1059

B.E. (Information Technology) Second Semester
EC-202: Introduction to Electronics

Max. Marks: 50

Time allowed: 3 Hours

NOTE: *Attempt* <u>*five*</u> *questions in all, including Question No. I which is compulsory and selecting two questions from each Part.*

x-x-x

1.(a) What is doping? An intrinsic sample of Si is to be converted to an n-type extrinsic material. Which are the possible elements you would dope? (2)

(b) Why does very small current flows through the p-n junction under reverse bias? (2)

(c) Define common mode rejection ratio (CMRR). How does it influence the gain of a differential amplifier? (2)

(d) What is difference between Latch and Flip-flop? (2)

(e) What is modulation index? (2)

Part- A

2. (a) Give qualitative analysis of a P-N junction as a diode and draw its V-I characteristics and explain its temperature dependence. (5)

(b) Differentiate between Intrinsic and Extrinsic semiconductors. (2)

(c) Discuss the evolution of Electronic devices and Integrated circuits in brief. (3)

3.(a) Determine output v_o from the circuit diagram shown below with respect to the input signal as indicated as v_i :

(5)
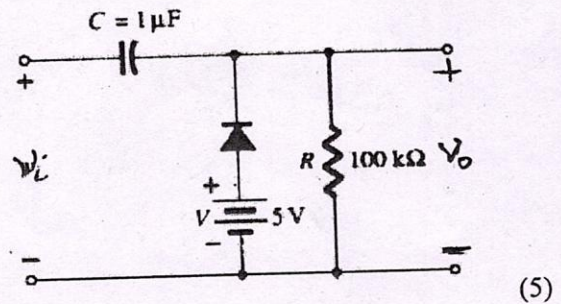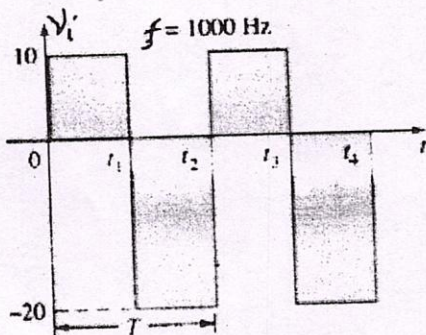
(b) Draw the circuit of transistor in the CE configuration, sketch the output characteristic & indicate active, saturation, & cutoff regions. (5)

4. (a) Perform following subtraction using 2's complement method. (2)
$$(11000)_2 - (11001)_2$$

(b) Convert the following nos.

(i) $(58)_{10} = ()_2$

(ii) $(476)_8 = ()_{16}$

(iii) $(5C5)_{16} = ()_{10}$ (3)

(c) Reduce the following Boolean expression with the help of a Karnaugh's map and show its implementation using two input NAD gates only.
$$F (a,b,c,d)= \sum m (2,3,8,10,11,12,14,15)$$ (5)

P.T.O.

Part-B

5.(a) What is race around condition? Describe its possible solutions. (5)

(b) What are synchronous counters? Design a decade synchronous counter. (5)

6.(a) A 5-bit DAC has a current output. For a digital input of 101000, an output current of 10mA is produced. What will I_{OUT} be for a digital input of 11101? (3)

(b) What do you know about quantization error? (2)

(b) What is OPAMP? Discuss the application of an OP-AMP as summing amplifier and difference amplifier. (5)

7.(a) Give the details of various frequency bands for communication. (3)

(b) What is modulation? (2)

(c) Give brief comparison of analog and digital communication systems. (5)

x-x-x