M.Sc. (First Year) Semester—II (CBCS Scheme) Examination

2-ELE-1 : ELECTRONICS

(Analog Circuit Design and Analysis)

Time : Three Hours] [Maximum Marks : 80

Note :—(1) All questions carry equal marks.

(2) Draw neat diagram wherever necessary.

(3) Due credit will be given to neatness.

1. (A) Draw the block diagram of Op-Amp and explain the operation of each block. 8

(B) Discuss the following parameters of Op-Amp :

(i) Input bias current

(ii) Input bias voltage

(iii) Slew rate

(iv) CMRR. 8

OR

(P) Draw the diagram of difference amplifier and explain its operation. Also explain Ac, Ad and CMRR. 8

(Q) Discuss the parameters of ideal Op-Amp. 8

2. (A) Draw the block diagram of amplifier with various feedback and explain the operation of voltage series feedback amplifier using Op-Amp. 8

(B) Explain the parameters in difference amplifier :

(i) Output Resistance

(ii) Bandwidth. 8

OR

(P) Explain the operation of voltage shunt feedback amplifier using Op-Amp. 8

(Q) What is effect of feedback in bandwidth of difference amplifier ? Explain in detail. 8

3. (A) Explain the frequency response of open loop voltage gain and closed loop voltage gain. 8

(B) Explain the use of Op-Amp as :

(i) Integrator

(ii) Differentiator. 8

OR

(P) Explain the use of Op-Amp as :

(i) Adder

(ii) Subtractor. 8

(Q) Explain the use of Op-Amp as :

(i) Current voltage convertor

(ii) Voltage to current convertor. 8

4. (A) Explain the following signal filters using Op-Amp :

   (i) Band pass filter

   (ii) Butterworth filter. 8

   (B) Explain the following circuit using Op-Amp :

   (i) Comparator

   (ii) Schmitt trigger. 8

OR

   (P) Explain the following convertor using Op-Amp :

   (i) Voltage to frequency

   (ii) Frequency to voltage. 8

   (Q) Explain the following convertors using Op-Amp :

   (i) A to D convertor (any one)

   (ii) D to A convertor (any one). 8

5. (A) Explain the use of 555 timer IC as :

   (i) Bistable multivibrator

   (ii) Astable multivibrator. 8

   (B) Draw the block diagram of 565 phase lock loop IC and explain the function of each block. State applications of 565 PLL. 8

OR

   (P) Draw the block diagram of 555 timer IC and explain the function of various blocks. 8

   (Q) Explain the operation of 565 PLL as :

   (i) Fixed voltage regulator

   (ii) Switching regulator. 8