circ g)(x)$ d) $(g \circ h)(x)$

OR

4. a) Define Relation? List out the properties of Binary operations.   L2   6M
   b) Let X = {1, 2, 3, 4} and $X = \{(1,1),(1,4),(2,2),(2,3),(3,3),(4,1),(4,4)\}$. Then prove that R is an equivalence relation.   L2   6M

UNIT-III

5. a) In how many ways can the letters of the word COMPUTER be arranged? How many of them begin with C and end with R? How many of them do not begin with C but end with R?   L5   6M
   b) Out of 9 girls and 15 boys, how many different committees can be formed each consisting of 6 boys and 4 girls?   L5   6M

OR

6. a) What is the co-efficient of (i) $x^3 y^7$ in $(x + y)^{10}$ (ii) $x^2 y^4$ in $(x - 2y)^6$ L5   6M
   b) Enumerate the number of non negative integral solutions to the inequality $x_1 + x_2 + x_3 + x_4 + x_5 \leq 19$.   L2   6M

UNIT-IV

7. (i) Solve the R.R $a_{n+2} - 2a_{n+1} + a_n = 2^n$ with initial condition $a_0 = 2, a_1 = 1$ L1   12M

   (ii) Solve the recurrence relation $a_n = a_{n-1} + \dfrac{n(n+1)}{2}$

OR

8. a) Solve $a_n - 5a_{n-1} + 6a_{n-2} = 2^n$, $n > 2$ with condition the initial $a_0 = 1, a_1 = 1$. Using generating functions.   L2   6M
   b) Using generating function solve $a_n = 3a_{n-1} + 2$, $a_0 = 1$ L3   6M

UNIT-V

9. Let G be a 4 – Regular connected planar graph having 16 edges. Find the number of regions of G.   and also draw the graph represented by given Adjacency matrix   L3   12M

   (i) $\begin{bmatrix} 1 & 2 & 0 & 1 \\ 2 & 0 & 3 & 0 \\ 0 & 3 & 1 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix}$ (ii) $\begin{bmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \end{bmatrix}$

OR

10. a) Show that the two graphs shown below are isomorphic?   L3   6M
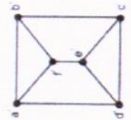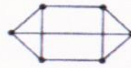
b) Define Spanning tree and explain the algorithm for Depth First search (DFS) traversal of a graph with suitable example.   L3   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
SWITCHING THEORY AND LOGIC DESIGN
(EEE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

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

OR

2	a)	Convert the following numbers to Decimal and then to Octal. (i) $(423416)_{10}$ (ii) $(10010011)_2$	L1	6M
	b)	Convert the following to Decimal and then to Hexadecimal. (i) $(1234)_8$ (ii) $(11001111)_2$	L1	6M

UNIT-II

3	Simplify the following Boolean expressions using K-map. $F(A, B, C, D)= \pi M(0,2,3,8,9,12,13,15)$	L3	12M

OR

4	What are the universal gates? Implement logic gates by using NAND and NOR gates.	L2	12M

UNIT-III

5	Design & implement Half Adder and Full Adder with truth table.	L3	12M

OR

6	What is Decoder? Design the circuit for 3 to 8 decoder with truth table.	L1	12M

UNIT-IV

7	Design and implement 3-bit ripple counter using J-K flip flop. Draw the state diag diagram and timing diagram for the same.	L3	12M

OR

8	a)	Explain working of Master Slave Flip flop with neat diagram.	L1	6M
	b)	Draw the logic diagram T Flip Flop by using JK Flip Flop and draw the timing diagram.	L1	6M

UNIT-V

9	Explain the following related to sequential circuits. a)State diagram b) State table c) State assignment	L2	12M

OR

10	Implement the following Boolean function using PAL.
	   (i)$W(A,B,C,D) = \Sigma m(0,2,6,7,8,9,12,13)$
	   (ii)$X(A,B,C,D) = \Sigma m(0,2,6,7,8,9,12,13,14)$
	   (iii)$Y(A,B,C,D) = \Sigma m(2,3,8,9,10,12,13)$
	   (iv)$Z(A,B,C,D) = \Sigma m(1,3,4,6,9,12,14)$
		L3	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
FLUID MECHANICS
(CIVIL ENGINEERING)

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

UNIT-I

1 Define the physical properties of fluids and its values And write   standard   L2   12M
   values and its units.

OR

2 A simple U-tube manometer containing mercury in which a fluid of sp.   L3   12M
   Gravity 0.8 and having vacuum pressure. The other end of the manometer is
   open to atmosphere. Find the vacuum pressure in pipe. If the mercury level in
   the limb is 40 cm and height of fluid in the left from the center of pipe is 15
   cm below.

UNIT-II

3 Derive Continuity Equation in 3-Dimensional flow.   L3   12M

OR

4 The Stream function for a Two-dimensional flow is given by Q = 2xy.   L3   12M
   Calculate the velocity at the point P (2, 3). Find the velocity potentialø.

UNIT-III

5 A pipe line carrying oil of specific gravity of 0.87, changes in diameter from   L2   12M
   200m diameter at a position A to 500mm diameter at a position B which is 4m
   at a higher level. If the pressure at A&B are 9.81 N/cm^2 and 5.886 N/cm^2
   respectively and the discharge is 200 lit/ sec. Determine the loss of head and
   the direction of flow.

OR

6 A horizontal venturimeter with inlet and throat diameter of 30 cm and 15 cm   L3   12M
   respectively is used to measure the flow of water. The readings of differential
   manometer connected to the inlet and the throat is 20 cm of mercury. Determine
   the rate of flow. Take the C_d = 0.98.

UNIT-IV

7 An oil of specific gravity is flowing through a pipe of 300mm at the rate of   L3   12M
   50lit/s. find the head lost due to friction and power required to maintain the
   flow for length of 1000m.

OR

8 Briefly explain about Hardy cross method.   L2   12M

UNIT-V

9 Calculate i) pressure gradient along flow ii) average velocity iii) discharge for   L3   12M
   an oil of viscosity 0.02 Ns/m^2 flowing between two stationary parallel plates
   1m wide maintained 10mm apart. The velocity between plates is 2m/s.

OR

10 Derive an expression for velocity distribution in turbulent flow.   L2   12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations Feb 2022

ENGINEERING THERMODYNAMICS

(MECHANICAL ENGINEERING)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1 a) What is a thermodynamic system? Explain different types of systems with suitable examples.   L1   6M

b) Explain thermodynamic State, Process and Cycle   L2   6M

OR

2 a) A tank is filled with oil whose density is 850 kg/m³. If the volume of the tank is 2 m³, determine the amount of mass in the tank.   L3   6M

b) Compare the cyclic process and non-cyclic process.   L1   6M

UNIT-II

3 Air flows steadily at the rate of 0.4 kg/s through an air compressor, entering at 6 m/s with a pressure of 1 bar and a specific volume of 0.85 m3/kg and leaving at 4.5 m/s with a pressure of 6.9 bar and a specific volume of 0.16 m3/kg. The internal energy of air leaving is 88 kJ/kg greater than that of the air entering. Cooling water in a jacket surrounding the cylinder absorbs heat from the air at the rate of 59 W. Calculate the power required to drive the compressor and the inlet and outlet cross-sectional area.   L3   12M

OR

4 a) Explain Equivalence of Kelvin Planck and Clausius statement   L2   6M

b) 5 kg of air at 550 K and 4 bar is enclosed in a closed system.(i) Determine the availability of the system if the surrounding pressure and temperature are 1 bar and 290 K respectively.   L3   6M

UNIT-III

5 a) Develop the expression of work transfer for an ideal gas in reversible isothermal process.   L2   6M

b) Prove that for an ideal gas C_p- C_v=R.   L1   6M

OR

6 a) 0.2 m³ of air at 4 bar and 130 ºC is contained in a system. A reversible adiabatic expansion takes place till the pressure falls to 1.02 bar. The gas is then heated at constant pressure till enthalpy increases by 72.5 kJ. Calculate (i) The work done; (ii) The index of expansion giving the same work between the same initial and final states. Take c_p = 1 kJ/kg K, c_v = 0.714 kJ/kg K.   L3   6M

b) A certain gas has c_p = 1.968 kJ/kg K, and c_v = 1.507 kJ/kg K. Find its molecular weight and gas constant.   L2   6M

UNIT-IV

7 In an Otto cycle air at 15°C and 1.02 bar is compressed until the pressure is 12.5 bar. The heat is added at constant volume until the pressure rises to 35 bar absolute. Calculate the compression ratio, the air standard efficiency and the mean effective pressure. Take γ = 1.4.   L3   12M

