

SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY**B.E. Semester- (III) - MID SEMESTER EXAMINATION (Winter'14 Session)****SUBJECT: Advanced Engineering Mathematics (2130002)****Date:09-10-2014****TIME: 11:00 A.M. to 12:45 P.M****Total Marks: 40**

- Instructions:** 1. Question one is compulsory.
 2. Attempt any three from rest of the questions
 3. Figures to the right indicate full marks.
 4. Assume suitable data if required

Q-1 Select the correct answer from the option given for each question.

- (1) $\Gamma(n+1) =$ _____ . 07
 (a) $n\Gamma(n)$ (b) $n\Gamma(n+1)$
 (c) $(n+1)\Gamma(n+1)$ (d) $(n-1)\Gamma(n-1)$
- (2) Find the Order and Degree of $\left[\frac{dy}{dx} + y\right]^{\frac{1}{2}} = \sin x$
 (a) Order 1, Degree 1 (b) Order 1, Degree 2
 (c) Order 2, Degree 1 (d) Order 2, Degree 2
- (3) Solve $xy' + y = 0$.
 (a) $x + y = c$ (b) $xy = c$
 (c) $x/y = c$ (d) $x - y = c$
- (4) Two solutions $y_1(x)$ and $y_2(x)$ are said to be linearly dependent if ?
 (a) $w(y_1, y_2) \neq 0$ (b) $w(y_1, y_2) = 0$
 (c) $w(y_1, y_2) = 1$ (d) None of these
- (5) Laplace of $\sin kt =$ _____
 (a) $\frac{k}{s^2 + k^2}$ (b) $\frac{s}{s^2 + k^2}$
 (c) $\frac{k}{s^2 - k^2}$ (d) $\frac{s}{s^2 - k^2}$
- (6) Laplace of $3^t =$ _____
 (a) $\frac{1}{s-3}$ (b) $\frac{1}{s - \ln 3}$
 (c) $e^{-\ln 3}$ (d) None of these
- (7) The Particular Integral of $(D+1)^2 y = e^{-x}$ is?
 (a) $\frac{x^2}{2} e^{-x}$ (b) $\frac{x^2}{2} e^x$
 (c) $x^2 e^{-x}$ (d) $x e^{-x}$

- Q.2 (a)** Using method of undetermined coefficients, find the general solution of $y'' + 2y' + 10y = 25x^2 + 3$ **6**
- (b)** Obtain the Fourier series to represent the function **5**
 $f(x) = \frac{1}{4}(\pi - x)^2, 0 < x < 2\pi$
- Q.3 (a)** Solve using Laplace Transform **6**
 $y'' + 2y' + y = e^{-t}, y(0) = -1$ and $y'(0) = 1$
- (b)** Solve $\frac{d^2y}{dx^2} + 4y = \tan 2x$ by method of variation parameter. **5**
- Q.4 (a)** **6**
 (i) Solve: $(x+1) \frac{dy}{dx} - y = e^{3x} (x+1)^2$
 (ii) Solve the D.E. by the exact differential.
 $(x+1)e^x - e^y dx - xe^y dy = 0, y(1) = 0$
- (b)** Find Fourier Series for $f(x) = 2x - x^2$ in the interval (0,3) **5**
- Q.5 (a)** **6**
 (i) Using convolution theorem, determine $L^{-1} \left\{ \frac{a}{s^2 (s^2 + a^2)} \right\}$
 (ii) Find $L^{-1} \left\{ \ln \left(1 + \frac{w^2}{s^2} \right) \right\}$
- (b)** Solve $(D^2 + 3D + 2)y = \sin(e^x)$ **5**

SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

B.E. Semester- (III) - MID SEMESTER EXAMINATION (Winter'14 Session)

SUBJECT: Circuits and Networks (130901)

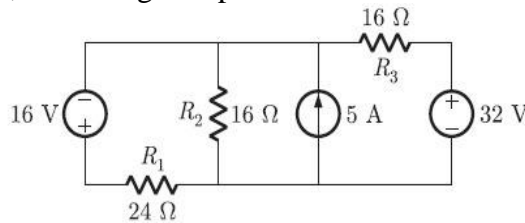
DATE:14/10/2014

TIME: 11:00 A.M. to 12:30 P.M

MAX. MARK: 40

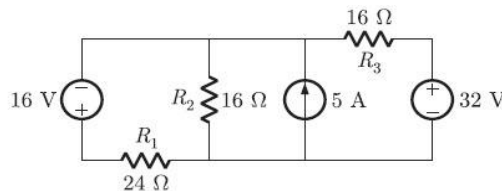
- Instructions:**
1. Question **one** is compulsory.
 2. **Attempt any three** from rest of the questions
 3. Figures to the right indicate full marks.
 4. Assume suitable data if required.

