AV–1749

## 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 :—                                    2
   (i) The oscillator uses _____ feedback.
   (ii) Input impedance of ideal OPAMP is _____.
   (iii) In ideal Op-AMP value of output impedance is _____.
   (iv) The conduction angle of Class B amplifier is _____ degree.

   (B) Choose correct alternative :—                                             2
   (i) Op-AMP IC741 has total _____ pins.
       (a) 2            (b) 6
       (c) 14          (d) 8
   (ii) The hfe is given by :
       (a) $\partial I_C / \partial I_B$         (b) $\partial I_B / \partial I_C$
       (c) $\partial V_{CE} / \partial I_C$      (d) $\partial V_{BE} / \partial V_{CE}$
   (iii) The regenerative comparator is also known as _____.
       (a) Schmitt trigger     (b) Monostable
       (c) Astable          (d) None
   (iv) Multistage amplifier are used in order to achieve _____.
       (a) Low Gain        (b) High Gain
       (c) Frequency response   (d) All of the above

   (C) Answer the following question each in one sentence only :—
   (i) What is feedback ?
   (ii) Define Bandwidth in case of RC coupled amplifier.
   (iii) Define power amplifier.
   (iv) What is A/D converter ?                                                  4

**EITHER**

2. (A) What is tuned amplifier ? Give its advantages.                            3
   (B) Draw circuit diagram of single tuned amplifier.                          3
   (C) Explain construction and operation of two stage R-C coupled amplifier with circuit diagram.
                                                                                6

**OR**

   (P) Explain the determination of h-parameter.                                4
   (Q) Draw hybrid equivalent circuit force transistor amplifier. Derive the expression for :
   (i) Input impedance
   (ii) Output impedance for a single stage CE transistor amplifier.            8

**EITHER**

3. (A) Give the classification of power amplifier. Explain. 4

(B) Explain construction and operation of Class B push pull amplifier. Derive the expression for its efficiency. 8

**OR**

(P) State the difference between Class A and Class B power amplifier. 4

(Q) Explain construction and working of transformer coupled Class A amplifier. Show the efficiency of transformer coupled resistive load Class A power amplifier is 50%. 8

**EITHER**

4. (A) State the difference between amplifier and oscillator. 3

(B) Deduce an equation for voltage gain of an amplifier using negative feedback. 6

(C) Amplifier's total harmonic distortion is reduced from 8% to 2% when 5% negative feedback is used. Calculate the voltage gain of the amplifier with and without feedback. 3

**OR**

(P) Explain the construction and working of Hartley oscillator. 6

(Q) Draw a circuit diagram of RC-Phase shift oscillator and explain its working. 6

**EITHER**

5. (A) Draw the block diagram of IC Op-Amp and explain the function of each block. 6

(B) Explain the working of Op-Amp as investing amplifier. Derive the expression for gain. 6

**OR**

(P) Explain the terms :—

(i) CMRR

(ii) Slew rate

(iii) Open loop gain 6

(Q) Explain the working of Op-Amp as integrator. 6

**EITHER**

6. (A) Explain the operation of Op-Amp as an astable multivibrator. 6

(B) Draw a possible computer set up required for solving following simultaneous equation $3x + y = 6$ and $2x + 5y = 7$. Write the necessary steps. 6

**OR**

(P) Draw the circuit of monostable multivibrator using Op-Amp. Explain its operation. 6

(Q) Explain how Op-Amp is used as harmonic oscillator. Write necessary steps. 6

**EITHER**

7. (A) Give the difference between A/D and D/A converter. 4

(B) Explain the principle and working of successive approximation type A/D converter with suitable daigram. 8

**OR**

(P) Explain the needs of ADC and DAC. 3

(Q) Explain the terms : –

(i) Accuracy

(ii) Resolution in D/A converter. 3

(R) Explain the construction and working of weighted resister D/A converter. 6