AR16

CODE: 16CE2004 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January-2019

SURVEYING

(Civil Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a What are the types of error in surveying 6M
   b A 30 m tape weighs 12g/m and has a cross sectional area of 0.020cm^2. It measures correctly when supported throughout under a tension of 85 N and at a temperature of 20^{0}C. When used in the field, the tape is only supported at its ends, under a tension of 85N. The temperature is 13.5^{0}C. What is the distance of zero and 30 mark under these conditions? 8M

(OR)

2. a Define Meridian. What are the different types of merdian? 6M
   b The following are the fore bearing and back bearings of the sides of a closed traverse. 8M

Line	FB	BB
AB	150^0 15’	330^0 15’
BC	20^0 30’	200^0 30’
CD	295^0 45’	115^0 45’
DE	218^0 00’	38^0 00’
EA	120^0 30’	300^0 30’

Calculate the interior angles of the traverse

UNIT-II

3. a Explain in brief about the temporary adjustments of the Level. 4M
   b The following consecutive readings were taken with a levelling instrument at intervals of 20m 10M
   2.375, 1.730, 0.615, 3.450, 2.835, 2.070, 1.835, 0.985, 0.435, 1.630, 2255 and 3.630m
   The instrument was shifted after the fourth and eighth readings. The last reading was taken on a BM of RL 110.200m find the RL’s of all points using HI Method

(OR)

4. The following successive readings were taken with a dumpy level along a chain line at common intervals of 20m. The first reading was taken on a chainage 140m. The RL of the second change point was 107.215m. The instrument was shifted after the third and seventh readings. Calculate the RL’s of all the points. 14M
   3.150, 2.245, 1.125, 3.860, 2.125, 0.760, 2.235, 0.470, 1.935, 3.225 and 3.890m

UNIT-III

5. Explain the procedure of determining the horizontal angle using Reiteration method with a neat sketch and represent the tabular form for noting the readings. 14M

(OR)

6. a Derive the equations for determining the constants of the tacheometer using stadia principle. 6M

b A tacheometer was set up at a station C and the following readings were obtained on a staff vertically held. 8M

Inst. at	Staff At	Vertical Angle	Hair Readings	Remarks
C	BM	- 5^0 20'	1.50, 1.80, 2.45	R.L of
C	D	+ 8^0 12'	0.75, 1.50, 2.25	BM=750.50m

Calculate the horizontal distance CD and RL of D, when the instrument constant are 100 and 0

UNIT-IV

7. Explain the types of traverse in surveying. 6M

Explain the Bowditch's Rule for closing error in traverse 8M

(OR)

8. A closed loop traverse was run among stations A, B, C and D having following observation 14M

Line	Length, m	W.C.B
AB	372.22	0^0 45'
BC	164.98	94^0 45'
CD	242.44	183^0 05'
DA	197.15	232^0 50'

Find the Consecutive Coordinates of the station

UNIT-V

9. a Sketch the diagram showing all the elements of a Compound curve and give their relationships 8M

b Two straight lines intersect at a chainage 1150.50 and the angle of intersection is 60^0, if the radius of the curve is 500m. determine 6M

a. tangent distance
b. length of the curve
c. length of long chord
d. degree of curve

(OR)

10. a Derive and explain to find the height of the object when the base of the object is inaccessible and instrument stations are in same plane. 7M

b Find the elevation of the top of a chimney with the data 7M

Inst. At	Reading on BM	Angle of elevation	Remarks
A	0.865 mtrs	$18^0 30^1$	R.L of BM=450.00m
B	1.225 mtrs	$10^0 15^1$	Distance AB=60m

AR16

CODE: 16EE2008 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January, 2019

