

ELECTRONIC DEVICES, CIRCUITS AND APPLICATION-II

3K-DFSN-02

Time : 3 Hrs.

M.M. : 100

Note :—

1. Part 'A' may be attempted in first 6 pages of Answer Sheet.
भाग 'क' के सभी उत्तर, उत्तर-पुस्तिका के प्रथम छः पृष्ठों में ही करने हैं।
2. Part 'B' in rest of the Sheets of Answer Sheet.
भाग 'ख' के उत्तर, उत्तर-पुस्तिका के अगले शेष पृष्ठों में लिखिये।
3. Answers may be given in English or Hindi.
प्रश्नों के उत्तर अंग्रेजी अथवा हिन्दी में दीजिये।

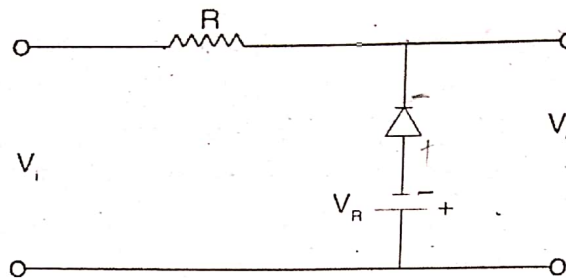
PART - A**1. Attempt any TEN questions :****(10 × 2 = 20)**

- (i) An ideal voltage amplifier has _____ input resistance and _____ output resistance.
- (ii) What do you mean by an electronic oscillator.
- (iii) What is the criteria for oscillation for a positive feedback amplifier.
- (iv) Give the basic principle of operation of a tuned collector oscillator.
- (v) Perform the binary subtraction $1101 - 111$.
- (vi) Explain the term Bit and Byte. What are the advantages of using (0,1) notation in the binary system.
- (vii) What is the logic symbol for an AND gate and OR gate ?
- (viii) Describe the use of an OPAMP as an Inverting amplifier.
- (ix) Explain transistor as a switch.
- (x) What are the advantages of using OP-AMP.
- (xi) "Feedback always increases the gain of an amplifier". True or false.
- (xii) Define the Half Power frequencies.
- (xiii) Plot the frequency response curve of RC coupled amplifier.
- (xiv) What do you mean by conversion efficiency of a power amplifier.

2. Attempt any FIVE questions :**(5 × 4 = 20)**

- (i) Obtain expressions for the voltage gain of an RC coupled amplifier in the low and high frequency ranges.
- (ii) Show that negative feedback improves the stability of the gain of an amplifier.
- (iii) Discuss the amplitude stability of the win bridge oscillator.

- (iv) What is the Barkhausen criterion? State the basic condition for oscillations in a feedback amplifier.
- (v) State the characteristics of an ideal OP-AMP. ✓
- (vi) Draw an emitter follower circuit and state its applications. ✓
- (vii) Draw the output voltage waveform for a given I/P sinusoidal voltage waveform. (assume diode to be ideal). ✓



- (viii) Give the logic symbol, Boolean expression, and truth table for an XOR gate. ✓

PART - B

Attempt any 3 questions :

(3 × 20 = 60)

3. (a) Design a two input XOR gate exclusively with the help of :
 (i) NAND gates
 (ii) NOR gates
- (b) Explain the working of an astable multivibrator.
4. (a) Give the circuit diagram of a Hartley oscillator and explain its operation.
 (b) Describe the working of a RC differentiating circuit.
5. An OP AMP unbuffered amplifier has an input resistance of $10\text{ K}\Omega$ and a feedback resistor of $50\text{ K}\Omega$. if the input voltage is 0.5 V , find the output voltage and the input current.
6. (a) What do you mean by conversion efficiency of a power amplifier? How does efficiency changes from class A to class C through class AB and class B?
 (b) Discuss the working of colpitts oscillator.
7. Write short notes on :
 (a) Piezoelectric crystal
 (b) Shunt Clipping Circuit
 (c) OPAMP as voltage follower
 (d) Difference between voltage and power Amplifiers