Code: 18EC0401 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B. Tech II Year I Semester (R18) Supplementary Examinations Aug- 2021

ELECTRONIC DEVICES

(ECE)

Time: 3 hours Max.Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) What are the various breakdown mechanisms? 2M
   (b) Mention the basic applications of conventional and Zener diode? 2M
   (c) Define Stability factor with expression. 2M
   (d) What is the hybrid or h parameters? Why are they so called? 2M
   (e) Differentiate between BJT and JFET 2M

PART- B

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

UNIT - I

2. Define Clipper and Clamper? Explain the concept of Positive clipper and Clamper. 10M

OR

3. (a) For a Ge diode, the I_0=2μA and the voltage of 0.26V is applied. Calculate the forward and reverse dynamic resistance values at room temperature. 5M
   (b) Explain the effect of Temperature on V-I characteristics of P-N junction diode. 5M

UNIT - II

4. Explain the operation of Half Wave Rectifier with necessary graphs and The Half wave rectifier circuit is supplied with a 230 V AC through 3:1 step down transformer with a resistive load of 10 KΩ, the diode forward resistance is 75 Ω and transformer secondary winding resistance 10 Ω. Calculate Vm, Im, Iav, Vav and PDC. 10M

OR

5. Compare the characteristics of PN junction diode, Zener Diode and Tunnel diode. 10M

UNIT - III

6. (a) Explain the operation of CB Configuration of BJT and its input and output characteristics briefly. 7M
   (b) In CB configuration, the value of α=0.98A. A voltage drops of 4.9V is obtained across the resistor of 5KΩ when connected in collector circuit. Find the base current. 3M

OR

7. (a) What is Biasing? Explain the need of it. List out different types of biasing methods. 10M
   (b) Explain the concept of Thermal runaway and Thermal stabilisation.

UNIT - IV

8. Analyze general transistor amplifier circuit using h-parameter model. Derive the expressions for A_I, A_V, R_I, R_0. 10M

OR

9. (a) For the emitter follower circuit with Rs= 0.5K and R_L =5K, calculate A_I, A_V, R_I and R_0. Assume hfc = 50, hic = IK, hoc = 25 μA. 5M
   (b) Design single stage RC Coupled Amplifier. 5M

UNIT - V

10. (a) Explain construction and operation of n-channel JFET with its characteristics. 5M
    (b) Explain Biasing methods of FET amplifier. 5M

OR

11. Explain construction and operation of n-channel Enhancement and Depletion mode MOSFET with its characteristics. 10M

Code: 18HS0835 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations August 2021

PROBABILITY & STATISTICS

(Common MECH & CSE)

Time: 3 hours Max.Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) State Bayes theorem. 2M
   (b) Define Poisson distribution. 2M
   (c) Obtain mode of the values 10,12,15,20,12,16,18,15,12,10,16,20,12,24. 2M
   (d) Define parameters statistics 2M
   (e) Write the formula for Student's t-test for difference of means. 2M

PART- B

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

UNIT - I

2. a) A class consists of 6 girls and 10 boys. If a committee of 3 is chosen at random from the class, find the Probability that (i)3 boys are selected (ii)exactly 2 girls are selected 6M
   b) Two cards are selected at random from 10 cards numbered 1 to 10. Find the probability that the sum is even if (i) The two cards are drawn together. (ii) The two cards drawn one after other with replacement. 4M

OR

3. In a certain college 25% of boys and 10% of girls are studying mathematics. The girls Constitute 60% of the student body. (a) What is the probability that mathematics is being studied? (b) If a student is selected at random and is found to be studying mathematics, find the probability that the student is a girl? (c) a boy 10M

UNIT - II

4. a) Derive mean and variance of poisson distribution. 10M
   b) Derive mean and variance of Binomial distribution.

OR

5. Find the mean and variance of a Normal distribution in which 7% of items are under 35 and 89% are under 63. 10M

UNIT - III

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

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. a) Calculate correlation coefficient to the following data 10M

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

   b) Obtain the rank correlation coefficient for the following data :

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

UNIT - IV

8. a) Find the curve of best fit of the type $y = ae^{bx}$ to the following data by method of least squares 5M

X	1	5	7	9	12
Y	10	15	12	15	21

   b) Fit a straight line $y = ax + b$ for the following data 5M

X	6	7	7	8	8	8	9	9	10
Y	5	5	4	5	4	3	4	3	3

OR

9. a) A sample of 400 items is taken from a population whose standard deviation is 10. The mean of the sample is 40.Test whether the sample has come from a population with mean 38. 5M
   b) The means of two large samples of sizes 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as drawn from the same population of standard deviation 2.5 inches . 5M

UNIT - V

10. A random sample of 10 boys had the following I.Q's : 10M
    70,120,110,101,88,83,95,98,107 and 100
    a) Do these data support the assumption of a population mean I.Q of 100?
    b) Find a reasonable range in which most of the mean I.Q values of samples of 10 boys lie.

OR

11. The nicotine in milligrams of two samples of tobacco were found to be as follows. 10M

Sample A	24	27	26	23	25	--
Sample B	29	30	30	31	24	36

Can it be said that the two samples have come from the same normal population.

Code: 18EC0443 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester (R18) Supplementary Examinations Aug-202
ANALOG ELECTRONIC CIRCUITS
(EEE & CSE)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) Mention the advantages of Full Wave Rectifier. 2M
   (b) What are the different configurations of BJT? 2M
   (c) Why a Field Effect Transistor is called so? 2M
   (d) Define Virtual ground property of an OP-AMP 2M
   (e) Draw the freq response of the LPF. 2M

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

2. Derive the expressions for Average DC current, Average DC Voltage, RMS Value of Current, DC Power Output and AC Power Input of a Half Wave Rectifier. 10M

OR

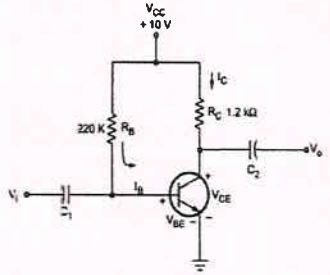
3. (a) Discuss the working of inductor filter with circuit diagram. 5M
   (b) Calculate the ripple factor for a π type filter, employing 10H choke and two equal capacitors 16μF each and fed from a full wave rectifier and 50Hz mains. The load resistance is 4KΩ. Draw the neat circuit diagram. 5M

UNIT - II

4. With neat diagram, discuss Voltage Divider bias of BJT and derive the expression for its stability factor. 10M

OR

5. (a) For the circuit shown in the Figure, calculate I_B, I_C, V_{CE}, V_B, V_C and V_{BC}. Assume that $V_{BE} = 0$ and $\beta = 50$. 5M



   (b) Compare CB, CE, and CC configurations of BJT. 5M

UNIT - III

6. Discuss the operation and characteristics of n-channel depletion type MOSFET with diagram. 10M

OR

7. Derive input impedance, output impedance and voltage gain of JFET Common Drain amplifier with neat diagram. 10M

UNIT - IV

8. (a) Draw the various functional blocks of an operational amplifier IC. Explain each block. 5M
   (b) Draw the equivalent circuit diagram of Op amp and derive the expression for gain of inverting amplifier. 5M

OR

9. (a) What is frequency compensation and explain how the frequency response is varied with respect to compensation network 5M
   (b) Design an inverting amplifier with gain A= 10 5M

UNIT - V

10. (a) Draw and explain successive approximation type ADC? 5M
    (b) The basic step of a 9-bit DAC is 10.3 mV. If "000000000" represents 0 V. What output is produced if the input is "101101111"? 5M

OR

11. Draw the circuit diagram of Dual Slope ADC and explain its working with neat sketches 10M

Code: 18EC0402 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations Aug- 2021
DIGITAL SYSTEM DESIGN
(Electronics and Communication Engineering)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) Determine the value of base 'X' in $(225)_X = (341)_8$. 2M
   (b) Simplify the given Boolean function $F(X,Y,Z) = \sum(0,2,4,6,7)$. 2M
   (c) What is edge-triggered flip-flop? 2M
   (d) Define noise margin 2M
   (e) Define Data flow model. 2M

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

2. i) Convert 2753 octal to its decimal equivalent. 10M
   ii) Convert 0.645637 decimal numbers to its hexadecimal equivalent.
   iii) Convert (A3B)16 to its octal equivalent.
   iv) Convert 812.8288062 decimal numbers to its octal equivalent.

