Daffodil International University
Department of Computer Science and Engineering
Faculty of Science and Information Technology
Mid Term Examination, Semester: Fall - 2019
Course Code: CSE 224   Course Title: Electronics Devices and Circuits
Section: All   Course Teacher: All

Time: 1:5 Hrs   Full Marks: 25

Answer any Four out of Five questions *(including question no Q5)*

Q1. **a.** Define forward and reverse biasing of pn junction.   1

     b. Describe the properties of semiconductor.   3

     c. Can you make crystal diode with n-type Germanium and indium? Describe the alloying method of making pn junction.   3

Q2. **a.** We have pulsating dc (pdc), what will be needed to make dc from this pdc?   1

     b. Show that the maximum efficiency of a center tap rectifier is double of half wave rectifier.   3

     c. Suppose you have ac supply of peak to peak voltage, V_{pp} = 400 v and a full wave bridge rectifier, find :(i) I_m, I_{dc}, I_{rms} (ii) ac power input and dc power output of the rectifier (assume internal resistance, r_f = 1Ω and load resistance R_L = 998Ω).   3

Q3. **a.** Find out the relationship between α and Y.   1

     b. Find the expression of collector current of CE connection of transistor.   3

     c. A common base transistor amplifier has an input resistance of 10 Ω and output resistance of 100 kΩ. The collector load is 1 kΩ. If a signal of 500 mV is applied between emitter and base, find the voltage amplification. Assume α to be nearly one.   3

Q4. **a.** Which one is better JFET or MOSFET? Why?   1

     b. If the supply voltage increase and load resistance decrease, how a Zener diode can stabilize the output voltage. Describe in details.   3

     c. Design a voltage stabilizer for varying load using a Zener diode of 8 V. The load current is to vary from 12 to 90 mA. Find the value of series resistance R to maintain a voltage of 8 V across the load. The input voltage is constant at 12V and the minimum Zener current is 10 mA.   3

Q5. **a.** When pentavalent impurity is added to a pure semiconductor, it is known as ……………………… and when trivalent impurity is added, it is called ………………………. semiconductor.   4x1= 4

     b. The Peak Inverse Voltage of full wave bridge and center tap rectifiers are ……………………… and ………………………. respectively.

     c. The practical values of base current amplification factor, β varies from …………… to ……………

     d. A bipolar junction transistor (*BJT*) is a ……………………… controlled device whereas a field effect transistor (*FET*) is a ………………………. controlled device.