Bangladesh Army University of Science and Technology

Department of Computer Science and Engineering

Referred/Improvement/Backlog Examination, Fall 2018 **Level-2 Term-II**
Course Code: CSE 2205 **Course Title: Digital Electronics and Pulse Technique**
Time: 03 (Three) hours **Full Marks: 210**

N.B. (i) Answer any three questions from each PART (ii) Use separate answer script for each PART
(iii) Marks allotted are indicated in the margin (iv) Symbols have their usual meanings

PART A

(Answer any three questions)

1. a) What is Digital Electronics? Write down five advantages of Digital Electronics. **5+10**

b) Define Diode. Draw 2-input diode AND and OR logic gates. **5+10**

c) Write down three leads (legs) name of transistor explain why they are used for? **5**

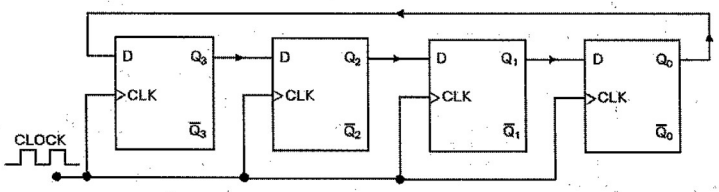
2. a) Write down classification of Digital logic families in a block diagram. **10**

b) Briefly explain the operation of TTL NOR gate and CMOS OR gate. **5+5**

c) Write down types of Flip-flop? Differentiate latches from flip-flops? **5+10**

3. a) Define the terms: (i) Propagation delay, (ii) Fan-in, (iii) Fan-out and (iv) Noise margin **12**

b) Describe the operation of the following circuits diagram: **8**



c) What is Counter? Design 3-Bit Synchronous Counter from excitation and truth table of J-K Flip Flop. **3+12**

4. a) What is Universal Shift Register? What is it used for? **6**

b) Describe 4-bit Bidirectional shift register operation with block diagram. **10**

c) Write short notes on : (i) ROM, (ii) PAL and (iii) PLA **9**

d) Draw the PAL circuit diagram for the following equations **10**

$$F1 = C' + A'B'$$
$$F2 = A'BC' + AC + AB'$$
$$F3 = AD + BD + F1$$
$$F4 = AB + CD + F1'$$

PART B

(Answer any three questions)

5. a) State the purpose of ADC and DAC. **10**

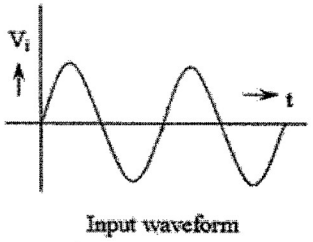
   b) Why is PCM used? Describe Sampling, Holding, Quantization, and Binary Encoding steps of PCM with appropriate diagram. **20**

   c) Explain the operation of a binary weighted resistor of DAC. **5**

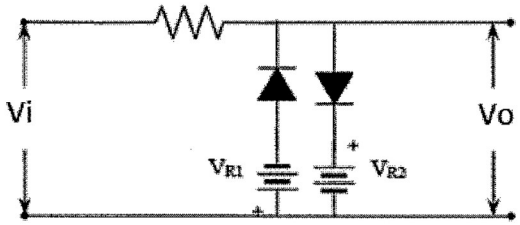
6. a) Define and describe Clipper and Clamper with Circuit diagrams. **10**

   b) What if filter? Describe operation of RC low pass filter where RC>>T and RC high pass filter where RC<<T with circuit diagrams and expected output wave shapes. **5+10**

   c) Draw the output wave to the circuit shown in the figure below: **10**



Input waveform

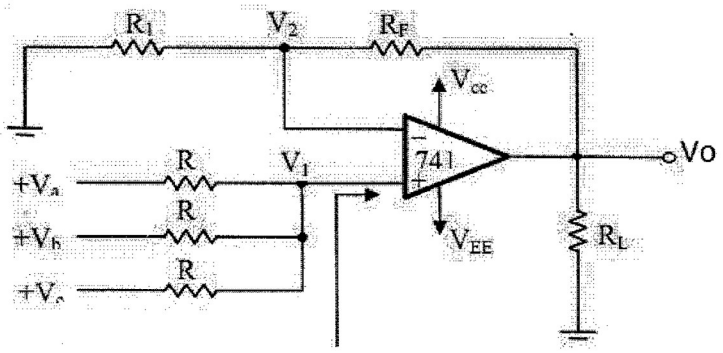


7. a) What do you mean by Multivibrator? Describe monostable Multivibrator with circuit diagram. **5+10**

   b) Define oscillator. Write its application areas. **5+5**

   c) What are the features of a Schmitt trigger? Represent a scenario where Schmitt trigger performs better than a normal comparator. **10**

8. a) What is Op-amp? Describe the operation of the following circuit diagram. **5+5**



   b) What is V_{out} for summing amplifier and averaging amplifier if the input voltage are +5.0V, -3.0V and +4.5V and all resistors are 10kΩ. **10**

   c) Determine R_1, R_2 and V_{ref}, if UPT=2.5V, LTP=1.0V and V_{sat}=12V. **9**

   d) Write down uses and advantages of pulse transformer. **6**