OR

3. (a) Simplify the Boolean expressions to minimum number of literals: 5M
   X'+ XY + XZ'+ XYZ'
   (b) Express the Boolean function F= A+B'C as a sum of minterms 5M

UNIT - II

4. i) Draw and explain the working of a decoder. 5M
   ii) Draw and explain the working of a magnitude comparator 5M

OR

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

UNIT - III

6. (a) Explain the principle of clock generation with neat diagram 5M
   (b) Give the characteristic table, Truth table, characteristic equation and excitation table for T FF. 5M

OR

7. (a) Draw the circuit diagram of J-K flip flop with positive edge triggering and explain its operation with the help of a truth table 5M
   (b) Draw the basic flip flop circuit with NOR gates. Explain its operation 5M

UNIT - IV

8. Generate the following Boolean function with PAL with 4 inputs and 4 outputs 10M
   (i)Y_3= a'bc'd+a'bcd'+abc'd (ii)Y_2=a'bcd' | a'bcd | abcd
   (iii)Y_1=a'bc'+a'bc+ab'c+abc' (iv)Y_0=abcd.

OR

9. (a) Compare between Different CMOS Logic families 5M
   (b) Emitter coupled logic (ECL). 5M

UNIT - V

10. (a) Explain the structure of a VHDL program 5M
    (b) Explain about Data Types in VHDL 5M

OR

11. Design the logic circuit and write a data-flow style VHDL program for the following function. 10M
    $F(A,B,C,D) = \sum (1,5,6,7,9,13) + d(4,15)$

Code: 18EE0203 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester (R18) Supplementary Examinations Aug-2021
ELECTRO MAGNETIC FIELDS
(EEE)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) What is DEL operator and write its applications? 2M
   (b) Write Maxwell's first equation in integral and point form? 2M
   (c) In a certain region, D = 420 nC/m² and $\varepsilon = 5.2\varepsilon_0$. Find χ_e ,E and P? 2M
   (d) What is vector magnetic potential? 2M
   (e) Define skin depth? 2M

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

2. A field is given as $G=[25/(x^2+y^2)](xa_x + ya_y)$, Find: (a) a unit vector in the direction of G at P(3,4,-2); (b) the angle between G and ax at P; (c) the value of double integral on the plane y=7. 10M

OR

3. The vector from the origin to point A is given as (6,-2,-4), and the unit vector directed from the origin toward point B is (2, -2, 1)/3. If points A and B are ten units apart, find the coordinates of point B. 10M

UNIT - II

4. a) State and explain Coulomb's law indicating clearly the units of quantities in the equation of force? 5M
   b) State and prove Gauss's law and write limitations of Gauss's law? 5M

OR

5. Find an expression for electrical field intensity due to infinite line charge? 10M

UNIT - III

6. Explain the phenomenon of polarization when a dielectric slab is subjected to an electric field? 10M

OR

7. At the boundary between glass εr=4 and air, the lines of electric field make an angle of 400 with normal to the boundary. If electric flux density in the air is 0.25μC/m3 . Determine the orientation and magnitude of electric flux density in the glass? 10M

UNIT - IV

8. (a) Derive the expression for torque produced on a closed current carrying when placed in a magnetic field? 10M

OR

9. a) Derive the expression for self-inductance of solenoid and toroid? 5M
   b) Derive the expression for inductance of a co-axial cable? 5M

UNIT - V

10. Write Maxwell's equation in good conductors for time varying fields and static fields both in differential and integral form? 10M

OR

11. Derive expressions for integral and point forms of poynting Theorem? 10M

Code: 18CE0103 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Supplementary Examinations August 2021
INTRODUCTION TO SOLID MECHANIS
(CIVIL)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) What is thermal Stress? 2M
   (b) Mention the types of supports. 2M
   (c) What are the assumptions made in torsion equation? 2M
   (d) Define: Mohr's Theorem for slope and deflection. 2M
   (e) Define Slenderness Ratio and Buckling. 2M

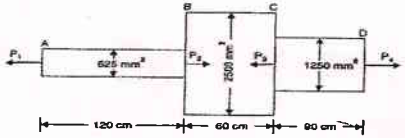
PART- B
(Answer all five units, 5 x 10 =50 Marks)

UNIT - I

2. A steel bar 50 mm wide, 12 mm thick and 300 mm long is subjected to an axial pull of 84 kN. Find the changes in the length, width, thickness and the volume of the bar. 10M

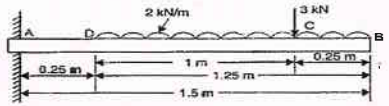
OR

3. A member ABCD is subjected to point loads P1, P2, P3 and P4 as shown in figure. Calculate the force P2 necessary for equilibrium, if P1=45 kN, P3 =450 kN and P4=130kN. Determine the total elongation of the member, assuming the modulus of elasticity to be 2.1 x 10^5 N/ mm2 10M



UNIT - II

4. Draw the shear force and bending moment diagram for the cantilever beam shown in figure 10M



OR

5. A cast Iron beam is of T- section has the following dimensions Flange: 100 mm x 20 mm Web: 80 mm x 20 mm. The beam is simply supported on a span of 8 meters and carries a uniformly distributed load of 1.5 KN/m length of entire span. Determine the maximum tensile and compressive stresses. 10M

UNIT - III

6. A rectangular beam 100 mm wide and 250 mm deep is subjected to a maximum shear force of 50 KN. Determine i) Average shear stress ii) Maximum shear stress iii) Shear stress at a distance of 25 mm above neutral axis. 10M

OR

7. Derive the relation for a circular shaft when subjected to torsion $\frac{T}{J} = \frac{\tau}{R} = \frac{C\theta}{L}$ 10M

UNIT - IV

8. Prove that the relation that $M=EI\frac{d^2y}{dx^2}$ 10M

OR

9. A simply supported beam carries a UDL of 20 kN/m over its span of 8 m. Determine the slope at the ends and the deflection at mid span by moment area method if E = 200 G N/m^2 and I= 30,000cm^4. 10M

UNIT - V

10. Compare the Euler crippling loads of two columns-one of solid circular section and the second of hollow circular section of internal diameter 70% of the external diameter if they are of the same material, same length, same area, and same end conditions. 10M

OR

11. Derive an Euler's load expression for the column with one end fixed and the other end hinged. 10M

Code: 18CE0151 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester (R18) Supplementary Examinations Aug-2021
STRENGTH OF MATERIALS
(Mechanical Engineering)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) Define Poisson's ratio 2M
   (b) Define point of contra flexure? In which beam it occurs? 2M
   (c) Write the theory of simple bending equation 2M
   (d) Define torsional rigidity of the solid circular shaft 2M
   (e) What is meant by Circumferential stress 2M

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

UNIT - I

2. (a) Explain clearly the different types of stress and strains. 5M
   (b) A steel bar of rectangular cross section of 25 mm X 40 mm carries an axial load of 40 kN. Determine the average tensile stress over a normal coss section of bar. 5M

OR

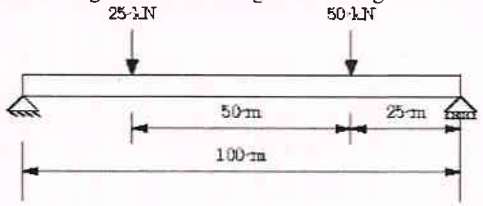
3. Define Strain energy & resilience. A tensile load of 70 KN is gradually applied to a circular bar of 4 cm diameter and 5 m long if E=2x105 N/mm2. Determine: i) stretch in the rod (ii) stress in the rod and (iii) strain energy absorbed by the rod. 10M