Q.1 (a) In the circuit below, the voltage drop across the resistance R_2 will be equal to **(1)**



- (A) 46 volt (B) 38 volt
 (C) 22 volt (D) 14 volt

(b) In the circuit below, current $I = I_1 + I_2 + I_3$, where I_1 , I_2 and I_3 are currents due to 60 A, 30 A and 30 V sources acting alone. The values of I_1 , I_2 and I_3 are respectively

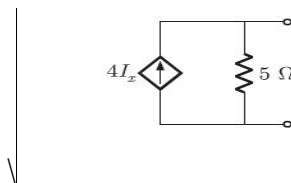


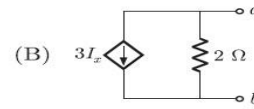
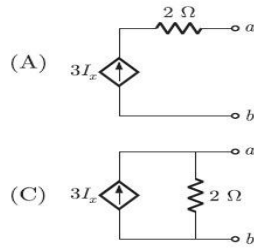
- (A) 8 A, 8 A, -4 A (B) 12 A, 12 A, -5 A
 (C) 4 A, 4 A, -1A (D) 2 A, 2 A, -4 A

(c) A network consists only of independent current sources and resistors. If the values of all the current sources are doubled, then values of node voltages **(1)**

- (a) remains same (b) will be doubled
 (c) will be halved (d) changes in some other way

(d) Consider a dependent current source shown in figure below. **(1)**





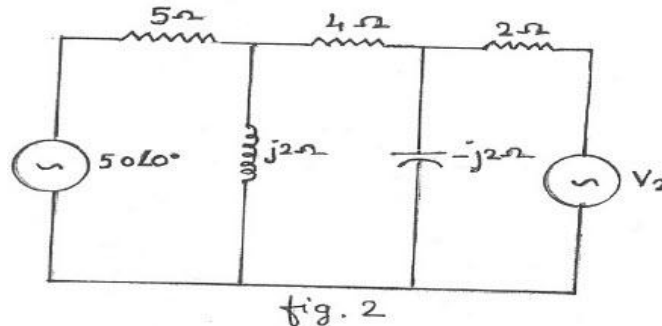
(D) None of these

- (e) If the voltage across a fixed value of resistance is increased five times, what does the current do? (1)
- (a) It increases by a factor of five. (c) It decreases by a factor of five.
- (b) It stays the same. (d) Not enough information

- (f) If the voltage across a fixed value of resistance is increased five times, what does the current do? (1)
- (A) the resistor value decreased (c) the resistor value did not change
- (b) the resistor value increased (d) the resistor value increased

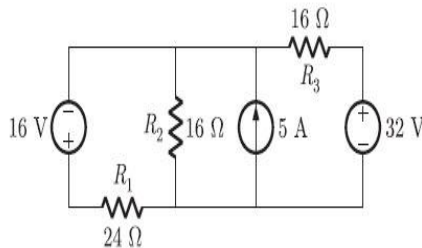
- (g) The formula to find I when the values of V and R are known is (1)
- (a) $I = VR$ (c) $I = R/V$
- (b) $V = IR$ (d) $I = V/R$

- Q.2 (a) In the network of using node analysis find V_2 which results in zero current through 4Ω resistor. (6)

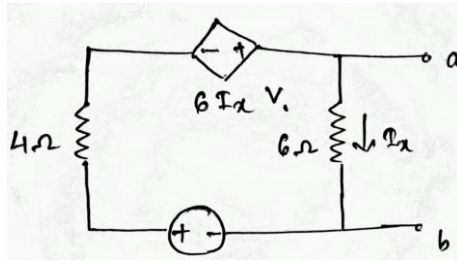


- (b) Show that h – parameter will not exist for a two-port network when $Z_{22}=0$. (5)