ELECTRICAL CIRCUIT ANALYSIS

(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 70**

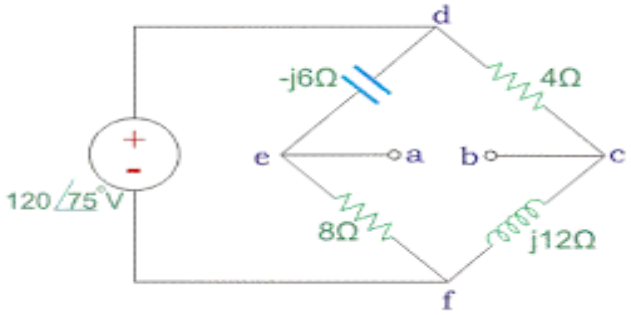
Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) State and explain the superposition theorem 7M
   b) Find the current through 30 ohms using superposition theorem. 7M

(OR)

2. a) Obtain the Norton's equivalent circuit for the network shown blow: 8M

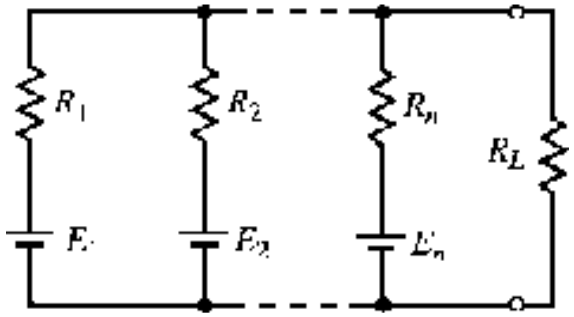


   b) State and prove reciprocity theorem choosing a suitable circuit. 6M

UNIT-II

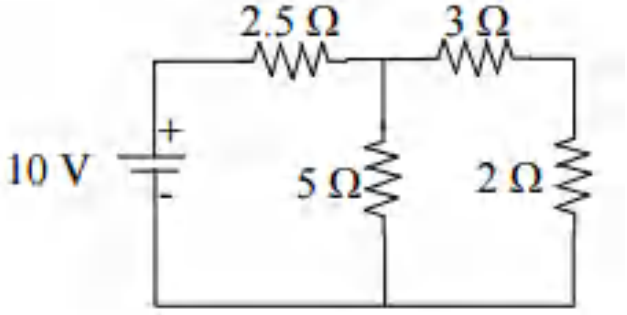
3. a) Derive the condition for maximum power transfer theorem 7M

   b) Using Millman;s theorem, find the current through R_L for the network shown below with R_1=10 ohms;R_2=12 ohms;R_3=R_n=15 ohms; E_1=25 V; E_2=35 V and E_3=E_n=45 V; R_L= 3 ohms. 7M



(OR)

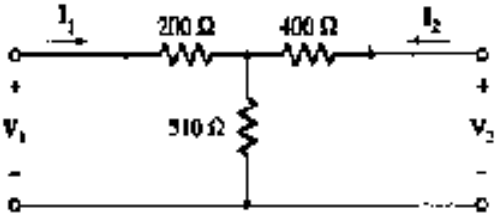
4. a) For the circuit given below, if the resistance of 5 ohms branch increases to 6 ohms in the circuit, Determine the compensation source. 7M



b) State and prove Tellegen's theorem with a suitable network. 7M

UNIT-III

5. a) Determine Y-parameters for the two port network given below. 7M

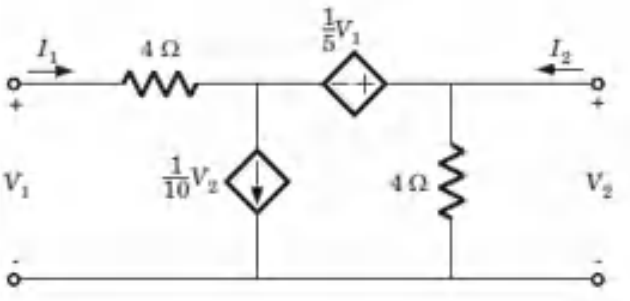


b) Determine Z-parameters for the two port network given below. 7M

(OR)