UNIT - II

4. a) What are the different types of beams? Explain 5M
   b) A cantilever of length 3 m carries a uniformly distributed load of 3.5 KN/m length over the whole length and a point of 4.5 KN at the free end. Draw SFD and BMD for the cantilever. 5M

OR

5. a) Explain briefly the relationship between shear force and bending moment at section 5M
   Draw the shearing force and bending moment diagrams for the beam shown in figure. 5M



UNIT - III

6. Derive the bending equation. 10M

OR

7. A steel beam of I –section, 220 mm deep and 180 mm wide has 18 mm thick flanges and 12 m thick web. The beam is subjected to a shear force of 250 KN. Determine the shear stress distribution over the beam section. 10M

UNIT - IV

8. (a) Distinguish between the slope and deflection. Explain with one example. 5M
   (b) A cantilever beam of length 3m is carrying point load of 25 KN at free end. If the moment of inertia of beam = 10 mm^4 and the modulus of elasticity E=2.1x10 N/mm^2, find the slope and deflection at the free end using the double integration method. 5M

OR

9. Derive an expression for Torque transmitted by a hollow circular shaft. 10M

UNIT - V

10. (a) Discuss and name the stresses set up in thin cylinder subjected to an internal pressure 5M
    (b) A thin cylinder of internal diameter 1250mm contain a fluid at an internal pressure of 2 N/mm2.Determine the maximum thickness of the cylinder if the circumferential stress is not exceed 45 n/mm2, and longitudinal stress is not to exceed 30 N/mm2 . 5M

OR

11. A steel tube of 200 mm external diameter is to be shrunk on to another steel tube of 60 mm internal diameter. After shrinking the diameter at the junction is 120 mm. Before shrinking on the difference of diameter at the junction is 0.08 mm. Find the hoop stresses developed in the two tubes after shrinking on and the radial pressure at the junction. Take E= 2x 10^5 N/mm^2. 10M

Code: 18CS0505 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations August 2021

COMPUTER ORGANIZATION AND ARCHITECTURE

(CSE)

Time: 3 hours Max.Marks: 60

PART-A

(Compulsory Questions)

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

	(a)	What is meant by control unit?	2M
	(b)	What is floating point representation?	2M
	(c)	Draw the three-state bus buffer.	2M
	(d)	Define is cache memory?	2M
	(e)	What is meant by Pipelining technique?	2M

PART- B

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

UNIT - I

2.		Write in detail about Addressing Modes and its types?	10M
		OR	
3.		Explain about Instruction set architecture of a CPU with neat diagram?	10M

UNIT – II

4.		Explain the logic behind carry look-ahead adder with its circuit diagram?	10M
		OR	
5.		Explain in detail about Floating point numbers, its operations and implementing it.	10M

UNIT - III

6.		Explain about the applications of Logic Micro Operations?	10M
		OR	
7.	a)	Write about Bus transfer with neat diagram.	5M
	b)	Write out Register Representations and way it is used.	5M

UNIT - IV

8.		Explain about Cache Memory mapping functions with Page Replacement Algorithms.	10M
		OR	
9.	a)	List out some differences between RAM & ROM?	5M
	b)	List out some differences between SRAM & DRAM?	5M

UNIT - V

10.		Define hazards? Explain in detail about instruction hazards?	10M
		OR	
11.	a)	List out the conflicts in pipelining and explain about it	5M
	b)	Explain about 4-segment Instruction Pipeline with neat diagram	5M

Code: 18EC0403 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary Examinations Aug- 2021

SIGNALS &SYSTEMS

(ECE)

Time: 3 hours Max.Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) What are the basic operations on signals? 2M
   (b) State the Sampling theorem? 2M
   (c) Define transfer function of a system 2M
   (d) What is correlation? 2M
   (e) State initial value theorem of LT? 2M

PART- B

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

UNIT - I

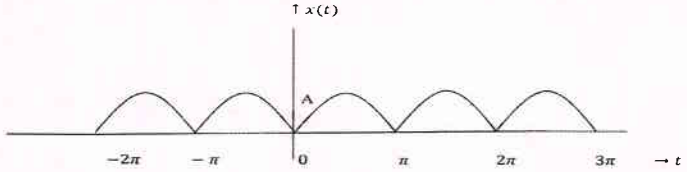
2. Examine whether the system is static or dynamic. 10M
   a) $y(t) = x(t-3)$
   b) $y(t) = d^2x(t)/dt + 2x(t)$
   c) $y(n) = x(n-2) + x(n)$
   d) $y(t) = 2x^3(t)$
   e) $y(n) = x(n) + x(n+2)$

OR

3. Define various elementary signals of CT and DT signals. Indicate them graphically. 10M

UNIT - II

4. Obtain the exponential Fourier series for the periodic signal $x(t)$ shown in below 10M



OR

5. (a) Derive the Continuous Fourier transform of a non-periodic signal from Continuous Fourier series of periodic signal 5M
   (b) State the merits and limitation of Fourier transform 5M

UNIT - III

6. Explain the transfer function of LTI systems and explain the filter characteristics of linear system. 10M

OR

7. (a) Explain the impulse sampling techniques in detail 5M
   (b) Explain the Data reconstruction and ideal reconstruction filter in detail. 5M

UNIT - IV

8. Verify Parseval's theorem for the energy signal $x(t) = e^{-t}u(t)$ 10M

OR

9. Explain the detection of periodic signal in the presence of noise by correlation. 10M

UNIT - V

10. List the comparison of Laplace transform and Fourier transform. 10M

OR

11. (a) What is meant by ROC? List the properties of ROC in Z transform. 5M
    (b) List the Advantages and limitation of Z transform. 5M

Code: 18EE0204 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations Aug- 2021

ELECTRIAL MACHINES-I

(EEE)

Time: 3 hours Max.Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) What is the purpose of yoke? 2M
   (b) Which losses are called variable losses? 2M
   (c) Define efficiency 2M
   (d) Why is the rating of the transformer expressed in KVA? 2M
   (e) State any 4 use of single phase induction 2M

PART- B

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

UNIT - I

2. Explain the basic principle of operation of a DC Generator with a simple loop generator? 10M

OR

3. Enumerate all the parts of a DC machine and indicate their function? 10M

UNIT – II

4. Explain the principle of operation of a D.C motor . Derive the equation for the torque Developed by a D.C. motor. 10M

OR

5. Explain the armature voltage and field flux control methods for the Speed control of a DC Motor. 10M

UNIT – III

6. Explain in detail about the parallel operation of DC shunt generators 10M

OR

7. Explain in detail about the parallel operation of DC series generators 10M

UNIT – IV

8. Discuss the constructional features of transformers. Draw neat diagram. 10M

OR

9. a) Explain the effect of variations of frequency and supply voltage on iron losses. 4M
   b) A 10KVA, 2200/400V transformer has R_1=5 Ω, X_1=12 Ω, R_2=0.2 Ω and X_2=0.48 Ω. Determine The equivalent impedance of the transformer referred to (i) primary side (ii) secondary side. 6M

UNIT - V

10. Discuss how you will perform O.C and S.C tests on a single phase transformer in the Laboratory. 10M

OR

11. Explain the construction and operation of Universal Motor. List out its merits and demerits. 10M

Code: 18CS0506

R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester (R18) Supplementary Examinations Aug- 2021
DATA BASE MANAGEMENT SYSTEMS
(CSE)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) Define Entity, Attributes, Entity set, relationship with appropriate notations 2M
   (b) Differentiate trigger with assertions. 2M
   (c) What is meant by attribute closure? 2M
   (d) What are the storage types? 2M
   (e) Design example for Clustered indexes? 2M

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

UNIT – I

2. Explain about integrity constraints over relations? 10M

OR

3. (a) Draw the Architecture of Database? 5M
   (b) Discuss about Database users and Administrators? 5M

UNIT – II

4. List out Aggregate Operators and explain with examples. 10M

OR

5. What is a join operator? Explain about conditional join and natural join with syntax and example. 10M

UNIT – III

6. Define normalization. List and Explain different normal forms with examples. 10M

OR

7. (a) Discuss multi-valued dependencies with fourth normal form with an example. 5M
   (b) Explain join dependencies with fifth normal form with an example. 5M

