Scheme – G

Sample Question Paper

Course Name : Electronics Engineering Group

Course Code : EJ/EN/ET/EX/EV/IC/IE/IS/MU/DE/ED/ET/IU

Semester   : Third

17319

Subject Title : Electronics Devices and Circuits

Marks   : 100   **Time: 03 Hours**

Instructions:

1. All questions are compulsory.

2. Illustrate your answers with neat sketches wherever necessary.

3. Figures to the right indicate full marks.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

Q1. A) Attempt any SIX   **(12 Marks)**

a. List various transistor biasing methods.

b. Define stability factor.

c. State the need of cascade amplifier.

d. Draw symbol of FET and MOSFET.

e. Sketch series and parallel tuned circuits.

f. Define efficiency of power amplifier.

g. State the effect of V_{GS} on channel conductivity of n-channel JFET

h. Define intrinsic stand off ratio.

Q1. B) Attempt any TWO   **(08 Marks)**

a. Draw the output characteristics of Common Emitter configuration. Write the effect of collector voltage on the collator current with reference to the characteristics. What is the effect of base current I_B on collector current I_C with reference to characteristics?

b. Draw the circuit diagram of voltage divider biasing method of BJT. How stability in operating point is obtained?

c. Sketch pin diagram of IC 723. Give any four advantages of IC voltage regulator over discrete voltage regulators.

Q2. Attempt any FOUR   **(16 Marks)**

    a. What is thermal runaway in transistor? How it can be avoided?

    b. Draw the circuit diagram of fixed bias. Why it is called as fixed bias?

    c. Distinguish between FET and BJT on the basis of any four factors

    d. Draw transistor as switch. What is voltage across transistor and current through transistor when transistor is ON and OFF?

    e. Draw the block diagram of voltage shunt and voltage series feedback.

    f. State the advantages and disadvantages of transistorised series voltage regulator.

Q3. Attempt any FOUR   **(16 Marks)**

    a. Compare common base, common collector configuration of BJT with reference to following point.

                i. Input Impedance   ii. Current gain

                iii. Voltage gain   iv. Phase shift between input and output signal

    b. With help of neat circuit diagram explain the working of self bias method for FET

    c. Draw the circuit diagram of crystal oscillator. What type of crystal can be used? Give properties of crystal used in oscillator.

    d. Draw frequency response of DC amplifier. Why gain is falling at high frequency in multistage amplifiers?

    e. Draw the circuit diagram of shunt regulator using BJT. How it works?

    f. What is necessity of regulated power supply? Define Line and Load regulation with reference to regulator.

Q4. Attempt any FOUR   **(16 Marks)**

    a. With the help of neat diagram write construction of n-channel FET.

    b. Draw the circuit diagram of single stage common emitter amplifier. Give the function of each component.

    c. Explain the working of n-channel D-MOSFET

    d. Differentiate between class A and class AB amplifier on the following basis

        i. Collector current waveforms

        ii. Position of Q point on the Load Line

        iii. Distortion in output voltage

        iv. Efficiency

    e. Explain class B push pull amplifier with a neat circuit diagram.

f. Draw UJT as free running time base generator. Draw waveforms across Base1,Base2, and across Capacitor

Q5. Attempt any FOUR   **(16 Marks)**

a. Define α, β and γ with respect to transistor configuration. State the relation between α and β.

b. For and RC phase shift oscillator the component values are as follow, R=8.2KΩ, C= 0.01μF, R1=1.2KΩ and RF=39KΩ.

    i.   Determine whether we can get sustained oscillations.

    ii. What will be the frequency of oscillations

c. Draw transformer coupled class A power amplifier.

d. How FET can be used as an amplifier? Explain with neat sketch.

e. Draw and explain RC phase shift oscillator with circuit diagram.

f.   Draw the circuit diagram to get +12Vdc and -12Vdc using IC 7812 and IC 7912 along with rectifier.

Q6. Attempt any FOUR   **(16 Marks)**

a. Draw the circuit diagram of base bias with emitter feedback for BJT, Write its working.

b. Distinguish between series and shunt voltage regulators. (Any four factors)

c. State the effect of negative feedback on following parameters: Bandwidth, Noise, gain stability and Distortion.

d. Draw the circuit diagram double tuned voltage amplifier works and explain how its frequency response is better than that of a single tuned voltage amplifier.

e. A quartz crystal has following constants: L=0.06H, C1=0.01pF, C2=10pF & R=500Ω. Calculate the series and parallel resonant frequency.

f. Sketch a neat labeled VI characteristics of unijunction Transistor