Daffodil International University

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Final Examination, Fall 2020 @ DIU Blended Learning Center

Course Code: CSE224 (Day), Course Title: Electronics Devices and Circuits

Level: 2 Term: 2 Section: R1

Teacher: FR Modality: Open Book Exam

Date: Saturday, 19 December, 2020 Time: 06:30-10:30pm

Four hours (4:00Hrs) to support online open/case study based assessment Marks: 40

Directions:

- **Students need to go through the CASE STUDY shown in this exam paper.**
- **Analyze and answer specific section based on your own thinking and work.**
- **Do not share as this will be treated as plagiarism by Blended Learning Center.**
- **The pdf file name must be CSE224_Your Section_Your ID.**

Answer all the following three questions

Q1. If you go out in a sunny day to the bank of a village river, or the river flowing beside your town, or near the bank of Podda, Meghna, Jomuna; or if you go to Kuyakata or Coxbazar, you will see a common thing named sand. You all know that sand is a compound of Silicon and Oxygen. These two elements have a great uses in our daily life. We cannot live without Oxygen and many things we used in our daily life made by silicon. **8**

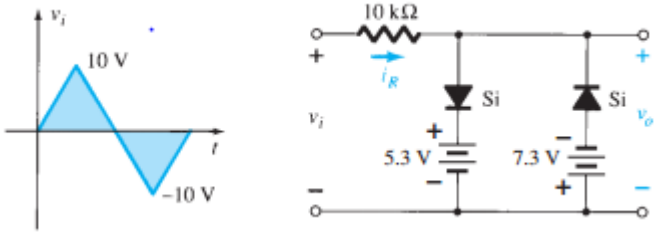
a. Write down the forbidden energy gaps of at least two materials.
b. Which elements are used to make extrinsic semiconductor in conjunction of these two materials?
c. If you join such two pieces of opposite impure semiconductors, what will be the potential barriers of them?
d. Draw the v-I characteristics of practical Si diode at forward and reverse bias

Q2. Now a day, most of the houses, varsities, offices, factories everywhere, we use dc power in various purposes. But the power from the Rangunia Thermal Power Station and the Kaptai Hydro Power Station have been generating ac, these power has been transmitting through the high voltage transmission lines of 400KV/230KV/132KV/66KV/33KV/11KV. Finally, DESA, DESCO, REB supply these power to the users. **16**

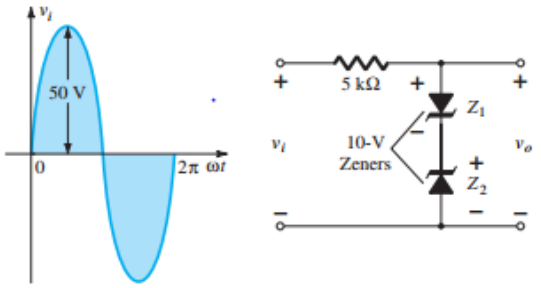
a. Describe the best circuits to produce pure dc which will be used for the charging of the batteries of a Daffodil/HP/Dell/Asus Laptop without any humming sound?
b. In data communication, the signal strength reduce greatly, with respect to distance, we have studied an electronics device, which is made by 3 pieces of impure semiconductors. Compare among the circuit connections of this device.
c. Why MOSFET is the best among all the transistors? Explain in Details.

d. Draw the output curve Vo

i.



ii.



Q3. **16**

a. All on a sudden, due to the fault in the generating plants, or transmission lines or distribution networks, or the load reduced greatly, the supply voltage increases and the maximum voltage across secondary becomes **45π** volts.

The diodes are ideal, the load of the best circuit used to generate pdc is 100Ω and the Transformer ratio is 5:1.

A sophisticated electronic equipment of 10KΩ load is connected with the best circuit and a 5KΩ protective series resistance, where Zener voltage is 50 volts.

I. What circuit will be helpful to protect your sophisticated electronic device? II. What may be the maximum efficiency of the best circuit?

III. What will be the currents through the Load of the sophisticated device?

b. We can connect the amplifier circuits in three ways; the most common one is used about 90 to 95 percent in practical applications. If the input base of this amplifier circuit is open, then also a small amount of currents found at the output.

I. Why the small amount of current flows at output though the input voltage source is open?

II. What are the values of current gain of this type of circuit?

III. Find the values of I_C using **α, β, γ.**

(In this circuit, the leakage current is 100μA, I_B= 100μA, β=100)

c. Find the value of I and V suppose the diodes are ideal