UNIT – IV

8. Discuss buffer management in concurrency control system 10M

OR

9. Explain transaction states with example. 10M

UNIT – V

10. (a) Illustrate Tree indexes? 5M
    (b) Explain about ISAM 5M

OR

11. Discuss Delete and Duplicated in Tree Structured Indexing 10M

Code: 18EE0242 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester (R18) Supplementary Examinations Aug-2021
NETWORK THEORY
(ECE)

Time: 3 hours Max.Marks: 60

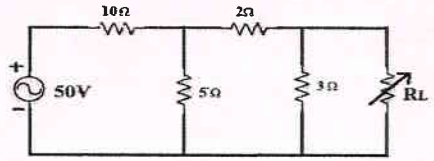
PART-A
(Compulsory Questions)

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

(a) Define Duality & Dual networks. 2M
(b) Define Neper and Decibel. 2M
(c) What is the behavior of Inductor in Initial and Steady state conditions? 2M
(d) Write the equations for Z-parameters in terms of Y-parameters. 2M
(e) Write any two properties of Fourier transforms 2M

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

2. (a) State and prove Reciprocity theorem 5M
(b) Determine the maximum power delivered to the load in the circuit shown in below figure. 5M



OR

3. (a) Explain about Nodal analysis and write the steps for applying nodal analysis. 5M
(b) Explain about Mesh analysis and write the steps for writing mesh analysis. 5M

UNIT - II

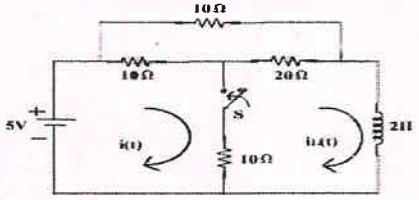
4. Explain about Constant-K low-pass filter in detail 10M

OR

5. Explain about Constant-K high-pass filter in detail 10M

UNIT - III

6. (a) Derive the Transient Response of series RC-circuit with D.C excitation 5M
(b) The circuit shown in below figure, the switch „S" is open and the circuit reaches a steady state. At t=0, the „S" is closed. Find the current in the inductor for t>0. 5M

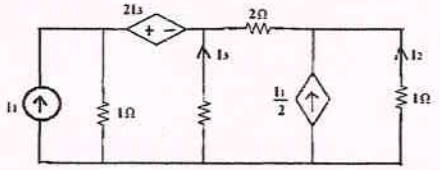


OR

7. Derive the Transient Response of Series RLC circuit with Sinusoidal excitation 10M

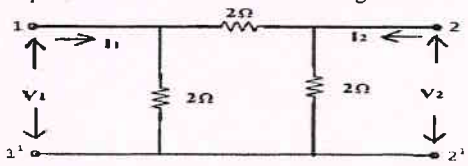
UNIT - IV

8. (a) The Z-parameters of a two-port network are Z11= 10Ω, Z22= 15Ω Z12= 5Ω and Z21= 5Ω . Find the equivalent T-network and ABCD parameters. 5M
(b) Find the current transfer ratio I_2/I_1 for the network shown on figure. 5M



OR

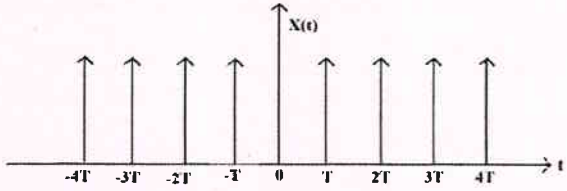
9. (a) Find the transmission parameters for the circuit shown in figure. 5M



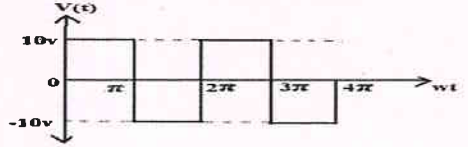
(b) The given Y-parameters are, Y11= 0.5, Y12= Y21= 0.6, Y22= 0.9.Find Impedance parameters. 5M

UNIT - V

10. (a) Find the Fourier Transform of a periodic unit impulse train shown in figure. 5M



(b) Obtain the Fourier series for the following waveform shown in figure. 5M



OR

11. Write and prove the properties of Fourier transforms. 10M

Code: 18EC0412 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations Aug- 2021
ELECTROMAGNETIC THEORY AND TRANSMISSION LINES
(ECE)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) Define Gauss Law 2M
   (b) State magnetic vector potential 2M
   (c) Define Transformer EMF. 2M
   (d) Define Polarization. 2M
   (e) List different types of transmission lines 2M

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

UNIT - I

2. Define Coulombs law. With reference to Coulombs law, Find 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. 10M

OR

3. (a) A Point Charge of 100 pC is located at (4,1, -3) while the x-axis carries a charge of 2nC/m. If the Plane z = 3 is also carries charge 5nC/m², find electric field $\boldsymbol{E}$ at (1,1,1). 5M
   (b) Enumerate the Relationship between electric field and E and Electric Potential V with suitable equations. 5M

UNIT - II

4. Find magnetic field $\boldsymbol{H}$ for a straight current carrying conductor using Biot Savart's law and Ampere's Circuit law. 10M

OR

5. (a) Justify your answer on the statement "Non-Existence of Magnetic Mono pole." 5M
   (b) Summarize and Express Maxwell's equation for static EM filed in differential and integral forms 5M

UNIT - III

6. (a) Explain Faraday's law of electromagnetic induction and derive the Expression for Induced EMF. 5M
   (b) Elaborate the importance of Displacement Current Density with suitable equations 5M

OR

7. Explain Motional and Transformer EMF with reference to time varying B fields 10M

UNIT - IV

8. Derive and obtain the relation between reflection coefficient and transmission coefficient due to reflection of plane waves at oblique incidence when E and H fields are polarized in parallel? 10M

OR

9. (a) Evaluate the expressions for attenuation constant and phase shift constant of lossy dielectric medium. 5M
   (b) Determine the expression for intrinsic impendence and propagation constant in a good conductor. 5M

UNIT - V

10. (a) Explain the applications of transmission lines. 5M
    (b) Evaluate the equation for Input Impedance of the Transmission line. 5M

OR

11. (a) Evaluate the equation for voltage and current at any point in a transmission line. 5M
    (b) A distortion less line has Z_0=60 Ω Attenuation constant = 20 mNp/m and u =0.6C (c is velocity of light) Find the primary parameters of the transmission line(R L C G and λ) at 100MHz. 5M

Code: 18EE0211 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021
CONTROL SYSTEMS
(EEE & ECE)

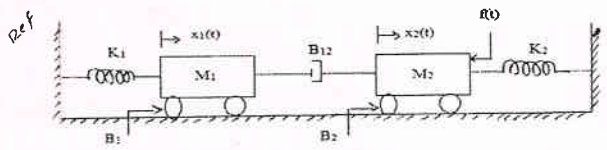
Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) What is block diagram? What are the basic components of block diagram? 2M
   (b) Define peak overshoot 2M
   (c) Explain BIBO stability 2M
   (d) Write the expression for resonant peak and resonant frequency 2M
   (e) Define state variable 2M

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

2. For the mechanical system shown in Figure, determine the transfer functions $\frac{X1(s)}{F(s)}$ & $\frac{X2(s)}{F(s)}$ 10M



OR

3. (a) Give the block diagram reduction rules to find the transfer function of the system 6M
   (b) List the properties of signal flow graph. 4M

UNIT - II

4. For servo mechanisms with open loop transfer function given below what type of input signal give rise to a constant steady state error and calculate their values. 10M

$G(s)H(s)=\frac{10}{s^2(s+1)(s+2)}$.

