

GTU MODEL QUESTION PAPER – 2

Instructions: 1. Question No. 1 is compulsory. Attempt any four out of remaining six questions.

SUBJECT : BASIC ELECTRONICS (2110016)

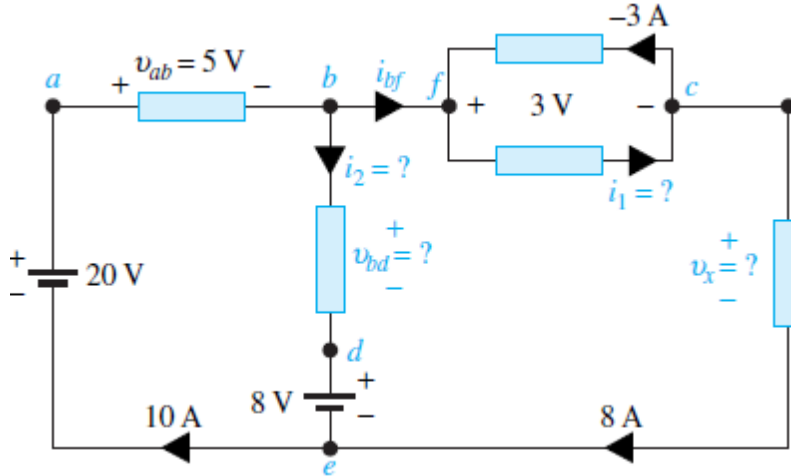
Total Marks : 70

SEM : 2ND

- Q.1 A (1) For better Immunity to noise _____ Modulation technique is preferable. 7
(a) DSB-FC (b) FM (c) DSB-SC (d) SSB-SC
- (2) $(255)_{10} = (\quad)_2$
(a) 11110111 (b) 11001100 (c) 11101111 (d) 11111111
- (3) From the given statements identify which one is wrong for ideal – op amp
(a) Input Resistance is infinite
(b) Output Resistance is infinite
(c) Slew rate is infinite
(d) Common Mode Rejection Ration is infinite
- (4) A Medium can be shared by number of user at the same time on different frequency is known as
(a) Code Division Multiplexing.
(b) Time Division Multiplexing.
(c) Frequency Division Multiplexing.
(d) None of Above.
- (5) According to coloumb’s Law electric force is inversely proportional to
(a) Distance. (b) Square of the distance.
(c) Multiplication of charge Q_1 & Q_2 . (d) None of Above.
- (6) Node Voltage Analysis can be used to find.
(a) Current at each node. (b) Current in all branches.
(c) Current in all Branches. (d) None of above.
- (7) For closed loop control system choose the correct option.
(a) Output of system is depending on input signal.
(b) Output of system is depending on output of signal.
(c) Output of system is depending on input signal as well as output signal of the system.
(d) Output of system is Independent on output of signal.
- B Match the following. 7
- | | |
|--------------------------------|---|
| 1. PCM. | A. Frequency Translation. |
| 2. Race Around can be solve by | B. Define Speed of Operation. |
| 3. Mobile Communication. | C. Half Duplex. |
| 4. Modulation. | D. Full Duplex. |
| 5. Slew Rate. | E. Convert Analog Signal into Digital Signal. |
| 6. Wilkie – Talkie. | F. Master Slave JK FF. |
| 7. Error Detection Correction. | G. Data Link Layer. |
- Q.2 A Explain the Maximum Power Transfer therom and also find the condition to obtain maximum power transfer from source to load 7
- B Draw Non Inverting OP-amp circuit and derive an equation for Gain. Also Modify Circuit for voltage Follower. 7
- Q.3 A Draw the logic diagram for the following Boolean Expression (Without Simplification) 4
- (i) $Y = A \cdot B + \bar{A} \cdot \bar{B} \cdot \bar{D} + \overline{ABC} + B \bar{C} + \bar{B}C$
- (ii) $Y = (A+B) \cdot (\bar{A} + \bar{B} + \bar{C}) \cdot (B+\bar{C}) \cdot (\bar{A}+C)$

- B Draw the logic diagrams for the following given 3
- (i) Boolean expression
- (ii) Simplified (Minimized) equation
- $$Y = ABC + BC + AB\bar{C} + BCD$$
- C Define Amplitude Modulation. Brief Compare Various AM Techniques. Explain Modulation Process with help of Waveform. 7