OR

8 a) Explain the steam formation with relevant sketch and label all salient points.   L2   6M

b) A mass of 0.09 kg of steam usually at a pressure of 1.5Mpa at temperature of 250ºC. Expand to 150Kpa. Assume process is isentropic. Find condition of steam, woke done and heat transfer.   L3   6M

UNIT-V

9 In a steam power plant operating on an ideal reheat Rankine cycle. The steam enters the high pressure turbine at 3Mpa and 400ºC. After expansion to the condenser to 0.6Mpa, the steam is reheated 400ºC and expanded to low pressure turbine to the condenser pressure of 10Kpa. Determine the thermal efficiency of the cycle and quality of steam at low pressure turbine.   L3   12M

OR

10 a) Explain the process of improving Rankine cycle efficiency with regeneration.   L2   6M

b) In a regenerative cycle, the steam pressure at turbine inlet is 30 bar and the exhaust is at 0.04 bar the steam is initially saturated. Enough steam is bled off at the optimum pressure of 3bar to heat the feed water determine the cycle efficiency.   L3   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
Analog Electronic Circuits
(EEE)

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

UNIT-I

1	Derive the expressions of Gain, input and output resistances for a Voltage Shunt FBA	L2	12M

OR

2	a)	List the characteristics of negative feedback amplifiers	L1	6M
	b)	Illustrate the basic concept of Feedback amplifier with suitable block diagram	L2	6M

UNIT-II

3	Analyze an LC Oscillator with necessary equation	L4	12M

OR

4	a)	Explain the working principle of Wein-bridge oscillator using BJT and derivethe expression for frequency of oscillations	L2	6M
	b)	In a Wein-bridge oscillator, if the value of R is 100 KΩ, and frequency of oscillation is 10 KHz, Examine the value of capacitor C	L2	6M

UNIT-III

5	a)	Draw the various functional blocks of an operational amplifier IC. Explaineach block	L2	6M
	b)	Draw the equivalent circuit diagram of Op amp and derive the expression forgain of inverting amplifier	L2	6M

OR

6	a)	Discuss the electrical characteristics of an OP-AMP in detail	L1	6M
	b)	Explain the term slew rate and write the importance in op-amp circuits	L2	6M

UNIT-IV

7	Draw a neat circuit of an integrator circuit. Explain the functioning with the input-output waveforms and derive the output equation	L2	12M

OR

8	a)	Design a differentiator to differentiate an input signal that varies in frequency from 10 Hz to about 1 kHz	L3	6M
	b)	Explain sample and hold circuit using op-amp	L3	6M

UNIT-V

9	Design a lowpass filter at a cut-of frequency of 15.9kHz with passband gain 1.5 and plot frequency response of this circuit	L3	12M

OR

10	a)	Draw and explain the weighted resistor DAC	L3	6M
	b)	An 8-bit Analog to Digital converter has a supply voltage of +12 volts. Calculate: (i) The voltage step size for LSB. (ii) The value of analog input voltage for a digital output of 01001011	L5	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
Analog Communications
(ECE)

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

UNIT-I

1	a)	With the help of block diagram explain of communication system. Define modulation? Explain different types of modulation.	L2	12M

OR

2	a)	Develop an expression for transmission efficiency of AM.	L3	6M
	b)	A given AM broadcast station transmits a total power of 5kW when the carrier is modulated by sinusoidal signal with a modulation index of 0.7071. Determine Carrier power and Transmission Efficiency.	L2	6M

UNIT-II

3		Illustrate single tone modulation for transmitting only upper side band (USB) frequency of SSB modulation	L2	12M

OR

4	a)	Explain the generation of SSB-SC wave using phase discrimination method with the help of neat functional diagram.	L2	6M
	b)	Show that the output of coherent detector of SSB modulated wave is given by $V_O(t)=1/4\ A_C\ m(t)\cos\phi+1/4\ A_C\ m(t)\sin\phi$.	L2	6M

UNIT-III

5	a)	Obtain the necessary expression for single tone NBFM.	L5	6M
	b)	Explain the generation of Narrowband Frequency Modulation and Narrowband Phase Modulation with suitable block diagrams.	L2	6M

OR

6	a)	Discuss about FM transmitter.	L1	6M
	b)	A single-tone FM is represented by the voltage equation as: $v(t) = 12\cos(6 \times 10^6 t + 5\sin 1250t)$ Determine the following: (i) Carrier frequency (ii) Modulating frequency (iii) Modulation index (iv) What power will this FM wave dissipate in 10Ω resistors?	L4	6M

UNIT-IV

7		Draw block diagram of Super-heterodyne AM receiver and explain Function of each block.	L5	12M

OR

8	a)	Write a short note on external noise sources.	L2	6M
	b)	Describe thermal noise and shot noise.	L3	6M

UNIT-V

9		Explain the demodulation of PAM signals.	L2	12M

OR

10	a)	What are the differences between PAM, PWM, and PPM?	L4	6M
	b)	Explain how PPM can be generated from PWM signals	L2	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations February 2022
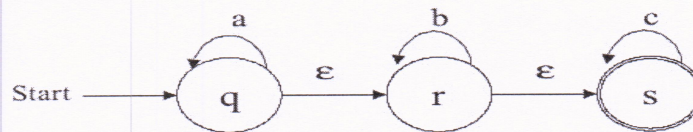FORMAL LANGUAGES AND AUTOMATA THEORY
(CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1   Convert the following NFA with ε moves to DFA without ε moves by ε-   L3   12M
     closure method.

OR

2   a)   Analyze and explain with example Chomsky Hierarchy.   L4   6M
     b)   Design DFA which accepts language L = {100, 101}.   L6   6M

UNIT-II

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

OR

4   a)   Give the Closure properties of Regular Sets.   L2   6M
     b)   Explain how equivalence between two FA is verified with example.   L1   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   Interpret simplification of the given grammar. Simplify the following   L5   12M
     CFG. S→ aSb   S→A   A→cAd   A→cd

UNIT-IV

7   a)   Define PDA? Explain graphical notation of PDA.   L2   6M
     b)   Explain acceptance of PDA with empty stack.   L5   6M

OR

8   Construct a DPDA to accept the language L={WCW^R / W ∈ (a,b)^+ } by   L6   12M
     empty stack and final state.

UNIT-V

9   a)   Explain the procedure adapted to convert RE to TM.   L2   6M
     b)   Convert the given regular Expression (a+b)*(aa+bb)(a+b)* to TM.   L3   6M

OR

10   Define Mathematical Definition of Turing Machine. Describe Recursive   L2   12M
     and Recursively Enumerable Languages.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
ENGINEERING GEOLOGY
(Civil Engg.)

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

UNIT-I

1   How is Geology related to Engineering? Discuss the scope of application of   L3   12M
     geological knowledge in the planning work?

OR

2   a) Discuss the application of engineering geology in civil engineering projects.   L3   6M
     b) Explain the study of case histories of failure of some civil engineering   L2   6M
         constructions due to some geological draw backs?

UNIT-II

3   Explain the different physical properties of minerals and state how these   L3   12M
     are useful in the accurate identification of the mineral species.

OR

4   a) Explain the various process of formation of ore minerals.   L2   6M
     b) Explain the various physical properties useful to identify a mineral in hand   L2   6M
         specimen. Describe any three in detail.

UNIT-III

5   a) Explain the composition, texture, characteristics, occurrence and uses of   L2   6M
         limestone, schist, gneiss.
     b) Analyze the composition, texture, characteristics, occurrence and uses of   L4   6M
         laterite, slate, quartzite.

OR

6   a) How would you differentiate between igneous rock, metamorphic rock and   L5   6M
         sedimentary rock on the basis of structure and texture?
     b) Write a case study about rocks and mineral resource of any geological   L2   6M
         conditions in India.

UNIT-IV

7   Explain the types of electrode configuration profiling sounding and   L3   12M
     applications of resistivity methods and their importance of civil
     engineering.

OR

8   a) Explain in detail the principal, procedure and applicability of seismic   L2   6M
         methods for subsurface investigations.
     b) With a neat sketch, describe a clinometer-compass and write a note on its   L3   6M
         uses. And explain True dip and Apparent dips?

UNIT-V

9   Enumerate the various types of landslides. Add a note on the preventive   L3   12M
     Measures to be taken to prevent the landslides.

OR

10   a) Explain the relationship between valley topography and types of dams.   L3   6M
     b) How the geological structures are responsible for the failure of any tunnel   L3   6M
         alignment.