OR

5. Find all the time domain specifications for a unity feedback control system whose open loop transfer function is given by $G(S) = \frac{25}{S(S+5)}$. 10M

UNIT - III

6. Sketch the root locus of the system whose open loop transfer function is 10M

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

OR

7. Sketch the root locus of the system whose open loop transfer function is 10M

$G(s)\,H(s) = \frac{K(S^2+6S+25)}{S(S+1)(S+2)}$

UNIT - IV

8. Sketch the Bode plot for the following transfer function $G(s)H(s) = \frac{Ke^{-0.1s}}{S(S+1)(1+0.1S}$ 10M

OR

9. (a) Define and derive the expression for resonant frequency. 5M
   (b) Draw the magnitude bode plot for the system having the following transfer function: $G(s)\,H(s) = \frac{2000(S+1)}{S(S+10)(S+40}$ 5M

UNIT - V

10. (a) Find state variable representation of an armature controlled D.C Motor. 5M
    (b) A state model of a system is given as: 5M

$$\dot{X} = \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & -11 & -6 \end{pmatrix} X + \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} U \text{ and } Y = (1 \quad 0 \quad 0)X$$

Determine: (i) The Eigen Values. (ii) The State Transition Matrix.

OR

11. For the state equation: $\dot{X} = \begin{pmatrix} 0 & 1 \\ -2 & -3 \end{pmatrix} X + \begin{pmatrix} 0 \\ 1 \end{pmatrix} U$ with the unit step input and the initial conditions are $X(0) = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$. Solve the following (a) State transition matrix (b) Solution of the state equation. 10M

Code: 18CS0515 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021
COMPUTER NETWORKS
(CSE)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

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

	(a)	Name the functions of network layer	2M
	(b)	State the process of flow control	2M
	(c)	List the Network layer design issues.	2M
	(d)	Mention any three differences between TCP & UDP	2M
	(e)	State the purpose of SNMP.	2M

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

UNIT - I

2.		Explain in detail about Fiber optic cable	10M
		OR	
3.		Compare OSI and TCP/IP Network models	10M

UNIT - II

4.	(a)	Discuss about GO BACK N Protocol	5M
	(b)	How Selective repeat Protocol Works.	5M
		OR	
5.		Discuss about Various ALOHA protocols	10M

UNIT - III

6.	(a)	Explain distance vector routing algorithm.	5M
	(b)	Briefly state what is count to infinity problem?	5M
		OR	
7.		Compare Virtual circuit network and Datagram network with diagrams.	10M

UNIT - IV

8.		Correlate the various timers used by TCP to perform its various operations	10M
		OR	
9.	(a)	List the transport service primitives.	5M
	(b)	Explain about the elements of transport layer.	5M

UNIT - V

10.	(a)	Write about static web pages.	5M
	(b)	Explain about dynamic web pages.	5M
		OR	
11.		Illustrate File Transfer Protocol with neat diagram.	10M

Code: 18ME0312 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021
CAD/CAM
(MECH)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) What is Translation? 2M
   (b) What is the main drawback of wire frame modeling? 2M
   (c) List out any four advantage of using NC? 2M
   (d) Define Group Technology (GT). 2M
   (e) Explain the function of shop floor control 2M

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

UNIT - I

2. Discuss clearly the functions of a graphics package. 10M

OR

3. (a) Explain briefly about the Component of CAD system. 5M
   (b) Describe the Utilization in an Industrial Environment of CAD 5M

UNIT - II

4. Explain detail solid modeling and their representation. 10M

OR

5. Discuss various types of geometric modeling with neat sketches. 10M

UNIT - III

6. (a) Differentiate Manual part programming and Computer assisted part programming 5M
   (b) What are the advantages and disadvantages of Numerical control? 5M

OR

7. (a) Explain detail about cutter radius compensation 5M
   (b) Explain detail about motion statement. 5M

UNIT - IV

8. Explain the integration of CAQC with CAD/CAM 10M

OR

9. (a) Explain detail about Machine cell design 5M
   (b) Explain briefly optical non-contact inspection methods 5M

UNIT - V

10. (a) Explain the Generative CAPP type system with neat sketch. 5M
    (b) Write Short notes on MRP-II and advantage and dis advantage 5M

OR

11. Explain Capacity planning and MRP-I. 10M

Code: 18CS0516 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021
DESIGN AND ANALYSIS OF ALGORITHM
(CSE)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) Write the For LOOP general format. 2M
   (b) Give the recurrence relation of divide-and-conquer. 2M
   (c) Define optimal solution. 2M
   (d) State Sum of Subsets problem. 2M
   (e) What is a decision problem? 2M

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

2. (a) What is asymptotic notation? Explain different types of notations with examples? 5M
   (b) Illustrate an algorithm for (i) Finding factorial of n number (ii) Sum of n natural numbers 5M

OR

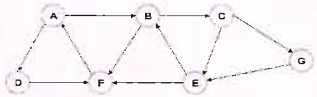
3. (a) Determine in steps of Union and Find algorithms with example. 5M
   (b) Explain space complexity in detail. 5M

UNIT - II

4. Analyze the working strategy of merge sort and illustrate the process of merge sort algorithm for the given data: 43, 32, 22, 78, 63, 57, 91 and 13. 10M

OR

5. Elaborate BFS algorithm and trace out minimum path for BFS for the following example. 10M



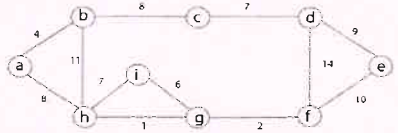
UNIT - III

6. Elaborate job sequencing with deadlines by using greedy method where given the jobs, their deadlines and associated profits as shown below. Calculate maximum earned profit. 10M

Jobs	J1	J2	J3	J4	J5	J6
Deadlines	5	3	3	2	4	2
Profits	200	180	190	300	120	100

OR

7. Apply the minimum spanning tree of the following graph using Kruskals algorithm and prims algorithm . 10M



UNIT - IV

8. Discuss the Hamiltonian cycle algorithm with step by step operation with example. 10M

OR

9. Simplify 0/1 knapsack problem and design an algorithm of LC Branch and Bound and find the solution for the knapsack instance of n = 4,(p1, p2, p3, p4) = (10, 10, 12, 18), (w1,w2, w 3, w4) = (2, 4, 6, 9) and M = 15. 10M

UNIT - V

10. Explain the class of P and NP with example? 10M

OR

11. State and explain cook's theorem? 10M

Code:18CE0116 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021
GEOTECHNICAL ENGINEERING
(CIVIL ENGINEERING)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. **Answer the following: (5 X 2 = 10 Marks)**
   (a) What is the critical gradient of a sand deposit of specific gravity 2.65 and void ratio 0.5? 2M
   (b) Define the terms 2M
   (i) Compression index (ii) Expansion index (iii Recompression index.
   (c) List out various assumptions of Boussinesq's equation. 2M
   (d) Explain compound failure with neat sketch. 2M
   (e) Write short notes on soil exploration. 2M

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

2. (a) Explain quick sand condition. 5M
   (b) The moist unit weight of soil sample is 19.2 kN/m3 and has water content of 9.8%. The specific gravity of soil particles is 2.69. Determine dry unit weight, void ratio and porosity and degree of saturation. 5M

OR

3. Determine the average coefficient of permeability in the horizontal and vertical direction for a deposit consisting of three layers of thickness 5m, 1m, and 2.5m and having the coefficient of permeability of 3 $x10^{-2}$ mm/sec, $3x10^{-5}$ mm/sec and 4 $x10^{-2}$ mm/sec respectively. 10M

UNIT - II

4. (a) Explain various factors effecting the compaction 5M
   (b) The maximum dry density of a sample by the light compaction test is 1.78g/cc at an optimum water content of 15%. Find the air voids and degree of saturation G=2.67. What would be the corresponding value of dry density on the zero air voids at optimum moisture content? 5M

OR

5. (a) Define preconsolidation pressure. 5M
   (b) Draw the graph representing preconsolidation pressure. 5M

UNIT - III

6. (a) What do you understand by 'Pressure bulb'? Illustrate with neat sketch. 5M
   (b) A concentrated load of 2000 kN acts vertically at the ground surface. Determine the vertical stress at a point P which is 6m directly below the load. Also calculate the vertical stress at a point R which is at a depth of 6m but at a horizontal distance of 5m from the axis of the load. 5M

