

# **Bajaj College of Science, Wardha**

## **Practice Sheet During Lockdown**

### **B.Sc. SEM II**

#### **Subject: Electronics**

#### **UNIT I: Long Answer Type Questions**

1. Explain various amplifier parameters and notations.
2. What are h-parameters? Explain how forward and reverse parameters are derived in two-port network.
3. Derive the equations for  $A_i$ ,  $A_{is}$  and  $Z_i$  using hybrid parameters.
4. Derive the equations for  $A_v$ ,  $A_{vs}$ ,  $A_p$  and  $Y_o$  using hybrid parameters.
5. Explain classification of amplifiers.
6. Explain classification of amplifiers on the basis of biasing.
7. Explain RC coupled amplifier and its frequency response.
8. Draw the circuit diagram of transformer coupled amplifier and explain its operation and frequency response.
9. Explain construction and working of n-channel JFET and its V-I characteristics.
10. Explain construction and working of depletion MOSFET and explain its operation in enhancement and depletion mode.

#### **Short answer type questions:**

1. Draw hybrid equivalent circuit of CE amplifier.
2. What is two-port network? Draw two-port resistive network.
3. State any four differences between BJT and FET
4. Draw the symbols of n-ch and p-ch JFET
5. Draw the symbols of depletion and enhancement MOSFET
6. State application of FET
7. Define  $\mu$ ,  $g_m$  and  $r_d$
8. Define  $I_{DSS}$
9. Draw frequency response of direct coupled amplifier
10. What is cascading of amplifiers? State the effect of Cascading on gain and bandwidth.

**Stay at Home and Stay Safe!**

## **UNIT II: Long Answer Type Questions**

1. Differentiate: Voltage and Power amplifiers
2. Derive the equation for  $R_L'$  in case of transformer coupled amplifier
3. Draw the circuit diagram of transformer coupled class A amplifier and explain its operation with the help of load line.
4. Derive an expression for efficiency of class A amplifier.
5. Draw the circuit diagram of class B push-pull amplifier and explain its operation with the help neat waveforms.
6. Derive an expression for efficiency of class B amplifier.
7. Explain construction and working of complementary symmetry class B power amplifier.
8. What is cross-over distortion? How it can be resolved? Explain.
9. A transformer coupled class A amplifier supplies power to a 80 ohm load connected across the secondary of a step-down transformer of turns ratio 5:1. Determine the maximum power output for zero-signal collector current of 120mA.

### **Short answer type questions:**

1. What is multistage amplifier?
2. State main characteristics of power transistor.
3. State any two differences between voltage and power amplifiers.
4. What is thermal run away?
5. Draw the circuit diagram of transformer coupled class A amplifier.
6. State the values of  $V_{CEQ}$  and  $I_{CQ}$  in class A amplifier.
7. State the advantages of Class A operation.
8. State the advantages of Class B operation.
9. State disadvantages of Class A operation.
10. State advantages and disadvantages of complementary symmetry class power amplifier.

## **UNIT III: Long Answer Type Questions**

1. Explain construction and working of SCR. Also explain its V-I characteristics.

2. Explain working of SCR using two transistor analogy. Draw its V-I characteristics for various biasing conditions.
3. What are forward blocking and conducting modes of SCR? Explain.
4. State various application of SCR.
5. Explain construction of Triac and its V-I characteristics.
6. Explain operation of Triac in four different modes.
7. State various application of Triac.
8. Explain construction and working of Diac. Also explain its V-I characteristics.
9. Explain construction and working of UJT. Draw its characteristics and explain various values of current and voltages on characteristics.
10. Explain sawtooth oscillator using UJT and derive the equation for frequency of output wave.

**Short answer type questions:**

1. What is SCR? Draw its symbol.
2. Define holding and latching current.
3. Is it possible to make SCR conducting without gate voltage? Explain.
4. State any two application of SCR.
5. State the fullform of TRIAC and draw its symbol.
6. In triac, why terminals are not defined as Anode and Cathode?
7. State the application of diac.
8. How triac can be used as diac?
9. What is UJT? Draw its symbol.
10. What do you mean by intrinsic stand-off ratio in UJT?

**UNIT IV: Long Answer Type Questions**

11. Draw and explain with logic diagram, RS Flip-Flop using NAND-gates and write its Truth Table.
12. Draw and explain with logic diagram, RS Flip-Flop using NOR-gates and write its Truth Table.
13. Draw and explain with logic diagram, the clocked RS Flip-Flop using NAND-gates and write its Truth Table.