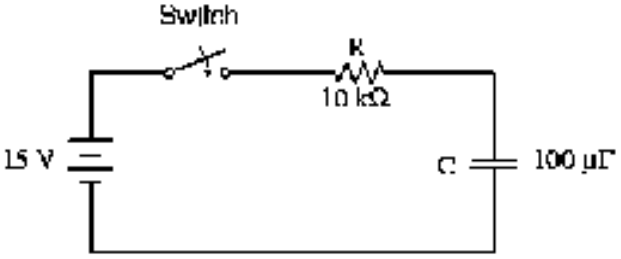
6. a) Determine the relationship between Z and h parameters. 7M

b) Determine Z-parameters for the two port network given below. 7M



UNIT-IV

7. Find the current and voltage of the capacitor at t = 5 milli sec. Also determine the voltage across R. Switch is closed at t=0. 14M



(OR)

8. Derive an expression for the current response in a RL series circuit excited by a constant voltage source V. Also draw its response curve. 14M

UNIT-V

9. a) Find Foster 2nd form for the impedance function given below: 7M

$$Z(s)=\frac{4(s^2+1)(s^2+9)}{s(s^2+4)}$$. Also draw the network.

b) Find Cauer 1st form for the impedance function given below: 7M

$$Z(s)=\frac{(s+1)(s+4)}{s(s+2)}$$. Also draw the networks.

(OR)

10. Realize the impedance function of Cauer 1st and Foster 1st forms. 14M

$$Z(s)=\frac{(s+2)(s+5)}{(s+1)(s+3)}$$. Also draw the resulting networks.

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Code No: 16ME2007 AR 16 SET-I

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech., I Semester Supplementary Examinations, January, 2019

THERMODYNAMICS

(Mechanical Engineering)

Time: 3 hours Max Marks: 70

Answer ONE question from each unit

All questions carry equal marks

All parts of the Questions must be answered at one place

UNIT-I

1. a) What are the different types of thermodynamic systems? Explain with examples.
   b) Discuss about thermodynamic equilibrium

(OR)

2. a) Show that work transfer is a path function and not a property.
   b) A gas undergoes a reversible non-flow process according to the relation $P = (-3V+15)$ where V is the volume in m^3 and P is the pressure in bar. Determine the work done when the volume changes from 3 m^3 to 6 m^3 .

UNIT-II

3. a) Derive the steady flow energy equation applied to compressor and nozzle.
   b)Air flows steadily at the rate of 0.5 kg/s through an air compressor, entering at 7 m/s velocity, 100kPa pressure, and 0.95 m3 /kg volume, and leaving at 5 m/s, 700 kPa, and 0.19 m3 /kg. The internal energy of the air leaving is 90 kJ/kg greater than that of the air entering. Cooling water in the compressor jacket absorbs heat from the air at the rate of 58 kW. (i) Compute the rate of shaft work input to the air in kW. (ii) Find the ratio of inlet pipe diameter to outlet pipe diameter.

(OR)

4. a) Establish the equivalence of Kelvin-Planck and Clausius statements.
   b) A domestic food freezer maintains a temperature of -15 °C. The ambient air temperature is 30 °C. If the heat leaks in to the freezer at the continuous rate of 1.75kJ/s what is the least power necessary to pump this heat out continuously?

UNIT-III

5. a) Explain the concepts of availability and irreversibility
   b)Air flows through an adiabatic compressor at 2 kg/s. The inlet conditions are 1 bar and 310 K and the exit conditions are 7 bar and 560 K. Determine the net rate of exergy transfer and the irreversibility. The ambient temperature can be taken as 298 K, the specific heat at constant pressure for air is 1.005 kJ/kgK and the gas constant for air is 0.287 kJ/kgK.

(OR)

6. a) Draw the phase equilibrium diagram for a pure substance on T-S plot with relevant constant property lines?
   b) A vessel of volume 0.04 m^3 contains a mixture of saturated water and saturated steam at a temperature of 250 °C. The mass of the liquid present is 9 kg. Find the pressure, mass, the specific volume , the enthalpy , the entropy and the internal energy.