OR

7. Explain the principle of the direct shear test. Enlist the advantages and its limitations. 10M

UNIT - IV

8. With the help of a neat sketch show various forces considered for the analysis of a finite slope using Bishop's simplified method. Mention the equation for factor of safety given by this method. 10M

OR

9. (a) Explain Taylor's stability number. 5M
   (b) A vertical cut is made is made in a clay deposit (c=30 kN/m^2, $\Phi' = 0^o$, γ=16 kN/m^3). Find the maximum height which can be temporarily supported. Take S_n=0.261. 5M

UNIT - V

10. (a) Describe the construct of a split spoon sampler. Explain how undisturbed soil sample is extracted using it. 5M
    (b) A SPT was conducted in fine sand below the water table and a value of 25 is obtained for N. What is the corrected value of N. 5M

OR

11. Explain in detail how plate load Test is conducted with neat sketch. 10M

Code: 18EC0413 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION
(ECE)

Time: 3 hours Max. Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) List the Performance Characteristics of an Instrument 2M
   (b) Define Deflection Sensitivity. 2M
   (c) What do you mean by heterodyne principle? 2M
   (d) What are the different connections used in Q meter? 2M
   (e) What is secondary transducer? 2M

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

2. (a) Explain the construction of multi-range voltmeter & Range extension DC voltmeter. 5M
   (b) A D'Arsonval movement with a full-scale deflection current of 50 μA and internal resistance of 500Ω is to be converted into a multirange voltmeter. Define the value of multiplier required For 0-20V, 0-50V, 0-100V. 5M

OR

3. (a) Explain different types of errors that occur in measurements. 5M
   (b) Explain about Differential type voltmeter. 5M

UNIT - II

4. Draw the block diagram of a general-purpose oscilloscope (CRO) and explain function of each block. 10M

OR

5. (a) Explain the major parts of CRT with a block diagram. 5M
   (b) Explain Two electron beam(dual beam) CRO. 5M

UNIT - III

6. Explain the working of a standard sweep generator with diagram. What is sweep generator? Explain in detail. 10M

OR

7. Discuss in detail about pulse generator .Explain the method of generate random noise. 10M

UNIT - IV

8. Explain the operation of Kelvin Bridge and derive necessary equation. 10M

OR

9. What is the function of bridge? Draw the Anderson's bridge circuit and derive necessary Equations& explain it. 10M

UNIT - V

10. (a) What are the differences between the active & passive transducers? 5M
    (b) Explain the operation of potentiometric transducer. 5M

OR

11. With a neat sketch explain the operation of LVDT. What are the advantages & disadvantages? 10M

Code: 18ME0313 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021

DESIGN OF MACHINE ELEMENTS-I

(ME)

Time: 3 hours Max.Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   - (a) Distinguish between brittle fracture and ductile fracture. 2M
   - (b) Explain notch sensitivity. 2M
   - (c) What is bolt of uniform strength? 2M
   - (d) What are the main functions of the knuckle joints? 2M
   - (e) What is the main use of woodruff keys? 2M

PART- B

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

UNIT - I

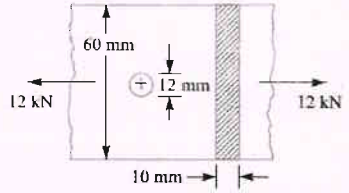
2. (a) What are the general design consideration should be followed while designing a machine element? 5M
   (b) Classify the manufacturing consideration that is followed while designing a machine element. 5M

OR

3. The load on a bolt consists of an axial pull of 10 kN together with a transverse shear force of 5 kN. Find the diameter of bolt required according to 1. Maximum principal stress theory; 2. Maximum shear stress theory; 3. Maximum principal strain theory; 4. Maximum strain energy theory; and 5. Maximum distortion energy theory. 10 M

UNIT - II

4. (a) Find the maximum stress induced in the following cases taking stress concentration into account: A rectangular plate 60 mm × 10 mm with a hole 12 diameter as shown in Fig. and subjected to a tensile load of 12 kN. 5M



   (b) What is the notch sensitivity? And write the expression for it. 5M

OR

5. A circular bar of 500 mm length is supported freely at its two ends. It is acted upon by a central concentrated cyclic load having a minimum value of 20 kN and a maximum value of 50 kN. Determine the diameter of bar by taking a factor of safety of 1.5, size effect of 0.85, surface finish factor of 0.9. The material properties of bar are given by : ultimate strength of 650 MPa, yield strength of 500 MPa and endurance strength of 350 MPa. 10 M

UNIT - III

6. Derive the expression for eccentric load acting parallel to the axis of bolts. 10 M

OR

7. (a) What do you understand by the term riveted joint? Explain the necessity of such a joint? 5M
   (b) What do you understand by the term 'efficiency of a riveted joint'? 5M

UNIT - IV

8. Design a knuckle joint to transmit 150 kN. The design stresses may be taken as 75 MPa in tension, 60 MPa in shear and 150 MPa in compression. 10 M

OR

9. A shaft made of mild steel is required to transmit 100 kW at 300 r.p.m. The Supported length of the shaft is 3 meters. It carries two pulleys each weighing 1500 N supported at a distance of 1 meter from the ends respectively. Assuming the safe value of stress, determine the diameter of the shaft. 10 M

UNIT - V

10. How are the keys classified? Draw neat sketches of different types of keys and state their applications. 10 M

OR

11. Design and draw a cast iron flange coupling for a mild steel shaft transmitting 90 kW at 250 r.p.m. The allowable shear stress in the shaft is 40 MPa and the angle of twist is not to exceed 1° in a length of 20 diameters. The allowable shear stress in the coupling bolts is 30 MPa. 10 M

Code: 18CE0117 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021
HYDROLOGY AND WATER RESOURCES ENGINEERING
(CE)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) Write any 3 limitations of rational method. 2M
   (b) What is meant by specific retention? 2M
   (c) What is kor depth? 2M
   (d) Illustrate about safe yield. 2M
   (e) Write the combination of loading for design of gravity dam. 2M

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

2. The ordinates of a 6-h unit hydrograph are given a storm had 3 successive 6-h intervals of rainfall magnitude of 3,5 and 4 cm respectively. Assuming a Φ-index of 0.23 cm/ hr and a base flow of 30m3/s. Determine the resulting hydrograph 10M

Time In hour	0	6	12	18	24	30	36	42	48	54	60	66
Ordinate of 6-hr U.H(m^3/s)	0	250	600	800	700	600	450	320	200	100	50	0

OR

3. (a) Explain with the help of a diagram the hydrological cycle with components. 5M
   (b) With the help of a neat sketch explain the single tube infiltrometer. Distinguish the difference between Φ-index and W-index. 5M

UNIT - II

4. With a neat sketch explain Dupuit's theory for confined aquifer. An undisturbed rock sample has an over dry weight of 1305 gm. When it is completely saturated with kerosene it weighed 1436 gm. The saturated sample, when immersed in kerosene displaced 605gm of kerosene. What is the porosity of the sample? 10M

OR

5. (a) Briefly discuss in detail with flow chart about the types of irrigation. 10M
   (b) Define duty and delta of irrigation.