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
Manufacturing Processes
(ME)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1		With neat sketch explain shell moulding process.	L3	12M

OR

2	a)	Sketch the cross section of a sand mould which is ready for pouring,and label the various important parts.	L3	6M
	b)	What are the requirements of good moulding sand?	L2	6M

UNIT-II

3		Write short notes on submerged arc welding with neat sketch and write its applications.	L3	12M

OR

4	a)	Write short note :1) Seam welding 2) Projection welding	L2	6M
	b)	Explain the classification of welding processes briefly.	L2	6M

UNIT-III

5	a)	What are the applications and limitations of hot working processes?	L5	6M
	b)	Discuss the principle of extrusion process.	L5	6M

OR

6	a)	With neat sketch explain magnetic pulse forming process.	L5	6M
	b)	With neat sketch explain the rod and wire drawing.	L2	6M

UNIT-IV

7		Discuss the mixing and blending methods of powders.	L1	12M

OR

8	a)	What are the types of shearing?	L2	6M
	b)	Differentiate the formability and spinning process.	L3	6M

UNIT-V

9		Explain the working principles and application of Rotational Moulding	L3	12M

OR

10	a)	Explain the polymerization briefly?	L3	6M
	b)	Explain the working principles and application of Blow Moulding.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
ELECTROMAGNETIC FIELDS
(EEE)

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

UNIT-I

1	a)	Given point P (-2, 6, 3) and A= y a_x +(x+z) a_y. Express A in Cylindrical coordinates.	L3	6M
	b)	Transform the vector A= 3i-2j-4K at P (x=2, y=3, z=3) to cylindrical coordinates	L2	6M

OR

2	a)	Determine the curl of the vector fields:	L3	6M
	b)	i).P=x^2yz a_x +xz a_z , ii) Q= r sin Φ a_r +r^2 z a $_Φ$ + z cos Φ a_z and iii) T= (1/r^2) cos θ a_r + r sin θ cos Φ $a_θ$+Cosθ $a_φ$	L2	6M

UNIT-II

3	Three concentrated charges of 0.25 μC are located at the vertices of an equilateral triangle of 10 cm side. Find the magnitude and direction of the force on one charge due to other two charges.	L3	12M

OR

4	Line charge density $ρ_L$= 24 n C/m is located in free space on the line y=1 and Z=2 m a) Find E at the point P(6,-1,3) , b) What point charge Q_a should be located at A (-3,4,1) to make y component of total E zero at point P?	L2	12M

UNIT-III

5	Explain the phenomenon of polarization when a dielectric slab is subjected to an electric field?	L5	12M

OR

6	Find V at P (2, 1, 3) for the field of two coaxial conducting cones, with V=50 V, at θ=30 and V=20 V, at θ=50.	L5	12M

UNIT-IV

7	In cylindrical co-ordinates A=50 r^2 a_z wb/m is a vector magnetic potential in a certain region of free space. Find H, B, J and using J find the total current I crossing the surface 0<r<1, 0<Φ<2π and Z=0.	L4	12M

OR

8	Derive the expression for self-inductance of solenoid, toroid and coaxial cable	L4	12M

UNIT-V

9	What is displacement current? Explain physical significance of displacement current?	L5	12M

OR

10	Derive the equation of Continuity for time varying fields?	L5	12M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
LINEAR & DIGITAL IC APPLICATIONS
(ECE)

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

UNIT-I

1   Derive the Closed loop gain equation for an Inverting amplifier and draw its   L3   12M
      Input-output Waveforms.

OR

2   a)   Illustrate the Ideal Differential Amplifier with Differential mode gain and   L3   6M
        Common mode gain expressions.
   b)   Explain about the operation of sample and hold circuit with relevant   L2   6M
        Waveforms.

UNIT-II

3   Solve for operating frequency in Wien bridge oscillator using op-amp.   L3   12M

OR

4   a)   Draw the circuit diagram of the wide Band-Reject Filter and explain its   L2   6M
        operation.
   b)   With the help of schematic diagram explain how 555 timer can be used as   L2   6M
        Monostable multivibrator.

UNIT-III

5   a)   The basic step of a 9-bit DAC is 10.3 mV. If "000000000" represents 0V.   L5   6M
        Estimate the output voltage for the input is "101101111".
   b)   Interpret, the characteristics of different types of ADCs.   L5   6M

OR

6   a)   Explain in detail about the block schematics of PLL.   L5   6M
   b)   Explain in detail about basic ECL logic circuit.   L2   6M

UNIT-IV

7   Explain in detail different modeling styles of VHDL with suitable examples.   L1   12M

OR

8   a)   Explain about functions and procedures with an example.   L2   6M

   b)   Design the logic circuit and write VHDL program for the following function.   L3   6M
         $F(Y) = \Pi\ A, B, C, D\ (1, 4, 5, 7, 9, 11, 12, 13, 15)$.

UNIT-V

9   Draw a priority encoder that can handle 32 requests. Use 74×148 and   L3   12M
      required discrete gates. Provide the truth table and explain the operation.

OR

10   a)   Draw the logic symbol of 74 x 85, 4-bit comparator and write a VHDL code   L3   6M
        for it.
    b)   Classify the various types of counters.   L3   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	a)	Explain the control statements in Java with example	L3	6M
	b)	Explain the Structure of Java program. Explain type of programs in Java	L3	6M

OR

2	a)	Define Conditional Operator. Narrate with the suitable example.	L3	6M
	b)	State the Java Selection Statements. Give an example to each one.	L2	6M

UNIT-II

3		Explain about the Dynamic Method Dispatch in Java with example.	L3	12M

OR

4	a)	What is a package? How to create user defined package in Java with example.	L2	6M
	b)	What is an interface? Rules to create an interface in Java with example	L2	6M

UNIT-III

5	a)	Distinguish between caught and uncaught exception	L4	6M
	b)	Justify with an example Java program to implement inter thread communication	L5	6M

OR

6		What is an Exception? Explain different types of Exception with example	L4	12M

UNIT-IV

7		Discuss about the File Input Stream and File Output Stream in Java with examples.	L1	12M

OR

8	a)	How will you create a file in Java with example?	L3	6M
	b)	How do you Write and Read a file in Java with an example.	L3	6M

UNIT-V

9		Explain the following methods in Java. a) Default Method b)Static Method	L3	12M

OR

10	a)	Differentiate between AWT and SWING	L4	8M
	b)	Discuss Functional Interface in Java	L2	4M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022

Theory of Machines

(MECH)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1 The turning moment diagram for a multi-cylinder engine has been drawn to scale of 1mm =4500N-m vertically and 1mm=2.4 0 horizontally. the intercepted areas between output torque curve and mean resistance line taken in order from one end are 342, 23, 245, 303, 115, 232, 227 and 164 mm², when the engine is running at 150 r.p.m. if the mass of the fly wheel is 1000 kg and the total fluctuation of speed does not exceed 3% of mean speed, find the minimum value of the radius of gyration.   L4   12M

OR

2 The torque exerted on the crank shaft of a two-stroke engine is given by the equation (N-M) =145,00+2300sin2(θ)-1900cos2(θ) where 'θ' is the crank angle displacement from the inner dead center. Assuming the resisting torque to be constant, determine;   L4   6M

1. The power of the engine when the speed is 150 r.p.m.
2. The moment of inertia of the fly wheel if the speed variation is not to exceed ±0.5% of the mean speed, and
3. The angular acceleration of the fly wheel when the crank has turned through 300 from the IDC.

UNIT-II

3   L3   12M
(a) Define clutch.
(b) Distinguish between a brake and a dynamometer.
(c) Write the principle of Dynamometer.
(d) List various types of the brakes.
(e) Distinguish between absorption and transmission dynamometers.

OR

4
a) Describe the construction and operation of a (a) Prony brake and (b) rope brake absorption dynamometer with neat sketch.   L2   6M
b) Describe with sketches one form of torsion dynamometer and explain in detail the calculations involved in finding the power transmitted.   L2   6M

UNIT-III

5
a) Explain with neat sketch the working principle of centrifugal governor   L2   6M
b)   L2   6M
(a) How the governors are classified?
(b) What is meant by Sensitiveness of governors?
(c) Distinguish between a Governor and a flywheel.

OR

6 A Hartnell governor having a central sleeve spring and two right-angled bell crank levers moves between 290 r.p.m. and 310 r.p.m. for a sleeve lift of 15 mm. The sleeve arms and the ball arms are 80 mm and 120 mm respectively. The levers are pivoted at 120 mm from the governor axis and mass of each ball is 2.5 kg. The ball arms are parallel to the governor axis at the lowest equilibrium speed. Determine: 1. loads on the spring at the lowest and the highest equilibrium speeds, and 2. stiffness of the spring.   L4   12M

UNIT-IV

7   L2   12M
(a) What is Balancing of rotating masses?
(b) Why rotating masses are to be dynamically balanced?
(c) What is Primary unbalanced force and Secondary unbalanced force?
(d) Define (i) attractive force and (ii) hammer blow
(e) Define Swaying couple.