14. Draw and explain with logic diagram, the clocked RS Flip-Flop using NOR-gates and write its Truth Table.
15. Draw the logic diagram of DFF and explain its working.
16. Draw the logic diagram of JKFF using NAND gates and explain its working.
17. Draw the logic diagram of JKMS flip-flop and explain its working in brief.
18. Discuss race around Condition in JKFF along with timing diagram. How can it be minimize?
19. What is Race-Around-Condition in a JKFF? List different methods for avoiding Race-Around-Condition. Explain any one of it in detail.
20. Explain: i) Propagation delay time ii) set up time and iii) hold time of a flip-flop.

### **Short Answer Type Questions**

1. State the function of PRESET and CLEAR in flip-flop.
2. Why PRESET and CLEAR terminals are called asynchronous inputs?
3. Define Propagation delay time of flip flop.
4. Define Set up time of a flip flop.
5. Define Hold time of a flip flop.
6. Draw the logic symbol of a negative edge triggered clocked RSFF.
7. Draw the logic symbol of a negative edge triggered clocked JKMSFF with PRE and CLR terminals.
8. What is forbidden or invalid state in RSFF?
9. Differentiate: Edge triggered flip-flop over level triggered flip flop.
10. Differentiate: RS and clocked RSFF.

### **UNIT V: Long Answer Type Questions**

1. Explain the working of MOD-8 synchronous binary counter with suitable diagram. Draw its timing diagram and truth table.
2. Explain the working of MOD-8 asynchronous binary counter with suitable diagram. Draw its timing diagram and truth table.
3. Explain Johnson counter with truth table and timing diagram.
4. Draw and explain decade counter with its logic diagram, truth table and timing diagram.

5. What is modified counter? Explain MOD 7 counter using 7490 IC with its logic diagram and truth table.
6. Explain Ring counter with truth table and timing diagram.
7. What is a shift register? Explain the working of 4 bit SISO shift register with truth table.
8. What is a shift register? Explain the working of 4 bit SIPO shift register with truth table.
9. What is a shift register? Explain the working of 4 bit PISO shift register with truth table.
10. What is a shift register? Explain the working of 4 bit PIPO shift register with truth table.

### Short Answer Type Questions

1. Draw a logic diagram of Mod 7 counter using 7490 IC.
2. Draw a logic diagram of Mod 8 counter using 7490 IC.
3. What is modulus of a counter?
4. Draw a logic diagram of Mod 10 counter using 7493 IC.
5. Draw a logic diagram of decade counter counter using 7493 IC.
6. What is the function of  $R_{0(1)}$  and  $R_{0(2)}$  terminals on 7493 IC?
7. Draw a logic diagram of Mod 6 counter using 7493 IC.
8. What is the function of  $R_{9(1)}$  and  $R_{9(2)}$  terminals on 7490 IC?
9. What is a buffer register?
10. Draw a logic diagram of PIPO register.

### UNIT VI: Long Answer Type Questions

1. Explain the construction and working of
  - i) TTL NAND gate and
  - ii) CMOS NOR gate.
2. Explain the construction and working of
  - i) TTL NOR gate and
  - ii) CMOS NAND gate.
3. Explain
  - i) Propagation delay
  - ii) Noise immunity
  - iii) Noise Margin and
  - iv) Fan – in and Fan – out of a logic family.
4. Compare TTL and CMOS logic family.

5. Draw a logic diagram of expanded memory of size 4 KB obtained from available memory chips of size 1 KB. Give its memory map.
6. Draw a logic diagram of expanded memory of size 4KX8 obtained from available memory chips of size 1 KB. Give its memory map.
7. Draw a logic diagram of expanded memory of size 32X4 obtained from available memory chips of size 16X4. Give its memory map.
8. Draw a logic diagram of expanded memory of size 16X8 obtained from available memory chips of size 16X4. Give its memory map.
9. Draw a logic diagram of expanded memory of size 2KB obtained from available memory chips of size 1 KB. Give its memory map.
10. Draw a logic diagram of expanded memory of size 32X8 obtained from available memory chips of size 16X4. Give its memory map.

### **Short Answer Type Questions**

1. What is EPROM?
2. What is EEPROM?
3. What is the advantage of totam pole arrangement in TTL logic family?
4. What is the difference between noise margin and noise immunity?
5. Define fan in and fan out of a logic family.
6. State any two advantages of CMOS logic family over TTL logic family.
7. State any two advantages of TTL logic family over CMOS logic family.
8. Give the classification of memory
9. How many address lines are required to address 1MB memory?
10. What is the function of chip select terminal on memory chip?