UNIT - III

6. (a) A water course commands an irrigation area 1000 hectares. The intensity of irrigation of rice in this area is 70%. The transplantation of rice crop takes 15 days and during the transplantation period the total depth of water required by crop on field is 500 mm. during transplantation period, the useful rainwater falling on field is 120 mm. Find during transplantation, at head of field and also at head of water course. Also calculate the discharge required in water course. 5M
   (b) Explain with neat sketch about the types of fall in dam irrigation. 5M

OR

7. (a) A field of 4 hectares has an average root zone depth of 1.0m, a field capacity of 18% (both by weight). Assume that it's desirable to irrigation when 60% of available moisture has been extracted. The field is irrigated by a sprinkler system which delivers 300 m^3/hour over a period of 12 hours. What is water application efficiency? Density of soil is 1400kg/m^3. 5M
   (b) Write the design step by step procedure for Sarada type falls with formulas. 5M

UNIT - IV

8. Explain the different types of zones of storages in the reservoir with the help of neat sketch. 10M

OR

9. (a) What is flood routing? and explain about method of flood routing by graphical method. 5M
   (b) Explain various types of reservoirs. 5M

UNIT - V

10. (a) A masonry dam 6 m high and 1.5 m wide at the top and 4.5 m wide at the bottom, with vertical face. Determine the normal stresses at the toe and heel for reservoir empty and reservoir full conditions. Take ρ=2.4 and c=1. 5M
    (b) Discuss the physical factors that govern selection of type of dam. 5M

OR

11. Explain with sketch about galleries in gravity dam. Write briefly on various forces that act on a gravity dam. 10M

Code: 18EC0414 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021
DIGITAL SIGNAL PROCESSING
(ECE & EEE)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) How to find the linear convolution from circular convolution? 2M
   (b) What are the advantages and disadvantages of bi linear transformation? 2M
   (c) Define Gibb's phenomenon. 2M
   (d) What are the errors generated by A/D process? 2M
   (e) Draw the block diagram of Von-Numann Architecture 2M

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

2. Compute 8-point DFT of the sequence x(n)= {1,2,3,4,4,4,3,2,1} using radix-2 DIF-FFT algorithm. 10M

OR

3. (a) State and prove the following properties of DFT 6M
   (i) Linearity (ii) Complex conjugate property (iii) Circular convolution (iv) Time reversal
   (b) Compare DFT and FFT algorithms. 4M

UNIT - II

4. Explain the steps to be followed to design an analog Butter worth filter. 10M

OR

5. (a) Describe impulse invariant method of designing IIR filter. 5M
   (b) Explain the different types of IIR filter realization with suitable example. 5M

UNIT - III

6. (a) Determine the coefficients of a linear phase FIR filter of length N=15 which has a symmetric unit sample response and a frequency response that satisfies the conditions. 7M
   $H(2\pi k/15) = 1$ for k=0,1,2,3
   $= 0$ for k=4, 5, 6, 7
   (b) Summarize the advantages and disadvantages of FIR Filters. 3M

OR

7. (a) Determine the Direct form realization of system function 5M
   $H(z) = 1 + 2z^{-1} - 3z^{-2} - 4z^{-3} + 5z^{-4}$
   (b) Construct the linear phase realization of the system function 5M

$$H(z) = \tfrac{1}{2} + \frac{1}{3}z^{-1} + z^{-2} + \tfrac{1}{4}z^{-3} + z^{-4} + \frac{1}{3}z^{-5} + \tfrac{1}{2}z^{-6}$$

UNIT - IV

8. The output signal of an A/D converter is passed through a first order low pass filter with transfer function $H(Z) = (1-a)\frac{z}{(z-a)}$ $for\ 0 < a < 1$. Determine the steady state output noise power due to quantization at the output of the digital filter. 10M

OR

9. (a) What is quantization of analog signals? Derive the expression for the quantization error. 5M
   (b) Explain in detail the effects of input quantization error. 5M

UNIT - V

10. (a) Distinguish between the dual-access RAM and single-access RAM used in the on-chip m 5M
    (b) Discuss the advantages and disadvantages of VLIW architecture. 5M

OR

11. With a neat sketch explain the architecture of TMS 320C50 processor. 10M

Code: 18CS0514 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021
COMPILER DESIGN
(CSE)

Time: 3 hours Max.Marks: 60

PART-A
(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) List the various phases of a compiler. 2M
   (b) Define Context Free Grammar. 2M
   (c) Define Type checking 2M
   (d) Write properties of memory management 2M
   (e) Define Dead-code elimination with example 2M

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

UNIT - I

2. Explain the phases of a compiler with neat diagram. 10M

OR

3. (a) Explain LEX Tool with a Lex Program. 5M
   (b) Write about input buffering. 5M

UNIT - II

4. Consider the grammar E->E+T/T, T->T*F/F, F->(E) | id Construct predictive parsing table and check given grammar is LL(1) or not? 10M

OR

5. Explain Error recovery in predictive parsing with an Example. 10M

UNIT - III

6. Define augmented grammar. Construct the LR(0) items for the following Grammar 10M
   S->L=R
   S->R
   L->*R
   L->id
   R->L

OR

7. (a) Write about SLR parsing 5M
   (b) Write about YACC tool 5M

UNIT - IV

8. Explain Representation of Three Address Codes with suitable Examples. 10M

OR

9. (a) Discuss about symbol table entries 5M
   (b) Write about operations on symbol table 5M

UNIT - V

10. (a) Construct the DAG for following statement. a+b*c+d+b*c 5M
    (b) Discuss function preserving transformations 5M

OR

11. Construct the DAG for the following basic blocks 10M
    1. t1:=4*i
    2. t2:=a[t1]
    3. t3:=4*i
    4. t4:=b[t3]
    5. t5:=t2*t4
    6. t6:=prod+t5
    7. prod:=t6
    8. t7:=i+1
    9. i:=t7
    10. if i<=20 goto 1

Code: 18ME0314 R18

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021

MACHINE TOOLS

(Mechanical Engineering)

Time: 3 hours Max.Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) Name different tool wear mechanisms occur in cutting tool during machining operation. 2M
   (b) What is meant by tool layout of a turret lathe? 2M
   (c) What are the different principal parts of a milling machine? 2M
   (d) List the different types of lathe. 2M
   (e) Indian standard marking system of a grinding wheel representation is "W A 46 K 5 V 17" here what is "V" represent? 2M

PART- B

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

UNIT - I

2. List the various types of chips produced during metal cutting process. Describe the condition in which these types of chips are produced. Why discontinuous chips are preferred over the continuous chip? 10M

OR

3. (a) Differentiate between the orthogonal and oblique cutting. 5M
   (b) What do you understand by cutting tool nomenclature? Sketch and label the tool angles. 5M

UNIT - II

4. Draw a Merchant's circle diagram and derive expressions to show relationships among the different forces acting on the cutting tool and coefficient of friction. 10M

OR

5. The following equation for tool life is given for a turning operation $VT^{0.13} f^{0.77} d^{0.37} = C$. A 60 minute tool life was obtained while cutting at cutting velocity =30 m/min, feed rate =0.3 mm/rev and depth of cut = 2.5 mm. Determine the change in tool life if the cutting speed, feed and depth of cut an increased by 20% individually and also taken together. 10M

UNIT - III

6. (a) List the various tool holding devices used in capstan/turret lathes. 5M
   (b) Explain the Apron feed mechanisms in the Engine lathe. 5M

OR

7. (a) Explain the Turret indexing mechanism in capstan lathe. 5M
   (b) Name the different types of lathe operations? Explain about facing and knurling operations with neat sketches. 5M

UNIT - IV

8. (a) What are the various feed mechanisms in a shaper? 5M
   (b) Describe the main parts of a slotting machine. Describe at least three of them. 5M

OR

9. (a) Explain briefly Up-milling process and Down milling process. 5M
   (b) Describe the Whitworth quick return mechanism used in shapers. 5M

UNIT - V

10. (a) Explain the principles of jig and fixture design. 5M
    (b) Outline the nature and characteristics of abrasives used in grinding wheels. 5M

OR

11. (a) What is honing? How and why it is performed? 5M
    (b) What is a grinding wheel? What are the grinding wheel parameters that influence the grinding performance? 5M

Code:18EC0415 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021

DIGITAL COMMUNICATIONS

(ECE)

Time: 3 hours Max.Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   (a) Define slope overload distortion? 2M
   (b) Give the Nyquist criterion for zero ISI? 2M
   (c) What is matched receiver? 2M
   (d) Compare the major difference between a QPSK & MSK signal? 2M
   (e) Write the of encoder of (7,4) Hamming code with suitable diagram? 2M

PART- B

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

UNIT - I

2. Discuss the Noise considerations in PCM systems? Explain the regenerative repeaters with a suitable diagram? 10M

OR

3. (a) An audio signal consisting of the sinusoidal term $x(t) = 3\cos(500\pi t)$. Find the signal to quantization noise ratio, when this is quantized using 10 bit PCM? 5M
   (b) Discuss the noise effects in Delta Modulation? 5M

