

3. (a) Derive an expression for the overall gain of a voltage series-feedback amplifier. 10
- (b) An amplifier has an internal gain of 80; the harmonic distortion in the output is 12%. To reduce the distortion within a tolerable limit of 3%. Calculate the feedback factor in the amplifier. 10

### Section-B

4. Explain the working of crystal oscillator with a neat and clean circuit diagram. Discuss general form of oscillator. 20
5. (a) What is an oscillator ? How does it differ from an amplifier ? What are the essential parts of an Oscillator circuit ? 10
- (b) Draw the circuit diagram of Hartley Oscillator and briefly explain, how the oscillations are maintained in the oscillator. 10

### Section-C

6. (a) Differentiate between voltage and power amplifiers. Give the classification of power amplifier with their applications. 10
- (b) What do you mean by Push-pull amplifier ? Find out the efficiency for the same. 10

7. (a) What are the Practical characteristics of OPAMP? 10
- (b) Explain the following in context with practical Op-Amp: 10
- (i) CMMR (ii) Output Impedance
- (iii) Slew rate (iv) Input Impedance

### Section-D

8. Explain the working of op amp as :
- (a) Differentiator 5
- (b) Bridge Amplifier 5
- (c) Current to Voltage Converter 5
- (d) Scale Changer 5
9. Explain how op amp can be used as :
- (a) Anti-log Amplifier 7
- (b) Schmitt Trigger 7
- (c) Digital to Analog Conversion 6