OR

8 A shaft carries four masses in parallel planes A, B, C and D in this order along its length. The masses at B and C are 18 kg and 12.5 kg respectively, and each has an eccentricity of 60 mm. The masses at A and D have an eccentricity of 80 mm. The angle between the masses at B and C is 100° and that between the masses at B and A is 190°, both being measured in the same direction. The axial distance between the planes A and B is 100 mm and that between B and C is 200 mm. If the shaft is in complete dynamic balance, determine: 1. The magnitude of the masses at A and D; 2. the distance between planes A and D, and 3. the angular position of the mass at D.   L4   6M

UNIT-V

9 A shaft 50 mm diameter and 3 meters long is simply supported at the ends and carries three loads of 1000 N, 1500 N and 750 N at 1 m, 2 m and 2.5 m from the left support. The Young's modulus for shaft material is 200 GN/m2 Find the frequency of transverse vibration.   L4   12M

OR

10
a) Derive the Natural Frequency of Free Torsional Vibrations   L2   6M
(a) What are the types of Vibrations?
b)   L2   6M
(b) Define Whirling speed or Critical speed
(c) Define Logarithmic decrement
(d) Define damping factor

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
ELECTRICAL MACHINES-II
(EEE)

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

UNIT-I

1	a)	Draw and explain the equivalent circuit of Induction Motor with the help of phasor diagram.	L3	7M
	b)	If an 8-pole induction motor running from a supply of 50HZ has an emf in the rotor of frequency 1.5HZ, compute the slip and speed of the motor.	L4	5M

OR

2	a)	Describe the construction of a 3-phase cage-type induction motor with neat sketches.	L2	7M
	b)	Explain the torque slip characteristics of a 3-phase induction motor.	L2	5M

UNIT-II

3	a)	Explain the procedure of no load and blocked rotor test of three phase induction motor.	L2	6M
	b)	A Three phase induction motor has a ratio of maximum torque to full load torque as 2.5:1. Determine the ratio of starting torque to full load torque if star-delta starter is used. The rotor resistance and standstill reactance per phase are 0.4Ω and 4Ω respectively.	L4	6M

OR

4	a)	Briefly explain the working of star delta starter with a neat diagram.	L2	6M
	b)	Write a short note on v/f control of 3-phase induction motor.	L2	6M

UNIT-III

5		A 3 phase, 440V, 50Hz, delta connected alternator has direct axis and quadrature axis reactances of 0.12Ω and 0.09Ω respectively. If the alternator supplies 900A at 0.8 pf lagging, calculate (a) The excitation e.m.f. neglecting saliency ($X_q = X_d$) (b) The excitation e.m.f. considering saliency. Neglect armature resistance.	L4	12M

OR

6	a)	Explain the principle of operation of a synchronous generator.	L3	6M
	b)	Derive the expression for voltage regulation when synchronous generator is supplying lagging power factor load.	L2	6M

UNIT-IV

7		Briefly discuss about the starting methods of synchronous motor with suitable diagrams.	L2	12M

OR

8		Draw and explain the phasor diagram of synchronous motor and derive the back EMF.	L2	12M

UNIT-V

9		Briefly discuss about the working and performance characteristics of permanent magnet D.C motor.	L2	12M

OR

10		Explain the working operation of Hysteresis motor and list out the applications.	L3	12M

9 a) Explain about the smith chart for finding the SWR and Reflection co-efficient.   L2   6M

A Telephone line has the following parameters: R =30 Ω/km, G =0 L=100mH/km, C=20μF/m. At 1kHz, calculate the characteristic impedance, propagation constant and velocity of the signal.   L3   6M

OR

10 a) A low lossless transmission line of 100 Ω characteristics impedance is connected to a load of 200 Ω. Calculate the voltage reflection coefficient and the standing wave ratio.   L3   6M

b) With neat sketch explain about Primary and Secondary constants of transmission line.   L2   6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
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 a) Explain about magnetic scalar and vector potential for Magneto-statics.   L1   6M

b) A Positive Y-axis (Semi Infinite Line with respect to the Origin) Carries a Filamentary Current of 2 A in the -ay Direction. Assume it is part of a large circuit. Find H at (i) A(2,3,0). (ii) B(3,12,-4).   L2   6M

OR

2 a) Define Gauss's Law. Explain briefly about Maxwell's 1st equation.   L1   6M

b) Deduce the electric field at a distance r due to an infinitely long straight line of charge with a uniform charge density of ρ_L C/m.   L4   6M

UNIT-II

3 a) Explain Biot-Savart's Law.   L2   6M

b) Determine the Magnetic Field Density due to Infinite line Current by applying Ampere's Circuit law.   L5   6M

OR

4 a) Find the Magnetic field Intensity Due to a Straight current carry ing filamentary conductor of finite length.   L1   6M

b) An infinitely filamentary wire carries a current of 2A in the +z direction. Calculate B at (-3,4,7).   L3   6M

UNIT-III

5 a) An antenna radiates in free space and E= 80 cos(500t-8z)ax V/m. Calculate ω and β.   L3   6M

b) Explain Faraday's law of electromagnetic induction and derive the Expression for Induced EMF   L5   6M

OR

6 a) Determine the Expressions for inconsistency of Ampere's law.   L5   6M

b) Explain Faraday's law of electromagnetic induction and derive the Expression for Induced EMF.   L2   6M

UNIT-IV

7 a) Explain and derive the characteristics of wave propagation in free space.   L2   6M

b) Given that E=40 cos(10^8t – 3x) ay v/m. Determine the direction propagation, velocity of the wave, wave length.   L3   6M

OR

8 a) Determine the expression for intrinsic impendence and propagation constant in a good conductor.   L2   6M

b) In lossless medium η = 40π, μ_r = 1, H=2 cos (ωt - z) $\hat{a}_x$+5sin (ωt - z) $\hat{a}_y$. Find ε_r, ω, E for the medium.   L3   6M

Q.P. Code: 19CS0511   **R19**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
OPERATING SYSTEMS
(CSE)

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

UNIT-I

1	a)	Describe Computing Environments.	L2	12M

OR

2	a)	Distinguish between Multitasking and Multi Programming.	L4	6M
	b)	What is operating system? Explain multiprogramming and time-sharing systems.	L2	6M

UNIT-II

3		Consider 3 processes P1, P2 and P3, which require 5, 7 and 4 time units and arrive at time 0, 1 and 3. Draw the Gant chart, process completion sequence and average waiting time for. i) SJF ii) FCFS	L5	12M

OR

4	a)	Define Process? Describe process State diagram.	L1	6M
	b)	Write about Threads.	L3	6M

UNIT-III

5	a)	Define process synchronization?	L1	6M
	b)	Discuss about Deadlock Avoidance.	L6	6M

OR

6	a)	What is critical section problem?	L1	6M
	b)	Write about deadlock and starvation.	L3	6M

UNIT-IV

7		Explain the following disk scheduling algorithm with proper diagram i) FCFS ii) SSTF iii) SCAN iv) LOOK v) C-SCAN.	L2	12M

OR

8	a)	Suppose that a disk drive has 5000 cylinders numbered 0 to 4999. The drive is currently serving a request at cylinder 143. The queue of pending requests in FIFO order 86,1470,913,1774,948,1509, 1022, 1750, 130 starting from current head position. What is the total distance that disk arm moves to satisfy all the pending request for FCFS and SSTF disk scheduling algorithm?	L6	6M
	b)	Write a short note on Disk management.	L3	6M

UNIT-V

9		Discuss Authentication techniques briefly.	L6	12M

OR

10	a)	List various types of file operations.	L4	6M
	b)	What is free space management technique?	L1	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
FUNDAMENTALS OF URBAN PLANNING
(Common to EEE, ME, ECE & CSE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	Draw a neat sketch of Nandyavarta type of town planning by mentioning the location of various places on it	L1	12M

OR

2	a)	Give a details account on objects of town planning	L1	8M
	b)	Explain in detail on how town are originated	L2	4M

UNIT-II

3	What is rural planning? Explain in detail	L1	12M

OR

4	a)	Describe the regional Survey? What are the topics covered in it?	L2	6M
	b)	Explain about functional survey.	L2	6M

UNIT-III

5	What are the various housing problems in India? Explain them in detail.	L2	12M

OR

6	a)	What are the various characteristics of slums?	L5	6M
	b)	Write a short note on Slum clearance and re-housing.	L1	6M

