Seat No. : _____

TD-104

B.Sc. Sem.-IV
May-2013
204 Electronics

Time : 3 Hours]　　　　　　　　　　　　　　　　　　　　　　**[Max. Marks : 70**

Instructions :　(1)　**All** questions carry equal marks.

　　　　　　　　　(2)　Symbols used have their meanings as usual.

1.　(a)　With the help of neat and a clean diagram explain working of the RC phase shift Oscillator and derive equation for frequency of oscillation.　　**7**

OR

With the help of neat and a clean diagram explain working of the Hartley Oscillator and derive equation for frequency of oscillation.

　　(b)　Give switching times in a transistor with necessary output pulse wave form and define (i) time delay T_d (ii) rise time T_r (iii) turn on time T_{ON} (iv) storage time T_s (v) fall time T_f (vi) turn off time T_{OFF} and (vii) pulse width W.　　**7**

OR

Draw circuit diagram of an Astable mutlivibrator and explain its work.

2.　(a)　Show that a transformer coupled class A amplifier has maximum theoretical conversion efficiency of 50%.　　**7**

OR

What is required to provide push pull operation ? How is transformer saturation is avoided in this type of operation ? What other advantages does push pull amplifier provide ?

(b) Show that the maximum conversion efficiency of a pure class B push pull amplifier is 78.5%. **7**

OR

Show total power P_L'(from both transistors) deliverable to the output transformer in a class B amplifier is given by P_L'$=2P_{D,peak} = 5P_T$.

3. (a) Answer the following : **7**

   (i) List the advantages of the integrate (IC) over discrete component circuit.

   (ii) Classify ICs on the basis of applications.

OR

Explain how silicon wafers are produced.

(b) Explain importance of SiO_2 layer. How thick is this layer ? **7**

OR

Explain very briefly photolithography process.

4. (a) List six characteristics of an ideal op-amp. **7**

OR

With neat circuit diagram give analysis of op-amp inverting amplifier.

(b) Give DC characteristics of op-amp in brief and justify why input bias current is necessary to flow into the inputs of op-amp. How it can be reduced ? **7**

OR

Define Slew rate. What causes slew rate and how it is measured ? The output of an op-amp follower is a triangular wave as shown in following figure. For a square wave input of frequency 2MHz and 8V peak to peak amplitude. What is the slew rate of the op-amp ?

5.   Answer in short :   **14**
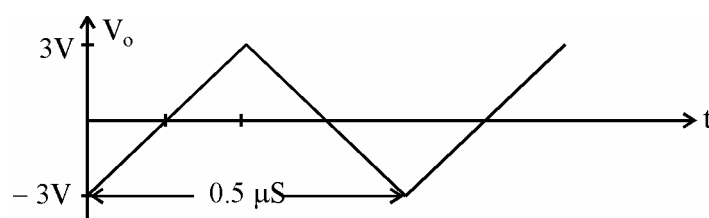
  (1)   How many stable states does a mono stable multivibrator have ?

  (2)   What is the width of output pulse of a monostable mutivibrator ?

  (3)   Which values does frequency of astable multivibrator depend mainly on ?

  (4)   Frequency stability of RC oscillators is higher or lower than LC oscillators ?

  (5)   Name the oscillator which has both positive and negative feedback.

  (6)   Name the oscillator which uses the inductive feedback.

  (7)   Why transformer is used in the output of the power amplifier ?

  (8)   Is it true to say that class A amplifier as compared to class B amplifier has less
        distortion ?

  (9)   Why class AB operation is used in power amplifier ?

  (10) What is input offset voltage ?

  (11) Give circuit symbol for op-amp.

  (12) What is the full form of SiO_2 ?

  (13) What are full forms of SSI and VLSI ?

  (14) Is this equation related with oxidation process ?

        $Si + 2H_2O = SiO_2 + 2H_2$

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