UNIT-IV

7. a) Determine the pressure of nitrogen gas at T=175 K and v=0.00375 m^3 /kg on the basis of i) perfect gas equation ii) Vander Wall's equation. The Vander Wall's constants for nitrogen are , a=0.175 m^6.kPa / kg^2 and b=0.00138 m^3 /kg.

   b) A gas mixture consists of 7 kg nitrogen and 2 kg oxygen, at 4 bar and 27°C. Calculate the mole fraction, partial pressures, molar mass, gas constant, volume and density

(OR)

8 a) Atmospheric air at 1.0132 bar has a DBT of 30°C and WBT of 25°C.
Compute: i) the partial pressure of water vapour,
ii) specific humidity
iii) the dew point temperature
iv) the relative humidity

   b) State and prove Avogadro's law of additive volumes

UNIT-V

9. a) Stare the assumptions made in Air Standard Cycles and derive the expression for thermal efficiency in case of Diesel cycle.

   b) An engine working on Otto cycle has a volume of 0.5 m^3, pressure 1 bar and temperature 27°C at the commencement of compression stroke. At the end of compression stroke, the pressure is 10 bar. Heat added during the constant volume process is 200 kJ. Determine : (i)Percentage clearance (ii) Air standard efficiency (iii) Mean effective pressure. (iv) Ideal power developed by the engine if the engine runs at 400 r.p.m. so that there are 200 complete cycles per minutes.

(OR)

10. a) Represent the following cycles on P-V and T-S diagrams
i) Dual combustion cycle ii) Sterling cycle iii) Atkinson cycle and iv) Lenoir cycle

    b) An air-standard Diesel cycle has a compression ratio of 20, and the heat transferred to the working fluid per cycle is 1800 kJ/kg. At the beginning of the compression stroke, pressure is 1 bar and the temperature is 300 K. Calculate (i) Thermal efficiency, (ii) The mean effective pressure

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AR16

CODE: 16EC2006 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January, 2019

ELECTRONIC CIRCUITS – I

(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

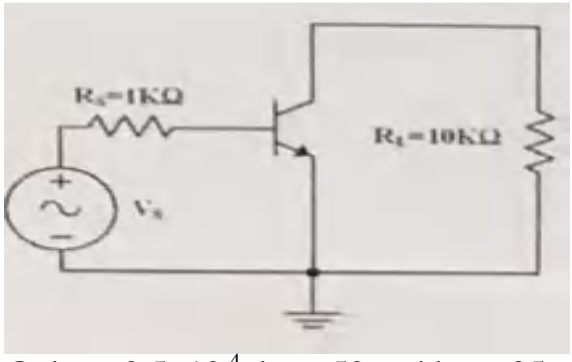
1.	a	With neat circuit diagram explain the operation of half-wave rectifier.	7M
	b	A 230V, 50 Hz voltage is applied to the primary of a 10:1 transformer used in bridge rectifier having a load resistance of 600Ω.Assuming the diodes are ideal, determine i) dc output voltage ii) dc power delivered to the load iii) PIV and iv) ripple frequency.	7M
		(OR)	
2.	a	With neat circuit diagram explain the operation of bridge rectifier.	7M
	b	Derive the expression for ripple factor of an LC filter with neat diagram	7M

UNIT-II

3.	a	Explain Thermal Runaway and thermal stability**.**	6M
	b	Draw voltage divider bias, explain and find stability factor "S" .	8M
		(OR)	
4.	a	Explain different types of bias compensations.	6M
	b	In a CE silicon transistor amplifier using self-bias circuit with parameters V_{CC}=12V, R_1=10k Ω, R_2=5k Ω, R_C =1k Ω, R_E =2k Ω and β=100, find the coordinates of the operating point and the stability factor.	8M

UNIT-III

5.	a	Plot h-model for CB, CE and CC configurations.	6M
	b	Compute A_I, R_I, A_V and R_O for the amplifier shown in figure	8M



h_{ie} = 1.1k Ω, h_{re} = 2.5×10^{-4}, h_{fe} = 50 and h_{oe} = 25μA/V.