UNIT-IV

7	Discuss the factors to be examined at the time of site selection for public buildings.	L2	12M

OR

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

UNIT-V

9	Define a freeway and mention its essential features.	L1	12M

OR

10	a)	List the causes for road accidents.	L1	6M
	b)	State the measures to be taken for the safety of pedestrians on roads.	L3	6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year II Semester Supplementary Examinations Feb 2022
JAVA PROGRAMMING
(CE & ECE)

Time: 3 Hours   Max. Marks: 60

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

UNIT-I

1	(a)	Explain History and Evolution of Java?	L2	6M
	(b)	Summarize Java Buzz Words?	L2	6M

OR

2	List the Java Tokens and discuss in detail.	L6	12M

UNIT-II

3	Discuss about the static, final keywords with an example.	L6	12M

OR

4	What is an abstract class? Explain all the cases to implement abstract class.	L2	12M

UNIT-III

5	Explain Exception handling fundamentals	L2	12M

OR

6	Contract in detail about throw and throws statements with examples	L4	12M

UNIT-IV

7	List and explain any five string methods.	L1	12M

OR

8	(a)	What is Multithreading? What are the ways to create multiple threads in java.	L1	6M
	(b)	Explain about Thread Life Cycle.	L2	6M

UNIT-V

9	Write a java program to develop Login Window using AWT	L1	12M

OR

10	Write a java swing program to find the sum of two numbers.	L1	12M

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R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester (R18) Supplementary Examinations FEB 2022
DATA COMMUNICATION NETWORKING
(ECE)

Max.Marks: 60

Time: 3 hours

PART-A
(Compulsory Questions)
Answer the following; (5 X 2 = 10 Marks)

1.
(a)	Can you discriminate bandwidth and latency? Justify	2M
(b)	Define hidden node problem.	2M
(c)	Determine the mechanisms used for transition for IPv6 to IPv4 address.	2M
(d)	How would you discover MIME types and subtypes?	2M
(e)	Write the applications of Modem?	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.	a	Write brief note on the concept of framing.	5M
	b	Explain bit stuffing and byte stuffing with an example.	5M

OR

3.	a	Explain encapsulation and decapsulation methods for OSI layers.	5M
	b	Write brief note on the flow control techniques.	5M

UNIT – II

4.	a	Draw the frame format of a Token and explain.	4M
	b	Discuss the features & write down the classifications of wired LANs.	6M

OR

5.	Write short notes on	5M
	a) Cellular telephony	5M
	b) Satellite Networks	

UNIT – III

6.	a	What is subnet addressing & subnet mask?	4M
	b	Draw the frame format of IPv4 and explain each field of it	6M

OR

7.	a	Discuss the features of TCP.	5M
	b	Explain the segment format for TCP.	5M

UNIT – IV

8.	a	Discuss how simple mail transfer protocol (SMTP) works? Can multimedia messages be transmitted using SMTP? Discuss.	10M

OR

9.	a	Describe the characteristics of ATM.	5M
	b	Explain about ports and sockets in communication protocol.	5M

UNIT – V

10.	Explain the typical dial-up connection between a home user and an ISP.	10M

OR

11.	Explain the different ways of accessing the internet?	10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester (R18) Supplementary Examinations FEB 2022
DESIGN OF MACHINE ELEMENTS-II
(Mechanical Engg.)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)
Answer the following: (5 X 2 = 10 Marks)

1.
(a)	What is meant by ply in a flat belt?	L1	2M
(b)	What are the types of sliding contact bearings.	L1	2M
(c)	How is the wear of the piston rings prevented?	L1	2M
(d)	What is What's correction factor?	L2	2M
(e)	Why gear drives are superior to belt drives or chain drives?	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2. A fan is driven by belt from a motor running at 740rpm. A leather belt with 8mm thick, 250mm wide is used. The diameter of motor pulley and driven pulley are 350mm and 1370mm, the central distance is 1370mm and both pulleys are made of cast iron for which co efficient of friction is 0.35. allowable stress for belt is 2.4MPa belt density is 970kg/m³ what is the power capacity of belt.   L3   10M

OR

3. A C- clamp is to bear the force' F' applied on to it. It has a T-section as shown in fig. if the maximum tensile strength in the clamp is limited to 130MPa. Find 'F'.   L3   10M
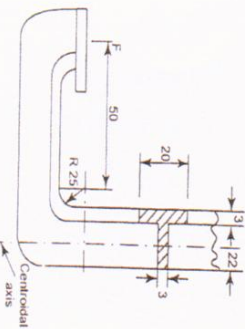
UNIT – II

4. Design a journal bearing for a centrifugal pump with the following data.   L3   10M

Diameter of journal =150mm
Load on bearing =40kN
Speed of journal =900 RPM

OR

5. The radial load on a roller bearing varies as follows a load of 50 kN is acting 20% of time at 500 rpm and a load of 40kN is acting 50% of the time at 600 rpm. In the remaining time the load varies from 40kN to 10kN linearly at 700 rpm. Select a roller bearing from NU22 series for a life of at least 4000 hours. The operating temperature is 175°C.   L3   10M

UNIT – III

6. Design a cast iron piston for a single acting four stroke engine for the following data: L4   10M
Cylinder bore = 100 mm
Stroke = 125 mm
Maximum gas pressure = 5 N/mm²
Indicated mean effective pressure = 0.75 N/mm
Mechanical efficiency = 80%
Fuel consumption = 0.15 kg per brake power per hour
Higher calorific value of fuel = 42 × 10³ kJ/kg
Speed = 2000 rpm
Tensile stress for cast iron (σ₁) = 38 MPa. Any other data required for the design may be assumed.

OR

7. Design overhung crank shaft for a 0.25 m × 0.4 m horizontal gas engine, explosion pressure2.38 MPa. weight of flywheel 16 kN, total belt pull 3 kN. When the crank is at 300, the torque on the crank shaft is maximum and the gas pressure at this position is 1.015 MPa. Length of the connecting rod is 0.95 m.   L4   10M

UNIT – IV

8. A compression spring made of alloy steel of coil diameter 75 mm and spring index 6.0, number of activecoil 20 is subjected to a load of 1.2 kN. Calculate. (i) The maximum stress developed in the coil.(ii) The deflection produced. (iii) The spring rate.   L3   10M

OR

9. A bumper consisting of two helical steel springs of circular section brings to rest, a railway wagon of mass 1500 kg and moving at 1.2 m/s. While doing so, the springs are compressed by 150 mm. The mean diameter of the coils is 6 times the wire diameter. The permissible shear stress is 400 MPa. Determine: L3   10M
   (i) Maximum force on each spring.
   (ii) Wire diameter of the spring.
   (iii) Mean diameter of the coils and
   (iv) Number of active coils. Take G = 0.84 x 105MPa.

UNIT – V

10. A pair of gears connecting parallel shafts is to transmit 415 N-m torsional moment at 2800 rpm of the pinion. The teeth are to be 20⁰ stub of heat treated alloy steel. The width of face is 38mm. The driver gear rotates at 1800 rpm. Select necessary module and check for wear.   L4   10M

OR

11. A pair of helical gears in a milling machine is used to transmit 4.5 kW at 1000 rpm of the pinion and the velocity ratio is 3:1. The helix angle of the gear is 15⁰ and both gears are made of steel C45. The gears are 20⁰ FDI and the pinion is to have minimum of 20 teeth. The gear is to work 8 hrs/day for 3 years. Design the helical gears. Take the required hardness for both gears is more than 350 BHN   L4   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester (R18) Supplementary Examinations February 2022

ENVIRONMENTAL ENGINEERING
(CIVIL)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)
Answer the following; (5 X 2 = 10 Marks)

1.
(a)	What is meant by per capita demand?	L1	2M
(b)	Define pH value	L4	2M
(c)	List four factors that affect DWF	L1	2M
(d)	Define BOD and COD	L1	2M
(e)	What is mean by oxygen sag curve?	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)

UNIT – I

2. The populations of 5 decades from 1960 to 2000 are given below in table. Find out the population 2010, 2020 & 2030 beyond the last known decade. By (a) Arithmetic increase method (b) Geometrical method   L3 10M

Year	1960	1970	1980	1990	2000
Population	25000	28000	34000	42000	47000

OR

3. Population of a town as obtained from the census reports is as below: Estimate the population of the town by 2020 & 2030 by Incremental Increase Method & Decreasing Rate Method   L3 10M

