Code:2305/R

**Faculty of Science**

**B. Sc (Electronics) I-Year, CBCS –II Semester**

**Regular Examinations -June/July, 2022**

**Paper-II: Electronics Devices**

Time: 3 Hours                                                                 Max Marks: 80

**Section-A**

I. Answer any *eight* of the following                              (8x4=32 Marks)

1. How does the reverse saturation current in a p-n junction diode vary with temperature.
2. Write about varactor diode.
3. The dielectric constant of Ge is 16.Calculate the barrier capacitance of P-N junction whose area is $1 \times 10^{-6}$ m$^2$ and whose space charge thickness is $2 \times 10^{-4}$ cm.
4. Define h-parameter and write a short note on them.
5. Draw the circuit of self bias and explain.
6. A transistor has $I_{CBO}$=48n A and α=0.992. Find β and $I_{CEO}$ .
7. What are the advantages of FET.
8. Explain why UJT is called double based diode.
9. For a JFET type BFW10, the typical values of amplification factor and trans conductance are specified as 80 and 200µCalculate the dynamic drain resistance of this JFET.
10. How does SCR differ from an ordinary rectifier.
11. Write about Photo voltaic cells.
12. The forward break over voltage of an SCR is 150volt when the gate current is 1m-A. Find the average power output when sinusoidal input voltage of peak value 200volts is used.

**Section-B**

II. Answer the following                                              (4x12=48 Marks)

13. (a) Explain the construction, working and characteristics of a P-N junction diode.

(OR)

(b) Describe the construction and working of a tunnel diode. Sketch its V-I characteristics and indicate the negative resistance region.

14. (a) Describe the experimental arrangement of CB configuration of transistor. Show the input and output characteristics.

(OR)

(b) Explain working of PNP and NPN transistors. And show that emitter current is addition of collector and base currents.

15. (a) Describe the construction and working of a depletion MOSFET and explain their characteristics.

(OR)

(b) Explain the operation and construction of UJT. Draw its characteristics curve with the help of experimental setup.

16. (a) Explain the construction and working of an SCR. Draw its V-I characteristics. Write its applications.

(OR)

(b) What is a light-emitting diode? Describe it. Mention its advantages and disadvantages. What are the important applications of an LED.

*****

**Faculty of Science**

**B. Sc (Electronics) I-Year, CBCS –II Semester Backlog Examinations –Jan, 2023**

**PAPER: Electronics Devices**

Time: 3 Hours

Max Marks: 80

**Section-A**

I.  Answer any *eight* of the following questions          (8x4=32 Marks)

1.  Explain tunneling phenomenon.
2.  How does the reverse saturation current in P-N junction diode vary with temperature?
3.  Calculate the barrier potential for the junction at $75^0$C, if its value at $25^0$C is 0.7V.
4.  Explain load line analysis.
5.  Define stability factor. Draw a fixed base bias circuit.
6.  For a transistor $\beta=40$ and $I_B=25\mu A$. Find the value of $I_E$.
7.  Explain any one method for biasing a FET.
8.  Explain the operation of UJT as a switch.
9.  A Uni junction transistor has 10V between the bases. If the intrinsic standoff ratio is 0.65, find the value of standoff voltage. What will be the peak point voltage if the forward voltage drop in the p-n junction is 0.7V.
10. Explain how an SCR operates as a switch.
11. Write a short note on photo voltaic cell.
12. Calculate the open circuit voltage and the output power at a voltage of 0.35volt for a solar cell having reverse saturation current of 1nanoampere at 300K, having photo current of 100m-A and cell area 4cm$^2$(thermal voltage at 300K is 0.0258volts).

**Section-B**

II. Answer the following questions          (4x12=48 Marks)

13. (a) Explain the construction, working  and characteristics of P-N junction diode. And obtain diode current equation.

(OR)

(b) Describe construction, working and characteristics of Zener diode. And explain how Zener diode acts as a voltage regulator.

14. (a) Discuss various methods used for transistor biasing. State their advantages and disadvantages.
(b) In a common base configuration, with a base current of 0.005mA, the emitter current is 1mA. Calculate the value of collector current.

(OR)

(c) Draw the CE circuit of a transistor, sketch its input and output characteristics. Indicate the active, saturation and cut off regions.

15. (a) Describe the construction and working principle of JFET. And obtain equation of Drain current.

(OR)

(b) What is UJT? Describe V-I characteristics of a UJT. Explain the use of negative resistance behavior.

16. (a) Describe the structure of SCR. Draw its volt-ampere characteristics and explain with a suitable diagram how can it be used as a power control device.

(OR)

(b) Describe the operation of photo diodes and show its current voltage characteristics. What are the advantages and disadvantages?

*****

**Faculty of Science**

**B.Sc (Electronics) I-Year, CBCS –II Semester Regular Examinations –June, 2023**

**PAPER: Electronic Devices**

Time: 3 Hours                                                                    Max Marks: 80

**Section-A**

I. Answer any *eight* of the following questions                              (8x4=32 Marks)

1. Explain the tunneling phenomenon.
2. Write about varactor diode.
3. The reverse bias saturation current for a p-n junction diode is $1\mu A$ at 300K. Calculate its ac resistance at 150m V forward bias.
4. Draw the circuit of self-bias and explain.
5. Define h parameters and write a short note on them.
6. For a transistor $\alpha$=0.98 and emitter current $I_E$=2.5 m A. Calculate collector current and base current.
7. Write the differences between FET and MOSFET.
8. Write the applications of UJT.
9. When $V_{GS}$ of a FET changes from -3.1V to -3V the drain current changes from 1m A to 1.3m A. What is the value of transconductance.
10. Explain how an SCR operates as a switch.
11. Write a short note on Solar cell.
12. In an SCR full wave rectifier, supply voltage is 200V and load resistance $1k\Omega$. Calculate the power delivered to the load for firing angle $120^{o}$ .

**Section-B**

II. Answer the following questions                                            (4x12=48 Marks)

13.(a) Explain the construction, working and characteristics of a p-n junction diode.

(OR)

(b) Discuss how a Zener diode acts as a voltage regulator to maintain constant output voltage.

14.(a) Explain the working of n-p-n and p-n-p transistors.

(OR)

(b) Draw the CE circuit of a transistor, sketch its output characteristics. Indicate the active, saturation and cutoff regions.

15.(a) Discuss the basic structure of an n-channel JFET. Explain its operation n detail.

(OR)

(b) Explain the operation and construction of UJT. Draw its characteristics curve with the help of experimental setup.

16.(a) Explain the construction and working of an SCR. Draw its V-I characteristics an explain.

(OR)

(b) Explain the construction and working of LDR. Draw its characteristics.

*****