

**NKT/KS/17/5156**

**Bachelor of Science (B.Sc.) Semester—IV (C.B.S.) Examination**

**ELECTRONICS (Analogue and Digital Techniques)**

**Paper—I**

Time : Three Hours]

[Maximum Marks : 50

**N.B. :—** (1) **ALL** questions are compulsory and carry equal marks.

(2) Draw neat diagrams whenever necessary.

**EITHER**

1. (a) What is feedback ? Explain positive and negative feedback. Give their applications. State and explain Barkhausen criterion for sustained oscillations. 1+2+2+5

**OR**

- (b) Explain the working of phase shift oscillator with circuit diagram.

In a phase shift oscillator, the three RC sections are made up of  $R = 1 \text{ k}\Omega$  and  $C = 0.1 \text{ }\mu\text{f}$ . Calculate the frequency of oscillation at the output. 6+4

**EITHER**

2. (a) Draw a neat diagram of OP AMP as Astable multivibrator and explain its working. Calculate the frequency of output of an astable multivibrator having  $R_1 = 35 \text{ k}\Omega$ ,  $R_2 = 30 \text{ k}\Omega$ ,  $R = 50 \text{ k}\Omega$ ,  $C = 0.01 \text{ }\mu\text{f}$ . 7+3

**OR**

- (b) Explain the concept and need for sample and hold circuit. Why is a CMOS switch used in it ? 7+3

**EITHER**

3. (a) Explain the working of binary weighted 4-bit DAC with suitable diagram. State any three parameters of DAC. 7+3

**OR**

- (b) Explain the working of R-2R ladder type DAC with suitable diagram.

For 4-bit R-2R ladder type DAC. Determine output voltage for input of 1101 (logic 0 corresponds to 0V and Logic 1 corresponds to 10V). 7+3

**EITHER**

4. (a) Draw the block diagram of Dual slope A/D converter and explain its working.

State the advantages of Dual slope ADC.

7+3

**OR**

- (b) Explain the working of flash type ADC with suitable diagram. State its advantages and disadvantages (any three).

7+3

5. Solve any **TEN** :

- (a) What is oscillator ?  
(b) Give the formula for frequency of oscillation in Wein Bridge oscillator.  
(c) What is stability in oscillator ?  
(d) What is Monostable multivibrator ?  
(e) State the use of instrumentation amplifier.  
(f) State the application of astable multivibrator.  
(g) Define settling time.  
(h) What is resolution ?  
(i) State any two applications of DAC.  
(j) What is the need of ADC ?  
(k) State two advantages of successive approximation type ADC.  
(l) State what is sampling theorem ?

1×10