Year	1980	1990	2000	2010
Population	55500	63700	71300	79500

UNIT – II

4. Discuss different methods of disinfection of water in water treatment plant.   L2 10M

OR

5. (a) The maximum daily demand at a water purification plant has been estimated as 12 million litres per day. Design the dimensions of a suitable sedimentation tank for the raw supplies, assuming a detention period of 6 hours and the velocity of flow as 20cm per minute.   L3 5M

(b) Determine the dimensions of a set of rapid sand filters for treating water required for a population of 10000 with an average rate of demand 200 lpcd   L3 5M

UNIT – III

6. (a) What are the requirements of a distribution system?   L1 4M

(b) Write short notes on methods of distribution system.   L1 6M

OR

7. A certain district of a city has a projected population of 80000 residing over an area of 70 hectares. Find the design discharge for the sewer line, for the following data:
(i) Rate of water supply = 200 LPCD
(ii) Average impermeability coefficient for the entire area =0.3
Time of concentration = 50 minutes.   L3 10M

UNIT – IV

8. Explain with the help of neat sketch, the construction and working of trickling filter.   L2 10M

OR

9. Compare between the standard rate filter and high rate filter.   L2 10M

UNIT – V

10. (a) What is soak pit and why it is necessary?   L1 5M

(b) What do you understand by sludge thickening?   L1 5M

OR

11. Design a septic tank for 200 persons assuming water supply as 120 lpcd   L4 10M

b) Write short notes on methods of c

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester (R18) Supplementary Examinations February 2022
HEAT AND MASS TRANSFER
(Mechanical Engg.)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)
   (a)   What is Fourer's law of heat conduction?   L1   2M
   (b)   Explain the significance of critical radius of insulation for steam pipes   L4   2M
   (c)   What is the significance of Reynolds and Prandtl numbers used in forced convection? L1   2M
   (d)   Explain the mechanisms of boiling and condensation heat transfer   L1   2M
   (e)   What is a black body?   L1   2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2. (a) Explain various modes of heat transfer   L3   6M
    (b) Calculate the rate of heat transfer per unit area through a copper plate 45 mm thick,   L4   4M
         whose one face is maintained at 350 ^{0}C and the other face at 50 ^{0}C. Take thermal
         conductivity of copper as 370 W/m ^{0}K.

OR

3.   Derive the generalised conduction equation in cartesian coordinates   L3   10M

UNIT – II

4.   Obtain an expression for temperature distribution and heat transfer through a hollow   L2   10M
        cylinder

OR

5. (a) A spherical shaped vessel of 1.4 m diameter is 90 mm thick. Find the rate of heat   L3   5M
         leakage, if the temperature difference between the inner and outer surface is 220 ^{0}C.
         Thermal conductivity of the material of the sphere is 0.083 W/m ^{0}K.
    (b) What is lumped heat analysis? Explain the concept based on thermal network   L2   5M

UNIT – III

6. (a) Distinguish between the free and forced convective heat transfer mechanisms   L1   6M
    (b) Explain the significance of Nusselt number in convective heat transfer   L2   4M

OR

7.   Air stream at 24 ^{0}C is flowing at 0.4 m/s across a 100 W bulb at 130 ^{0}C. If the bulb is   L3   10M
        approximately by a 65 mm diameter sphere. Calculate
             (i) The heat transfer rate
             (ii) The percentage of power lost due to convection

UNIT – IV

8.   Explain different regimes of pool boiling for water with the help of boiling curve   L2   10M

OR

9.   Derive an expression for Logarithmic Mean Temperature Difference of (LMTD) a   L2   10M
        counter flow heat exchanger

UNIT – V

10. (a) The effective temperature of the body having an area of 0.12 m² is 527 ºC. Calculate the   L4   6M
         following
             i)   The total rate of energy emission
             ii) ii) The wave length of maximum monochromatic emissive power
    (b) Explain the significance of Wein's displacement law applied for a black body   L2   4M

11. (a) Explain various modes of mass transfer   L2   6M
    (b) What is mass transfer coefficient?   L2   4M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester (R18) Supplementary Examinations FEB 2022
SOFTWARE ENGINEERING
(CSE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)

(a)	Name the five phases of Unified process?	L1	2M
(b)	List the seven tasks of Requirements Engineering?	L4	2M
(c)	Define cohesion and coupling?	L1	2M
(d)	What are the three golden rules in interface design?	L1	2M
(e)	What are the four levels of testing?	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.	Explain in detail about the waterfall model and incremental model and problems encountered with them.	L3	10M

OR

3.	Write in detail about the nature of software.	L3	10M

UNIT – II

4.	Illustrate Eliciting Requirements in software requirements gathering.	L2	10M

OR

5.	Discuss flow -Based Modeling with suitable examples.	L3	10M

UNIT – III

6.	Describe a Design model with various kinds of elements.	L1	10M

OR

7.	What is software architecture ? Describe in detail different types of software architectural styles with illustrations.	L3	10M

UNIT – IV

8.	Elaborate golden rules to form the basis for a set of user interface design principles.	L2	10M

OR

9.	Discuss detailed notes on WebApp Design Quality and their goals.	L2	10M

UNIT – V

10.	Distinguish between Validation testing and System testing.	L1	10M
11.	Compare white box testing and Black box testing.	L4	10M

Q.P. Code: 18EC0419 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester (R18) Supplementary Examinations February 2022
ANTENNAS AND WAVE PROPAGATION
(ECE)

Time: 3 hours
Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
    (a) Define Radiation Intensity of an antenna. | L1 | 2M
    (b) What is the significance of parasitic elements? | L1 | 2M
    (c) List the applications of Micro-strip antenna. | L1 | 2M
    (d) What is the need for antenna arrays? | L1 | 2M
    (e) Write the definition of Skip distance. | L1 | 2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2. Derive an expression for Electric and Magnetic Field radiated by Quarter Wave Monopole and Sketch its Field Strength pattern. | L3 | 10M

OR

3. A dipole having a length of 3 cm is operated at 1 GHz. The efficiency factor K=0.6. calculate the radiation resistance, antenna gain and effective aperture | L3 | 10M

UNIT – II

4. (a) Write short notes on Horn antenna. | L1 | 3M
   (b) Design Yagi-Uda antenna of six elements to provide a gain of 12dB if the operating frequency is 200 MHz. | L6 | 7M

OR

5. (a) Explain the design considerations of pyramidal horn antenna. | L2 | 5M
   (b) Explain about the helical antenna geometry, Normal mode of radiation and its applications | L2 | 5M

UNIT – III

6. (a) Write the advantages and limitations of micro strip antennas. | L1 | 4M
   (b) Explain Gain measurement by direct comparison method. | L1 | 6M

OR

7. (a) Explain near & far fields with respect to antenna measurements. | L5 | 5M
   (b) Explain Cassegrain Feed system and give its advantages | L2 | 5M

UNIT – IV

8. (a) Compare the Broad side array and end fire array | L5 | 7M
   (b) What are the different cases of arrays of two point sources? | L1 | 3M

OR

9. Derive the expression for far field pattern of an array of two isotropic point sources at equal amplitude & opposite phase. | L4 | 10M

UNIT – V

10. Draw and Explain the structure of Ionosphere with its typical electron density variation Characteristics | L5 | 10M

OR

11. (a) Explain Multi-hop propagation. | L5 | 4M
    (b) Explain different modes of Wave Propagation. | L2 | 6M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester (R18) Supplementary Examinations Feb 2022
MICROPROCESSORS & MICROCONTROLLERS
(ECE & EEE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)
Answer the following; (5 X 2 = 10 Marks)

1.			
(a)	Calculate the address lines required for an 8 KB memory chip	L1	2M
(b)	Define machine cycle and instruction cycle	L1	2M
(c)	List out the 8051 μC five interrupts	L1	2M
(d)	Compare RLC A and RRC A	L1	2M
(e)	Give different methods to implement switch debouncing	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.	a) Write short notes on output devices	L1	5M
	b) Compare static RAM and Dynamic RAM	L2	5M
	OR		
3.	Explain how computers are classified from large computers to single chip microcontrollers	L3	10M

UNIT – II

4.	a) Draw the pin diagram of 8085 μP	L2	5M
	b) Define the following pins: i) READY ii) ALE iii) RESET OUT iv) HOLD & HLDA.	L2	5M
	OR		
5.	a) Explain the concept of De-multiplexing the Bus AD7-AD0	L3	5M
	b) Explain what operation will take place when the following instructions are executed: i) RAL ii) RLC iii) DAD	L2	5M

UNIT – III

6.	Mention the various registers present in 8051 μC and explain their functionality in detail	L3	10M
	OR		
7.	a) Describe how the memory is organized in 8051 μC in detail	L4	5M
	b) Describe the operation of timers present in 8051μC	L4	5M