UNIT - II

4. A polar NRZ waveform has to be received into the help of a matched filter. Here binary '1' and '0' are represented as a rectangular positive pulse and a rectangular negative pulse. Determine the impulse response of the matched filter. Also sketch it.? 10M

OR

5. What is correlative coding? Explain its types? 10M

UNIT - III

6. (a) Draw the signal constellation diagrams for N=M=2 5M
   (b) Write a brief note on signal constellation diagram? 5M

OR

7. Draw the block diagram of the structure and behavior of Matched filter Receive 10M

UNIT - IV

8. Draw the block diagram of QPSK transmitter and receiver and explain each block in detail? 10M

OR

9. (a) Describe the generation and detection of BPSK 5M
   (b) Derive an expression for probability of error in BFSK 5M

UNIT - V

10. (a) What is forward error correction system and explain in detail? 5M
   (b) The Generator matrix(G) for a (7, 4) block code is given below 5M

$$\begin{vmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{vmatrix}$$ Find the parity check matrix G

OR

11. Draw and explain the block diagram of ARQ system in detail? Write about various types of ARQ systems? 10M

Code: 18CS0517 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021

PYTHON PROGRAMMING

(CSE)

Time: 3 hours Max.Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   - (a) Explain any two string methods with examples. 2M
   - (b) Write short notes on Membership Operators with example. 2M
   - (c) Define Method Overloading and Method Overriding in python. 2M
   - (d) How do you handle exceptions with Try/Except/Finally in Python? 2M
   - (e) Write any five Turtle Graphics functions and their syntax. 2M

PART- B

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

UNIT - I

2. a) Explain about the Single-Valued data types in python 5M
   b) write a program for using Strings-indexing and slicing 5M

OR

3. a) What is Set? Explain set Operations 5M
   b) Explain the differences of dictionaries and tuples. 5M

UNIT - II

4. Explain the syntax and examples of the following statements 10M
   i) for loop ii) while loop iii) if-elif-else

OR

5. a) List various types of operators in Python with examples. 5M
   b) Write a function called cumsum that takes a list of numbers and returns the cumulativesum; that is, a new list where the ith element is the sum of the first i+1 elements from the original list. 5M

UNIT - III

6. Explain in detail about python function creation and usage with example. 10M

OR

7. a) What is inheritance? Illustrate types of inheritance with python code. 5M
   b) Describe about class constructor (_init_()) with example. 5M

UNIT - IV

8. Explain various python Exception with examples 10M

OR

9. a) What is module? How to create a module explain with an example. 5M
   b) Define PIP. Discuss package installation via pip. 5M

UNIT - V

10. a) Discuss about Maps and Filters in python 5M
    b) Write an appropriately general set of functions that can draw shapes using turtle graphics. 5M

OR

11. a) Write about Dates and Times. 5M
    b) Explain about the reading and writing files in python 5M

Code: 18ME0315 **R18**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021

Thermal Engineering

(Mechanical Engineering)

Time: 3 hours Max.Marks: 60

PART-A

(Compulsory Questions)

1. Answer the following; (5 X 2 = 10 Marks)
   - (a) Define Heat Engine and Differentiate I C Engine from E C Engine — 2M
   - (b) State how the air compressors are classified. — 2M
   - (c) Show the T-S Diagram for Simple Rankine cycle. — 2M
   - (d) Classify the various types of nozzles. — 2M
   - (e) What are the methods of steam turbine governing? — 2M

PART- B

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

UNIT - I

2. (a) Give explanation about the Working principle of 2-Stroke SI Engine — 5M
   (b) Show the theoretical and actual valve-timing diagram for Diesel engine. — 5M

OR

3. (a) Explain the working of 4-stroke Petrol engine — 5M
   (b) With a neat sketch explain any three parts in Internal Combustion engine — 5M

UNIT - II

4. (a) Explain the working principle of single stage single acting reciprocating air compressor — 5M
   (b) A single stage reciprocating compressor takes 1 m^3 of air per minute at 1.013 bar and 15 ^0C and delivers it at 7 bar. Assuming that the law of compression is $PV^{1.35}= C$ and the clearance is negligible, calculate the indicated power. — 5M

OR

5. A single –stage double –acting air compressor is required to deliver 14 m^3 of air per minute measured at 1.013 bar and 1500^0 C. The delivery pressure is 7 bar and the speed 300 rpm. Take the clearance volume as 5% of the swept volume with the compression and expansion index of 1.3 Calculate: — 10M
   (i) Swept volume of the cylinder (ii)The delivery temperature
   (iii) Indicated power

UNIT - III

6. (a) Explain with the help of neat diagram about Regenerative Cycle — 5M
   (b) In a steam power cycle, the steam supply is at 15 bar and dry and saturated. The condenser pressure is 0.4 bar. Calculate the Rankine efficiencies of the cycle. Neglect pump work. — 5M

OR

7. (a) Construct the expression for efficiency of Rankine cycle — 5M
   (b) Steam at a pressure of 15 bar and 250^0C is expanded through a turbine at first to a pressure of 4 bar. It is then reheated at constant pressure to the initial temperature of 250^0C and is finally expanded to 0.1 bar. Using mollier chart, estimate the work done per kg of steam and amount of heat supplied — 5M

UNIT - IV

8. Explain about Surface condenser and discuss its types with neat sketches. — 10M

OR

9. (a) Derive an expression for discharge through the nozzle and condition for maximum discharge. — 5M
   (b) Steam initially dry and saturated is expanded in a nozzle from 15 bar at 300 ^{0}C to 1.0 bar. If the frictional loss in the nozzle is 12% of the total heat drop calculate the mass of steam discharged when exit diameter of the nozzle is 15 mm — 5M

UNIT - V

10. (a) Show the velocity triangle diagram of reaction turbine — 5M
    (b) Stage of a steam turbine is supplied with steam at a pressure of 50 bar and 350°C, and exhausts at a pressure of 5 bar. The isentropic efficiency of the stage is 0.82 and the steam consumption is 2270 kg/min. Determine the power output of the stage — 5M

OR

11. Explain about the various methods of Governing steam turbines with neat sketches — 10M

Code: 18ME0307 R18/SS

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech III Year I Semester (R18) Supplementary Examinations Aug-2021

NON-CONVENTIONAL ENERGY SOURCES

(Mechanical Engineering)

Time: 3 hours Max. Marks: 60

PART-A

(Compulsory Questions)

1.		**Answer the following; (5 X 2 = 10 Marks)**	2M
	(a)	What are the types of solar radiation measuring Instruments?	2M
	(b)	Mention the thermal analysis of flat plate collector	2M
	(c)	What is wind power?	2M
	(d)	What is biomass gasifier?	2M
	(e)	What is the basic principle of ocean thermal energy conversion ?	2M

PART- B

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

UNIT - I

2.	(a)	What is conventional and non-conventional Energy? Write the merits and demerits of Conventional energy sources?	5M
	(b)	Name the renewable energy sources and explain them in brief	5M

OR

3.	(a)	Mention the merits and demerits of solar energy	5M
	(b)	What are energy resources available in India?	5M

UNIT - II

4.	(a)	Write the applications of solar energy	5M
	(b)	Explain the working principle of solar PV cells	5M

OR

5		Enumerate the different types of concentrating type collectors	10M

UNIT - III

6.		Describe with a neat sketch the working of wind energy system with main components	10M

OR

7.		What are the different types of vertical axis wind turbines? Write about Savonius and ducted wind turbines with neat sketches.	10M

UNIT - IV

8.	(a)	What is biomass and why it is called as renewable energy?	5M
	(b)	What are the different forms of bio-energy?	5M

OR

9.		Explain the working of biomass Cogeneration system with a neat sketch and also mention its applications	10M

UNIT - V

10.		Explain the working of fuel cell and their applications	10M

OR

11.		Explain in detail about the hybrid systems	10M