Q.4 A 7

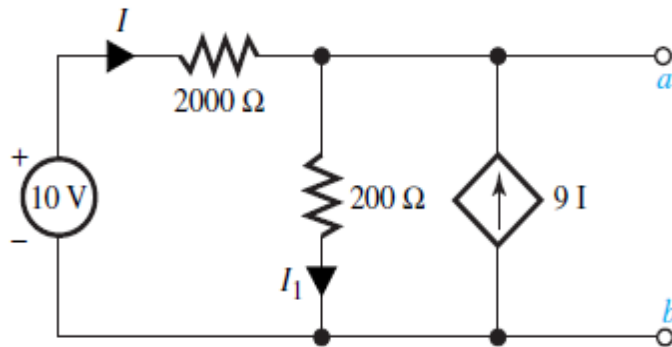


For the given circuit use KCL and KVL and find i_1, i_2, V_{bd}, V_x and V_{eb}

- B Draw and explain 7
- (i) Step Motor Control System for Read-Write Head Positioning on a disk drive
- (ii) Position Servo in a RADAR System.

Q.5 A Enlist Practical Properties of OP-amp and define any four. 7

B 7



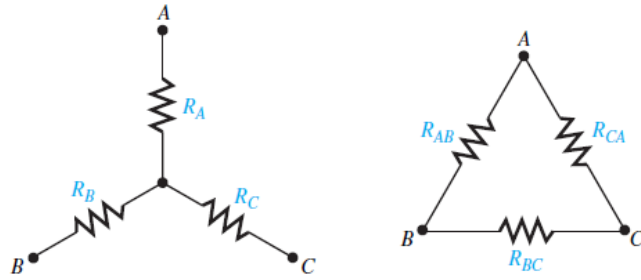
For the given network obtain Thevenin's and norton's equivalent ckt between point a and b.

Q.6 A Do as directed : 4

- (a) Draw the frequency (spectrum) diagram for sampled signal for the following case. Also comment on Reconstruction of signal
- (1) $F_s = 4 \text{ KHz}, F_m = 2 \text{ KHz}$ (3) $F_s = 4 \text{ KHz}, F_m = 3 \text{ KHz}$
- (2) $F_s = 4 \text{ KHz}, F_m = 4 \text{ KHz}$
- (Where F_s is sampling frequency and F_m is Modulating frequency)

B

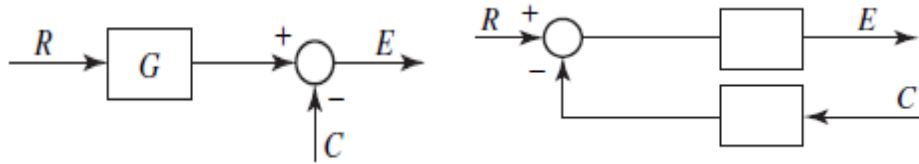
3



For above given network find R_{AB} , R_{BC} , R_{CA} if $R_A = R_B = R_C = 10\Omega$

C

3

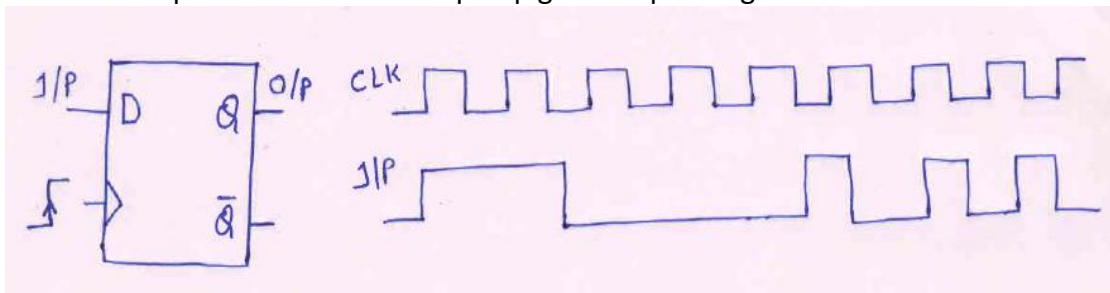


Filling the blocks for converting the control system given in Fig 1 to Fig 2

D

4

Draw the output wave form of D flip flop given as per diagram



Q.7 A

7

Suggest digital circuit for the following case study.

There is a museum developed in fort of king. each room are decorated with some ancient memory. It is from 10 AM to 2 PM and 5 PM to 8 PM. You have to suggest digital circuits for

- (a) No. of visitors per day
- (b) Automatic lights on/off in each room depending on visitor enters in the room and leaves the room

B

7

A varying analog signal presents upto 2 KHz frequency. It is sampled with train of pulse of 8 KHz. We need to use 32 level quantization. Calculate

- (a) Sample per cycle
- (b) Sample per second
- (c) Bit per cycle
- (d) Bit per second