(OR)

6. a How h-parameters are determined from the CE characteristics. 6M

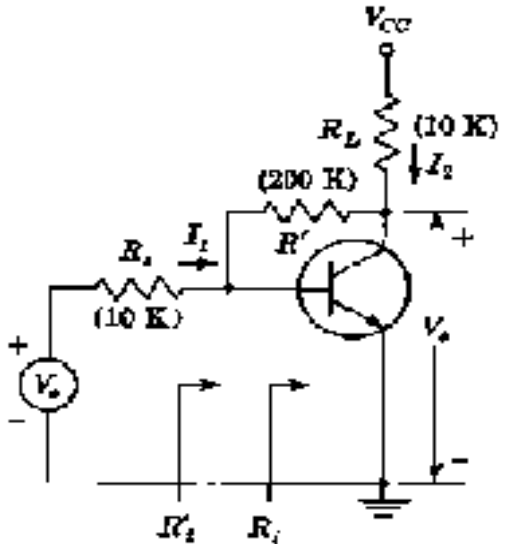
   b The h-parameters of a transistor used in a CE circuit are h_{ie} = 1k Ω, h_{re} = 2×10^{-4}, h_{fe} = 50 and h_{oe} = 25μA/V. The load resistance for the transistor is 1kΩ. 8M

   Determine A_I, R_I, A_V, Z_O, A_{IS} and A_{VS}. Assume R_S = 800 Ω.

UNIT-IV

7. a State and explain Miller Theorem. 6M

   b For the circuit shown in figure calculate Ri, Ri', A_V and A_I' = - I_2/I_1 8M



With parameters h_{ie} = 1.1k Ω, h_{re} = 2.5×10^{-4}, h_{fe} = 50 and h_{oe} = 24μA/V

(OR)

8. Derive the equations for A_I, R_I, A_V and R_O for a Common-collector configuration. 14M

UNIT-V

9. a Derive the expression for gain, input resistance and output resistance in current – series feedback amplifier with neat circuit diagram. 8M

   b Compare the effects of negative feedback on amplifier characteristics for different types of topology. 6M

(OR)

10. a Determine the method of identifying feedback topology and feedback factor. 7M

    b An amplifier has voltage gain with feedback of 200 before negative feedback is applied. When negative feedback with β=0.25 is applied, the nominal gain changes by 10%.Find the percentage change in overall gain. 7M

AR16

CODE: 16EC2011 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January, 2019

DIGITAL LOGIC DESIGN

(Common to CSE & IT)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) What is Number system? Explain. 4M
   b) Perform the subtraction with the following binary numbers using (r -1)'s complement of the subtrahend. 10M
      i) 1010 - 0111
      ii) 0111 - 1010

(OR)

2. a) Realize the following expression using NAND gates. 7M
      Y= A+B'C.
   b) Reduce the expression to minimum number of literals. 7M
      F= (B+BC) (B+B'C) (B+D)

UNIT-II

3. Obtain the Simplified expression in product of sums form using K- Map method 14M
   $F(A,B,C,D)=\sum m(0,1,2,3,4,5)+d(10,11,12,13,14,15)$. Also realize the reduced expression using the basic gates.

(OR)

4. With a neat logic diagram, explain the function of a carry look ahead adder circuit. 14M

UNIT-III

5. a) Design an Octal to Binary encoder circuit. 7M
   b) Design an 1- line to 8 line demultiplexer with a neat diagram and truth table. 7M

(OR)

6. Design a BCD to graycode convertor with truth table and logic diagram. 14M

UNIT-IV

7. Implement the following function using i)PROM ii) PAL 14M
   F=A**'BC+AC'+AB'C**

(OR)

8. Design a 3 bit binary to gray converter using a PLA Circuit. 14M

UNIT-V

9. a) Difference between combinational and sequential logic circuits 4M
   b) Explain about 10M
      i) SR latch using NOR gates
      ii) Clocked SR flip flop using NAND gates

(OR)

10. a) Design a MOD-6 counter with a suitable flip flop 7M
    b) Explain the operation of a Johnson Counter with neat timing diagrams and logic diagram. 7M

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