

AP-456

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

3S : ELECTRONICS

(Electronics Devices and Circuits)

Time—Three Hours]

[Maximum Marks—80

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

(2) Draw neat diagrams wherever necessary.

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

- (i) The parameter h_{fe} stands for _____ in CE mode.
- (ii) The maximum efficiency of Class-B power amplifier is _____.
- (iii) When negative feedback is applied to the amplifier then its gain _____ ?
- (iv) The voltage gain of inverting Op-Amp is _____.
 $\frac{1}{2} \times 4 = 2$

(B) Choose the correct alternative and rewrite the answer :

(i) Hybrid means _____.

- (a) Mixed
- (b) Combination
- (c) Added
- (d) None

(ii) The output of differentiator is given by _____.

- (a) $-RC \frac{dv}{dt}$
- (b) $RC \frac{dvi}{dt}$
- (c) $\frac{1}{RC} \frac{dvi}{dt}$
- (d) $-\frac{1}{RC} \frac{dvi}{dt}$

OR

(p) What is Astable Multivibrator ? Explain construction and working of Op-Amp as astable multivibrator.

6

(q) Explain working of Op-Amp as logarithmic amplifier.

6

7. EITHER

(a) Explain the action of R-2R ladder type A/D converter.

6

(b) Explain the working of sample and hold circuit. 6

OR

(p) Draw block diagram of single slope A/D converter and explain its working.

6

(q) Describe the successive-approximation type A/D converter.

6

5. EITHER

(a) Explain working of Op-Amp as inverting amplifier.

4

(b) State the characteristics of ideal Op-Amp.

2

(c) Explain the terms :

(i) CMRR

(ii) Input offset voltage

(iii) Slew rate.

6

OR

(p) Explain the working of Op-Amp as subtractor.

5

(q) Explain the working of Op-Amp as differentiator.

4

(r) Explain the concept of virtual ground.

3

6. EITHER

(a) Explain how Op-Amp is used as damped harmonic oscillator; write necessary steps.

6

(b) Explain the working of Op-Amp as regenerative comparator.

6

UWO—45320

6

(Contd.)

(iii) The frequency of oscillation of Wein bridge oscillator is given by $f = \underline{\hspace{2cm}}$.

(a) $\frac{1}{2\pi RC}$

(b) $\frac{1}{2\pi\sqrt{LC}}$

(c) $\frac{1}{2\pi LC}$

(d) $\frac{1}{2\pi\sqrt{RC}}$

(iv) The regenerative comparator is also known as _____ multivibrator.

(a) Schmitt Trigger

(b) Monostable

(c) Astable

(d) None

 $\frac{1}{2} \times 4 = 2$

UWO—45320

3

(Contd.)

(C) Answer the following questions, each in **ONE** sentence only :

- (i) What is Class-B Power Amplifier ?
- (ii) What is Negative Feedback ?
- (iii) What is Closed Loop Gain ?
- (iv) What is D/A Convertor ? 4

2. **EITHER**

- (a) Draw circuit diagram of CE amplifier and obtain its hybrid equivalent circuit. 6
- (b) Derive expressions for output impedance and input impedance of CE amplifier in terms of h-parameters. 6

OR

- (p) Explain construction and working of single tuned amplifier. 6
- (q) What is Cascaded Amplifier ? Explain construction and working of R.C. coupled amplifier. 6

3. **EITHER**

- (a) What is Class-B Amplifier ? Show that efficiency of Class-B push-pull power amplifier is 78.5% . 6

- (b) Explain construction and working of complementary symmetry class B push pull amplifier. 6

OR

- (p) Explain construction and working of Class-B push-pull amplifier and state its disadvantages. 8
- (q) Explain Crossover Distortion. 4

4. **EITHER**

- (a) Explain the term feedback in amplifier. Derive an expression for output impedance of amplifier with negative feedback. 6
- (b) Explain the effect of negative feedback on distortion with necessary derivation. 4
- (c) State the difference between amplifier and oscillator. 2

OR

- (p) Explain construction and working of Colpitts oscillator. 6
- (q) Draw a circuit diagram of RC phase shift oscillator and explain its working. 6