Seat No. : _____

AB-111

April-2019

B.Sc., Sem.-IV

CC-204 : Electronics

Time : 2:30 Hours] **[Max. Marks : 70**

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

(2) Symbols used here have their usual meanings.

1. A. (a) Draw neat and clean diagram of Colpitt's oscillator. Explain working of Colpiff's oscillator and obtain the expression for frequency of oscillation. **7**

(b) (1) A three section RC phase shift oscillator has R = 10 kΩ and C = 0.01 μF. What is frequency of oscillation ? **7**

(2) A wein bridge oscillator has R = 4.7 kΩ and frequency of oscillator is 1 kHz. Find the value of capacitor.

(3) A Hartley oscillator is designed with L_1 = 2 mH & L_2 = 20 μH and variable capacitor. Determine the range of capacitor value if the frequency of oscillation is between 950 kHz and 2050 kHz.

OR

(a) Give switching times in a transistor with necessary output pulse waveform and define :

(i) time delay

(ii) rise time

(iii) turn-on time

(iv) storage time

(v) fall time

(vi) turn-off time

(vii) pulse width

(b) Explain astable multi-vibrator and obtain the expression for frequency of oscillation with necessary diagram.

(B) Answer in brief : (any **four**) **4**

(1) Which oscillator use positive and negative feedback ?

(2) Frequency stability of RC oscillator is higher or lower than LC oscillator.

(3) Write condition of oscillation.

(4) Which type of multivibrator is used as digital memory device ?

(5) What is the width of output pulse of a monostable multivibrator ?

(6) How many stable states in monostable multivibrator ?

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

(b) Write distavantages of a single ended transformer coupled amplifier and explain output transformer saturation. **7**

OR

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

(b) Draw a circuit diagram of class B complementary symmetry amplifier and explain it.

(B) Answer in brief : (any **four**) **4**

(1) The maximum conversion efficiency in class A utilizing a direct coupled resistive load is _____.

(2) What do you mean by cross over distortion ?

(3) What is harmonic distortion ?

(4) What are the advantages does push pull provide ?

(5) How many active devices are used in a class A push pull amplifier ?

(6) Draw the circuit of transistor phase inverter to provide two singals 180° out of phase with each other.

3. (A) (a) Write basic steps for basic planner process. Explain silicon water preparation in detail. **7**

(b) Write the advantages of the integrated circuit (IC) over discrete component circuit and classify IC on the basis of application device used and chip complexity. **7**

OR

(a) Write different methods for fabricating integrated resistors. Explain thin film and pinched resistor.

(b) Discuss the various ways for fabricating pnp transistor.

(B) Answer in brief : (any **three**) **3**

(1) What do you mean by word Monolithic ?

(2) Write full form of VLSI.

(3) Why we used silicon nitride Si_3N_4 in fabrication of MOSFET ?

(4) Write the thickness of oxide layer.

(5) What is full form of SiO_2 ?

4. (A) (a) Draw the circuit of inverting amplifier using op-amp. Derive the equation for the voltage gain. Design an amplifier with gain of –10 and input resistance equal to 10 kΩ. **7**

(b) Write the characteristics of ideal Op-Amp and explain. **7**

OR

(a) Explain :

(i) Slew rate

(ii) Input offset voltage

(b) Draw the circuit of differential amplifier and explain it.

(B) Answer in brief : (any **three**) **3**

(1) Draw the pin diagram of Op-Amp IC 741.

(2) Name different types of IC package.

(3) What is DIP ?

(4) Draw the symbol of Op-Amp.

(5) Draw circuit of voltage follower using Op-Amp.