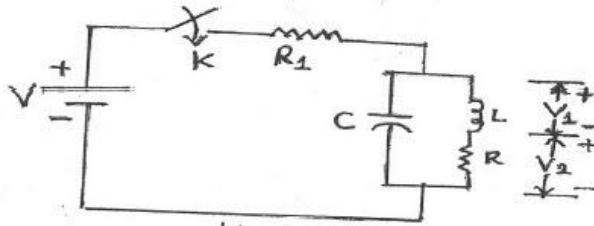
- Q.3 (a) In the circuit below, the voltage drop across the resistance R_2 will be equal to using mesh analysis? (5)



- (b) Determine the Norton's equivalent circuit across the terminal a-b in the given network below (6)

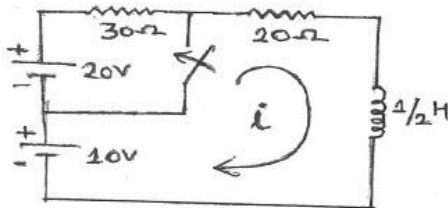


- Q.4 (a)** For the network shown in switch K is closed at time $t = 0$ with zero inductor current and zero capacitor voltage. Solve for **(6)**
- (i) V_1 and V_2 at $t = 0+$
 - (ii) V_1 and V_2 at $t = \infty$
 - (iii) dV_1/dt and dV_2/dt at $t = 0$
 - (iv) d^2V_2/dt^2 at $t = 0+$

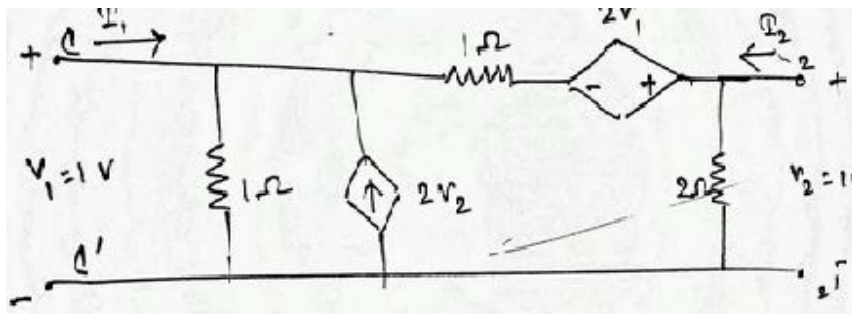


- (b)** State and explain Reciprocity theorem with an example **(5)**

- Q.5 (a)** In the network of steady state is reached with switch K open. At $t = 0$ switch K is closed. Find $i(t)$ for the numerical values given. **(6)**



- (b)** Determine Z parameter for the network given below **(5)**

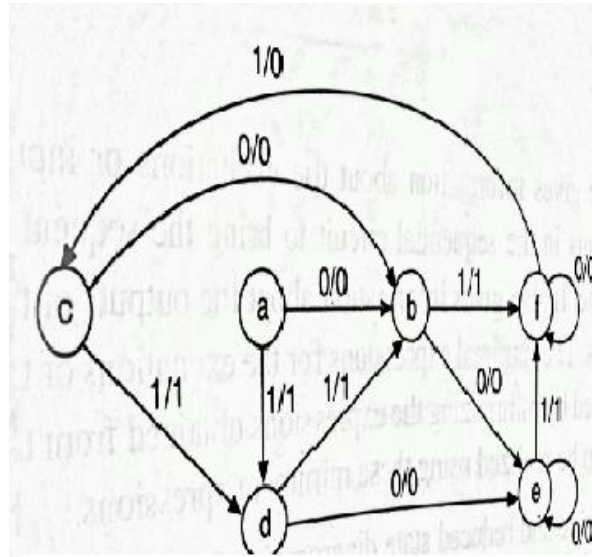


SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY**B.E. Semester- (III) - MID SEMESTER EXAMINATION (winter'14 Session)****SUBJECT: Digital Electronics (2131004)****Date:** 11-10-2014**TIME:** 11:00 A.M. to 12:30 P.M**Total Marks:** 40

- Instructions:**
1. Question **one** is compulsory.
 2. **Attempt any three** from rest of the questions
 3. Figures to the right indicate full marks.
 4. Assume suitable data if required.