UNIT – IV

8.	a) Write an assembly program of 8051 μC to subtract two 8-bit numbers and store the result in a memory location.	L3	5M
	b) List various addressing modes of 8051 microcontroller and explain them with an example each	L2	5M

	OR		
9.	a) Write an assembly program of 8051 μC to divide two 8-bit numbers and store the result in a memory location	L3	5M
	b) Explain the arithmetic Instructions of 8051 μC with an example	L2	5M

UNIT – V

10.	Describe with a schematic, the scanning of the 4x4 matrix keyboard in an 8051 based system and identifying the key pressed.	L3	10M
	OR		
11.	Design and explain the implementation of 4-way traffic control system using 8051 microcontroller	L4	10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B. Tech III Year II Semester (R18) Supplementary Examinations Feb 2022
TRANSPORT ENGINEERING
(CIVIL)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)
   (a) What are the design issues in highway geometrics?   L2   2M
   (b) Define traffic volume and traffic density   L1   2M
   (c) Write short note on rigid pavement.   L1   2M
   (d) Write short note on sleepers and Ballast.   L1   2M
   (e) What is Gradient?   L2   2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.   Develop the equation form for Extra widening at transition curve.   L3   10M
                                    OR
3.   Develop the equation forms for designing the different vertical curves. L3   10M
UNIT – II
4.   Discuss the guidelines of IRC method of Signals.   L3   10M
                                    OR
5.   Explain about the classification of Traffic Signs.   L3   10M
UNIT – III
6.   What are the failures of Rigid Pavements? Explain.   L4   10M
                                    OR
7.   Compare various aspects of flexible and rigid pavement.   L4   10M
UNIT – IV
8.   What is Ballast? What are the different types and enumerate the   L2   10M
     requirements of Good ballast.
                                    OR
9.   What is permanent way? Explain functions of various components briefly? L2   10M
UNIT – V
10. (i) Define "Cant Deficiency". What are the permitted cant deficiency values L4   4M
     for different gauges?
     (ii) What are the objects of providing transition curves on railways? L2   6M
                                    OR
11. Compute the maximum permissible speed for the following data on a curve L4   10M
     of high speed B.G for the following data. Degree of curve = 1.2, Amount of
     super elevation = 8cm, Length of transition curve = 150 m, Maximum
     sanctioned speed likely to be 135kmph.

Q.P. Code: 18CE0116

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester (R18) Supplementary Examinations Feb 2022
METROLOGY & MEASUREMENTS
(ME)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)

(a)	Define limits and tolerances.	L1	2M
(b)	Draw the BIS symbol for surface roughness.	L4	2M
(c)	List out tools required for machine alignment.	L1	2M
(d)	What is a piezoelectric sensor?	L1	2M
(e)	Define Calibration.	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.   Construct the conventional diagram of limits and fits and explain all terms.   L3   10M

OR

3.   Describe briefly the principal features of the Indian standard System of limits   L3   10M
     and fits.

UNIT – II

4.   State the principle of a micrometer. Explain with neat Sketch an outside   L2   10M
     micrometer.

OR

5.   Explain with the help of neat sketches the principle and construction of an   L3   10M
     auto collimator.

UNIT – III

6.   With the help of an illustration, explain any four alignment tests on milling   L1   10M
     machine.

OR

7.   Explain with neat sketch the gear tooth profile measurement.   L3   10M

UNIT – IV

8.   Prove variable Capacitance Transducer is the most common form of   L2   10M
     measurement of displacement?

OR

9.   Explain working of Electrical Strain Gauge.   L2   10M

UNIT – V

10. Discuss in detail about the principle and working of thermo couple with neat   L1   10M
     sketch.

11. What are the methods employed for the measurement of torque? Sketch a   L4   10M
     strain gauge torque meter and elaborate it.

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester (R18) Supplementary Examinations Feb 2022
FOUNDATION ENGINEERING
(CIVIL)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

Answer the following: (5 X 2 = 10 Marks)

1.
(a)	List the various assumptions of coulomb's wedge theory.	L1	2M
(b)	Define Net allowable bearing pressure.	L1	2M
(c)	Write short notes on (a) Displacement piles (b) Non Displacement piles	L1	2M
(d)	List the various types of Caisson.	L1	2M
(e)	Define (i)Free vibration (ii) Forced vibration	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2. A cantilever retaining wall of 7mts height retains sand. The properties of sand are e=0.5,φ=30° and G=2.7m.Using Rankines theory Determine the active earth pressure at the base when the backfill is (i) dry (ii) saturated (iii)submerged and also the resultant active force in each case.   L3   10M

OR
UNIT – II

3. Explain various types of retaining walls with neat sketch.   L2   10M

OR

4. What are different types of shallow foundations? Explain any 2 with the help of neat sketches.   L2   10M

UNIT – II

5. A strip footing of 2m width is founded at a depth of 4m below the ground surface. Determine the net ultimate bearing capacity, using a) Terzaghi's equation (Nc=5.7, Nγ=1.0, Nq=0.0) b) Skempton's equation c) IS Code (Nc=5.14). The soil is clay (φ=00, C-10kN/m²).The unit weight of soil is 20kN/m².   L3   10M

OR
UNIT – III

6. Explain in detail In-situ penetration tests for pile capacity.   L1   10M

OR

7. A precast concrete pile (35cm x 35cm) is driven by a single –acting steam hammer. Estimate the allowable load using (a) Engineering News Record Formula (F.S.=6) (b)Hiley Formula (F.S.=4) and (c) Danish Formula (F.S. =4). Use the following data.   L3   10M

(i)	Maximum rated Energy	= 3500kN-m
(ii)	Weight of hammer	= 35kN
(iii)	Length of pile	= 15m
(iv)	Efficiency of hammer	= 0.8
(v)	Coefficient of resistitution	= 0.5
(vi)	Weight of pile cap	= 3kN
(vii)	No of blows for last 2.54mm	= 6
(viii)	Modulus of elasticity of concrete = 2 x 10⁷kN/m²	

Assume any other data, if required. Take the weight of pile as 73.5kN.

R18

UNIT – IV

8. Explain the construction of open caisson with the help of neat sketch.   L2   10M

OR

9. Explain various steps involved in sinking operation of wells with neat sketch.   L2   10M

UNIT – V

10. Explain the determination of natural frequency by using theory of vibrations.   L2   10M

OR

11. A foundation block of weight 30kN rests on a soil for which the stiffness may be assumed as 25000kN/m. The machine is vibrated vertically by an exciting force of 3.0 sin (30t) kN. Find the natural frequency, natural period, natural circular frequency and the amplitude of vertical displacement. The damping factor is 0.50.   L3   10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B Tech III Year II Semester (R18) Supplementary Examinations Feb 2022

MODERN CONTROL THEORY
(EEE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)
Answer the following; (5 X 2 = 10 Marks)

1.
(a) What are the advantages of state space representation? Compare with transfer function representation.   L1 2M
(b) Define Controllability. What are the tests to find the controllability of a system?   L4 2M
(c) What is the necessary condition to be satisfied for design of state observer?   L1 2M
(d) What are the methods available for the analysis of nonlinear system?   L1 2M
(e) State Lyapunov instability theorem.   L5 2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)

UNIT – I

2. Obtain a state space equation and output equation for the system defined by $\frac{Y(s)}{U(s)} = \frac{2s^3+s^2+s+2}{s^3+4s^2+5s+2}$ L1 10M

OR

3. For a system represented by state equation $\dot{x}(t) = Ax(t)$. The response is $x(t) = \begin{bmatrix} e^{-2t} \\ -2e^{-2t} \end{bmatrix}$ when $x(0) = \begin{bmatrix} 1 \\ -2 \end{bmatrix}$ & $x(t) = \begin{bmatrix} e^{-t} \\ -e^{-t} \end{bmatrix}$ where $x(0) = \begin{bmatrix} 1 \\ -1 \end{bmatrix}$. Determine the system matrix A and the state transition matrix.   L5 10M

UNIT – II

4. A System is represented by the state model:
$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 1 & 3 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 & 1 \\ 1 & 0 \\ 0 & 1 \end{bmatrix} U; \quad y(t) = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$$
Check whether system is (a) Completely Controllable (b) Completely Observable.   L1 10M

OR

5. Consider the system $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 3 & 1 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$ the output is given by

$Y = \begin{bmatrix} 1 & 1 & 1 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$.

