

(3 Hours)

[Total Marks : 100

N.B. : (1) Question No. 1 is **compulsory**.(2) Answer any **four** questions for **remaining**.

(3) Assume suitable data wherever necessary.

(4) Draw neat circuit **diagram** wherever **necessary**.

- | | | |
|--------|--|----|
| 1. (a) | Explain current amplifier. | 5 |
| (b) | Explain switched capacitor filters. | 5 |
| (c) | Explain the log amplifier. | 5 |
| (d) | Find the output voltage expression for the averaging amplifier. | 5 |
| 2. (a) | Draw the block diagram of internal architecture of Xc 9500 family CPLD and explain. | 10 |
| (b) | Explain basic requirement of instrumentation amplifier and find output voltage expression for instrument amplifier using three op-amp. | 10 |
| 3. (a) | Design astable multivibrator using 555 with output frequency 10 KHz and duty cycle 70%. | 10 |
| (b) | Explain inverting schmitt trigger and find the expression for the hysteresis width for it also mention transfer characteristics. | 10 |
| 4. (a) | Design IC 566 for frequency 10 KHz. Find change in modulation voltage if frequency is varied from 9 KHz - 10 KHz. | 10 |
| (b) | Write the VHDL code for synchronous decade counter with rising clock edge and asynchronous clear input. | 10 |
| 5. (a) | Design a second order KRC highpass filter with cut-off frequency $f_0 = 1\text{KHz}$ and $Q = 5$ and draw circuit diagram. | 10 |
| (b) | Explain the servo tracking type ADC. | 5 |
| (c) | Explain the filter approximations. | 5 |

TURN OVER

6. (a) Explain IC 8038 with internal block. Find the expression for duty cycle of 8038 IC. **10**
- (b) Design a melay machine for overlap sequence detector for the string 1101. The output must be \perp when the input matches this string. **10**
- (i) Draw the state diagram
- (ii) Write its transition and output table.
- (iii) Draw its logic diagram.
7. (a) Explain antilog amplifier. **5**
- (b) Explain sample and hold CKT. **5**
- (c) Explain generalised impedance convertor. **5**
- (d) Differentiate between static RAM and Dynamic RAM. **5**
-