- Q.1 (a) What is the 11's complement of $(935)_{10}$? 07
- a) 286 b) 132
 c) 265 d) 824
- (b) Which of following is universal flip flop?
- a) RS flip flop b) D flip flop
 c) None of These d) Master Slave D flip flop
- (c) In a sequential circuit the next state is determined by _____ and _____
- a) state variable, current state b) Current state, flip flop output
 c) Current state and external input d) Input and clock signal applied
- (d) _____ is said to occur when multiple internal variables change due to change in one input variable
- a) Hold delay b) Hold and Wait
 c) Clock Skew d) Race condition
- (e) 2 Nibble consist of _____ bits
- a) 2 b) 6
 c) 4 d) 8
- (f) Addition of two octal numbers "36" and "71" results in _____
- a) 213 b) 123
 c) 127 d) 345
- (g) What is the gray code of $(110101)_2$
- a) 010110 b) 110101
 c) 100010 d) 101111
- Q.2 (a) Simplify the following Boolean function by means of the Quine McClusky method: $F(A,B,C,D,E) = \sum(1,2,4,9,16,20,28,38,39,52,60)$ 06
- (b) What is Multiplexer? Draw and explain logic circuit of 16:1 MUX using 4:1 MUX. 05

- Q.3 (a) What is Synchronous Counter? Construct synchronous counter which counts 2, 6, 3, 9, 11 using T flip flop. 06
 (b) With logic circuit explain the working of 4-bit magnitude comparator. 05
- Q.4 (a) Explain PLA in detail. 06
 (b) Reduce the State Diagram given below. Make state table and transition table of reduced state diagram. 05



- Q.5 (a) Convert the decimal number 167 to base 3, base 4, base 7, base 8 and base 16 05
 (b) Obtain the simplified expression in sum of product for the following Boolean functions. (a) $F = \Sigma(0,1,4,5,10,11,12,14)$ using K- MAP and (b) $F = \Sigma(2, 3, 7, 11, 12, 13, 14, 15)$ using V-MAP. 06

SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

B.E. Semester- (III) –MID SEM EXAMINATION (Winter'14 Session)

SUBJECT: Electronics Devices and Circuits (2131006)

Date:16-10-2014

TIME: 2:00 A.M. to 3:30 P.M

Total Marks: 40

Instructions: 1. Question one is compulsory.

2. Attempt any three from rest of the questions

3. Figures to the right indicate full marks.

4. Assume suitable data if required.

- | | | |
|-----|---|-------------|
| Q.1 | <p>Give the answer of following</p> <p>1 PIV (Peak Inverse Voltage) of Half Wave rectifier is
 (a) $2V_m$ (b) V_m (c) $V_m/2$ (d) V_m/π</p> <p>2 Dark current flows in
 (a) forward (b) Reverse (c) a,b (d) none of above</p> <p>3 Zener Diode works as voltage regulator in
 (a) Forward Biasing (b) No Biasing
 (c) Reverse Biasing (d) a,b & c</p> <p>4 P-N diode also called
 (a) Schottky Diode (b) Tunnel Diode
 (c) Varactor Diode (d) Pin Diode</p> <p>5 In class-c amplifier Q-point lies in
 (a) Saturation (b) Cut-off (c) Center (d) Below Cut-off</p> <p>6 If $V_m=2V$ what is the value of V_{Ldc} in Half Wave rectifier
 (a) 7.072135V (b) 5V (c) 3.184713V (d) 20V</p> <p>7 In positive clamper we get output shifted in
 (a) Positive (b) Negative (c) 90° (d) 180°</p> | 7 |
| Q.2 | <p>A Define the terms</p> <p>(a) (PIV)
 (b) Dark current
 (c) Barrier potential
 (d) Avalanche Breakdown
 (e) Mean life time of carrier
 (f) Surge current</p> | 6 |
| Q.3 | <p>B Explain the VI characteristics and draw difference between Si & Ge</p> <p>A Explain Hall effect. Also write the Equation of hall voltage with application.</p> <p>B Explain zener Diode work as voltage regulator with circuit diagram.</p> | 5
6
5 |
| Q.4 | <p>A What is transistor stabilization? Explain analysis of VDB with circuit diagram.</p> <p>B Classification of power amplifier. Explain any one of them</p> | 5
6 |

