AT–338

B.Sc. (Part—II) Semester—III Examination

ELECTRONICS

(Electronics Devices and Circuits)

Time : Three Hours] [Maximum Marks : 80

Note :— (1) Question No. 1 is compulsory.

(2) Draw neat diagram wherever necessary.

1. (A) Fill in the blanks with correct word :

(i) An astable multivibrator is also known as _____.

(ii) The unit of input impedance is _____.

(iii) Bistable multivibrator has _____ stable state.

(iv) Voltage gain of emitter follower is nearly _____. 2

(B) Choose the correct alternatives :

(i) Cross over distortion occurs in _____ amplifier.

(a) Push pull

(b) Class A

(c) Class C

(d) Class AB

(ii) The negative feedback is always used in _____.

(a) Amplifier

(b) Oscillator

(c) Rectifier

(d) None

(iii) CMRR of an ideal diff. amplifier is _____.

(a) Zero

(b) Infinity

(c) Less than unity

(d) Greater than unity

(iv) The h-parameter of a h_{11} = _____.

(a) $\frac{I_1}{V_1}$

(b) $\frac{V_1}{I_1}$

(c) $\frac{V_1}{V_2}$

(d) $\frac{V_2}{V_1}$ 2

(C) Answer the following questions each in one sentence :

(i) What is A/D converter ?

(ii) What is cascaded amplifier ?

(iii) What is positive feedback ?

(iv) Define efficiency of power amplifier. 4

EITHER

2. (A) Define h-parameter of common emitter mode. 4

(B) Draw equivalent hybrid circuit for CE transistor amplifier. Derive the expression for :

(i) Current gain

(ii) Input impedance for a single stage CE transistor amplifier. 8

OR

(P) Explain construction and operation of two stage R-C coupled amplifier. 6

(Q) What is tuned amplifier ? Explain operation of single tuned amplifier with circuit diagram. 6

EITHER

3. (A) How amplifiers are classified on the basis of mode of operation ? 4

(B) Explain the construction and operation of two stage transformer coupled class A amplifier and derive expression for its efficiency. 8

OR

(P) Explain cross over distortion. How it is eliminated ? 4

(Q) What is class B push pull amplifier ? Explain construction and operation of complementary symmetry class B push pull amplifier. 8

EITHER

4. (A) What is oscillator ? Explain Barkhausen criterion of oscillations. 4

(B) Explain construction and operation of phase shift RC oscillator using transistor. State its advantages. 8

OR

(P) Draw the block diagram of feedback amplifier and obtain an expression for the voltage gain of an amplifier with negative feedback. 6

(Q) What are the different types of feedback ? Draw its block diagram. 6

EITHER

5. (A) Explain the operation of OP-AMP as subtractor. 6

(B) Explain with suitable diagram the working of OP-AMP as inverting amplifier. 6

OR

(P) Explain OP-AMP as differentiator and derive the expression for output voltage. 5

(Q) In inverting amplifier if Ri = 2 kΩ and Rf = 24 kΩ then calculate voltage gain and output voltage if input voltage is 1 V. 3

(R) Explain the terms :

(i) CMRR

(ii) Slew rate. 4

EITHER

6. (A) Explain how OP-AMP can be used as an astable multivibrator. Derive expression for the frequency of multivibrator. 6

(B) Explain the operation of OP-AMP as a logarithmic amplifier. 6

OR

(P) Show a possible computer set-up required for solving the following simultaneous equations $5x + 2y = 1$ and $3x - 6y - 2 = 0$. Write the necessary steps. 6

(Q) Explain construction and operation of monostable multivibrator using OP-AMP. 6

EITHER

7. (A) Explain the operation of single slope A/D converter. 6

(B) With suitable diagram, explain the operation of weighted resistor D/A converter. 6

OR

(P) Explain the terms :

(i) D/A Accuracy

(ii) D/A Resolution. 4

(Q) What is the principle of counter type A/D converter ? Explain the operation with suitable diagram. 8