(a) Show that the system is not completely observable
(b) Show that the system is completely observable if the output is given by $\begin{bmatrix} y_1 \\ y_2 \end{bmatrix} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$.   L1 10M

UNIT – III

6. What is state observer? Explain about state observer.   L1 10M

OR

7. The state model is given by $\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 1 \\ -2 & -3 & 0 \\ 0 & 2 & -3 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} 0 \\ 2 \\ 0 \end{bmatrix} U; \quad Y = \begin{bmatrix} 1 & 0 & 0 \end{bmatrix}\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$. Convert the state model to controllable phase variable form.   L2 10M

UNIT – IV

8. A linear second order servo is described by the equation $\ddot{e} + 2\zeta w_n \dot{e} + w_n^2 e = 0$ where, $\zeta = 0.15$ $w_n = 1\ rad/sec$ $e(0)=1.5$ and $\dot{e}(0) = 0$. Determine the singular point construct the phase trajectory using method of isoclines.   L5 10M

OR

9. Derive the describing function of relay with dead zone.   L6 10M

UNIT – V

10. Use Krasovskii's theorem to show that the equilibrium state x=0 of the system described by $\dot{x}_1 = -3x_1 + x_2$, $\dot{x}_2 = x_1 - x_2 - x_2^3$ is asymptotically stable in the large.   L2 10M

OR

11. Examine the stability of the system described by the following equation by Krasovskii's theorem $\dot{x}_1 = -x_1$ $\dot{x}_2 = x_1 - x_2 - x_2^3$ L2 10M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year II Semester (R18) Supplementary Examinations Feb 2022

MICROWAVE THEORY & TECHNIQUES
(ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

Answer the following; (5 X 2 = 10 Marks)

1.
(a) Define phase velocity and group velocity — L1 2M
(b) Write any two applications of Rectangular Waveguide. — L1 2M
(c) What is E-plane Tee — L1 2M
(d) Classify the Microwave Tubes — L1 2M
(e) What is reflection Coefficient — L1 2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)

UNIT – I

2. a A rectangular metal wave guide filled with a dielectric material of relative permittivity $\varepsilon_r = 4$ has the inside dimensions $3.0cm \times 1.2cm$. Evaluate the cut off frequency for the dominant mode — L5 4M

   b Write about the features of TEM, TE and TM modes in the waveguide using a neat sketch. — L5 6M

OR

3. Show that Wavelengths and Impedance in transverse electric (TE) waves are related in terms of cut-off frequency. — L2 10M

UNIT – II

4. Prove that Transverse Electric(TE)waves propagate through rectangular waveguides — L5 10M

OR

5. a A TE_{11} mode is propagating through a circular waveguide. The radius of the guide is 5cm and the guide contains an air dielectric. Determine (i) guide wavelength at 3GHz and (ii) the wave impedance in the guide. — L5 4M

   b With a neat sketch explain the operation of Isolator — L2 6M

UNIT – III

6. A State properties of S-matrix — L2 5M
   B Derive the S-matrix of E-Plane Tee — L2 5M

OR

7. With a neat sketch explain the following
(a) Precision variable attenuator — L2 5M
(b) Rotary vane attenuator — L2 5M

UNIT – IV

8. With the help of neat sketch explain the principle of operation of Two cavity Klystron — L2 10M

OR

9. Explain the principle of operation of Reflex Klystron using a neat sketch and explain its modes of oscillation — L2 10M

UNIT – V

10. A Discuss briefly on the two methods for microwave attenuation measurement using experimental setup. — L2 8M
    B What is slotted line and why it is used. — L2 2M

OR

11. a Write about the functions of different blocks in a microwave bench set up — L2 6M
    b Explain any one method of microwave power measurement with a block diagram — L2 4M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester (R18) Supplementary Examinations Feb 2022
PYTHON PROGRAMMING
(Common to CIVIL, EEE, MECH & ECE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)

   (a) Define REPL   L1   2M
   (b) When should you use the "break" in Python?   L4   2M
   (c) What is the return keyword used for in Python?   L1   2M
   (d) What are Errors and Exceptions in Python programs?   L1   2M
   (e) Compare Iterator and Iterable.   L1   2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.   Illustrate the input and output statements with example.   L3   10M

OR

3.   Create python program for the following   L3   10M
        i) Prime number or not   ii) Odd or even

UNIT – II

4.   Classify various types of operators in Python and write any 4 types of   L2   10M
      operators.

OR

5.   Write a Python program to find maximum among three numbers.   L3   10M
      Describe Python jump statements with examples.

UNIT – III

6. (a) Express function to do all arithmetic operations.   L1   5M
   (b) What are formal and actual arguments explain with example?   L2   5M

OR

7. (a) Define class and object with example code.   L3   5M
   (b) Write about self-variable with code.   L2   5M

UNIT – IV

8.   What is module? How to create a module explain with an example. L2   10M

OR

9. (a) List some few common Exception types and explain when they occur.   L3   5M
   (b) Write a small code using try-except-else-finally statement in python. L2   5M

UNIT – V

10.   Describe in detail about Iterators and Generators with an example.   L1   10M

OR

11.   Explain about Functional Programming.   L4   10M

Q.P. Code: 18EC0449

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester (R18) Supplementary Examinations Feb 2022
INTRODUCTION of IOT
(EEE & CSE)

Time: 3 hours

Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)

(a)	Define IoT?	L1	2M
(b)	List majorly used IoT controllers by industries	L4	2M
(c)	Define Software defined Network	L1	2M
(d)	Differentiate between Arduino and Raspberry pi	L4	2M
(e)	What is the use of SPI and I2C interfaces on raspberry pi?	L1	2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2. Explain briefly about the application layer protocols of IoT.   L5   10M

OR

3. Explain in brief about the Enabling Technologies of IOT   L5   10M

UNIT – II

4. Describe how the environment can be more protected with the help of IoT   L2   10M
technology in the following categories:
  (i) Air pollution monitoring   (ii) Noise pollution monitorin
  (iii) Forest fire detection   (iv) River flood detection

OR

5. Explain how IoT technology used to enable the agricultural industry to increase   L5   10M
operational efficiency, lower costs, reduce waste, and improve the quality of
their yields

UNIT – III

6. Briefly explain the M2M system architecture with the help of neat diagram.   L3   10M

OR

7. a) List out the various steps involved in IoT system design methodology.   L4   05M
   b) What is the difference between a Physical entity and virtual entity?   L1   05M

UNIT – IV

8. Design an automatic refrigerator light system with LED, switch & raspberry pi   L6   10M
and write a python program to support the working of that design.

OR

9. a) What is the use of SPI and I2C interfaces on raspberry pi?   L1   05M
   b) Illustrate how to interface a switch to raspberry pi?   L2   05M

UNIT – V

10. a) Draw the deployment structure for the home automation system and explain it?   L6   05M
    b) Define controller service of the home automation system with diagram   L1   05M

(OR)

11. a) Implement the air pollution monitoring system using the Web Socket   L5   5M
approach
    b) Implementation of smart irrigation system   L5   5M

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year II Semester (R18) Supplementary Examinations Feb 2022
ELEMENTS OF ROAD TRAFFIC SAFETY
(Common to ME,ECE,EEE & CSE)

Time: 3 hours   Max.Marks: 60

PART-A
(Compulsory Questions)

1.   Answer the following; (5 X 2 = 10 Marks)
   (a) How the different factor of roads contribute in accidents?   L1   2M
   (b) What are the rules for pedestrians traffic?   L1   2M
   (c) Define route numbering.   L2   2M
   (d) What are the types of co-ordinate signal system?   L1   2M
   (e) Illustrate about directional arrow.   L2   2M

PART- B
(Answer all five units, 5 x 10 =50 Marks)
UNIT – I

2.   Analyze various road geometric design elements and how they are related to   L4   10M
     cause of Road accidents.

OR

3.   Develop your answer about the following elements in view of causing road   L3   10M
     accidents.
     a) The vehicle
     b) Weather
     c) Speed

UNIT – II

4.   Explain about various rules adopted in concern to traffic for cyclist and   L2   10M
     pedestrians.

OR

5.   Identify various common methods in design of on-street parking with sketches. L3   10M

UNIT – III

6.   Give a detailed discussion about different types of traffic signs.   L2   10M

OR

7.   Describe about Location, Height & Maintenance of traffic signing.   L2   10M

UNIT – IV

8.   What is meant by traffic signals? What are the advantages & disadvantages of it? L1   10M

OR

9.   What is meant by Warrants for signals?. Explain in detail about different types L2   10M
     warrants laid by I.R.C.

UNIT – V

10. What are the functions of road markings & List out the various types of road   L1   10M
     markings?

11. Briefly explain about illumination of traffic rotaries with detailed sketch.   L2   10M