- Q.5 A Explain full wave rectifier with wave form. Give the Values of 6
(a) V_{dc} (b) V_m (c) V_{rms} (d) I_{rms} (e) I_{rms} (f) R.F
- B (a) Draw the circuit diagram of CE configuration. also draw the 3
output characteristics and derive the equation $\alpha = \beta / \beta + 1$
- (b) Draw the waveform of following circuit 2

Q 4	a)	Explain Directing and Controlling as functions of management and two natures of Planning and Organizing.	05
	b)	Explain the following:	06
		1) Short run Cost and Long run Cost 2) Fixed and Variable Cost 3) Opportunity Cost 4) Average and Marginal Cost	
Q 5	a)	Define demand forecasting and explain three methods of demand forecasting.	05
	b)	What is Demand? Explain Law of Demand.	06

SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY**B.E. Semester-III (EC) - MID SEMESTER EXAMINATION****SUBJECT: (2131005) Electrical Machine****DATE: 15/10/2014****TIME: 11:00 to 12:30 pm****TOTAL MARK: 40**

- Instructions:
1. Question – 1 is compulsory.
 2. Attempt any 3 out of remaining 4.
 3. Figure to the right indicates full marks.
 4. Assume Suitable data if required.

Q.1 Answer the following questions.

(07)

- 1) DC motor yoke is generally made of
 - (a) wood
 - (b) copper
 - (c) Cast Iron
 - (d) aluminum
- 2) A transformer is a constant
 - (a) Current device
 - (b) Voltage device
 - (c) Main flux device
 - (d) Power device
- 3) During parallel operation of transformers incorrect polarity will result in
 - (a) Open circuit
 - (b) Regeneration of power
 - (c) Dead short circuit
 - (d) Power factor will be different from that of the connected load
- 4) In performing the short circuit test of a transformer
 - (a) High-voltage side is short-circuited
 - (b) Any side is short-circuited with preference
 - (c) Low-voltage side is short-circuited
 - (d) None of these
- 5) The function of a Commutator in a DC machine is
 - (a) to provide easy speed control
 - (b) to improve commutation
 - (c) to convert AC Emf to DC Emf
 - (d) to convert ac current to DC current
- 6) The back Emf of a motor at the time of starting is
 - (a) maximum
 - (b) minimum
 - (c) zero
 - (d) optimum
- 7) Series motors have a relatively
 - (a) medium starting torque
 - (b) low starting torque
 - (c) high starting torque
 - (d) zero starting torque

- Q.2 (A) Draw 3 point starter for DC shunt motor and explain NVC & OLR. (05)
- Q.2 (B) Explain open delta connection of transformer. (03)
- Q.2 (C) Explain the following terms. (03)
- 1) Feeders 2) Distributors 3) Supply mains
- Q.3 (A) Derive the expressions for the torque developed in DC motor. (05)
- Q.3 (B) A 30 KVA, 2400/240 V, 50 Hz transformer has a high voltage winding resistance of 0.1 ohm and reactance of 0.22 ohm. The low voltage winding resistance is 0.035 ohm and reactance is 0.012 ohm. Find the equivalent winding resistance, reactance and impedance referred to the high voltage side. (03)
- Q.3 (C) Give Comparison of AC & DC distribution systems. (03)
- Q.4 (A) Define power factor. And explain any two power factor improving methods. (05)
- Q.4 (B) Determine Armature torque and Shaft torque of 220 V , 4-pole, series motor with 800 conductors wave connected supplying a load of 8.2KW by taking 45 A from the mains. The flux per pole is 25 mwb and its armature circuit resistance is 0.6 ohm. (03)
- Q.4 (C) Draw and explain the phasor diagram of transformer on no load. (03)
- Q.5 (A) Derive the Emf equation of 1- phase transformer. **And** calculate no. of turns on both primary and secondary for following given data. A 10 KVA, 500/250 v, 50 Hz, 1-phase transformer has a net area of cross section 30 cm^2 and max flux density is 1.2 Tesla. (05)
- Q.5 (B) Define the following terms. (03)
- 1) Diversity factor 2) Plant utilization factor
- 3) Demand factor
- Q.5 (C) Draw Schematic diagram of a DC machine with labels. Also state functions of (03)
- (i) Pole shoe
- (ii) Commutator

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