

DAY - 16

SEAT NUMBER

--	--	--	--	--	--

2020

III

11

1100

V - 233

(E)

**ELECTRONICS  
PAPER - I (C-2)**

**Time : 3 Hours**

**4 Pages**

**Max. Marks : 50**

- Instructions :** (1) All questions are compulsory.  
(2) Draw labeled diagrams wherever necessary.  
(3) Figures to the right indicates full marks.  
(4) Use of log table is allowed.

1. (A) Select correct alternatives and rewrite the sentences :

- (a) Transformer secondary voltage rating represents \_\_\_\_\_ value of voltage. 1
- (i) Peak  
(ii) Average  
(iii) Root mean Square  
(iv) Instantaneous
- (b) \_\_\_\_\_ is an active Transducer. 1
- (i) Light dependent resistor  
(ii) Thermistor  
(iii) Solar Cell  
(iv) Light Emitting Diode
- (c) In an optical fiber, propagation of light signal takes place due to \_\_\_\_\_ 1
- (i) Absorption  
(ii) Reflection  
(iii) Refraction  
(iv) Defraction

- (d) In IC-555 pin no. 3 is \_\_\_\_\_ terminal. 1
- (i) Output
  - (ii) Reset
  - (iii) Threshold
  - (iv) Discharge

(B) Answer any two of the following :

- ✓ (a) Explain the working of Half Wave Rectifier with capacitor input filter using its circuit diagram and waveform. 3
- ✓ (b) Explain with circuit diagram working of operational amplifier as buffer. 3
- ✓ (c) Draw internal block diagram of IC 555 and explain the function of each block. 3

2. (A) Answer any two of the following :

- (a) How CRO is used for frequency and phase measurement ? Explain it with suitable diagram. 3
- ✓ (b) Explain the following parameters in case of voltage regulators : 3
  - (i) Line Regulation
  - ✓ (ii) Load Regulation
  - (iii) Ripple Rejection
- ✓ (c) Draw voltage regulator circuit using IC LM317 and explain its working. Also state equation for its output voltage. 3

(B) Attempt any one of the following :

- (a) Explain the working of operational Amplifier schmitt trigger with the help of circuit diagram and transfer characteristics. 4
- (b) Compare AM with FM. (Any four points) 4

3. (A) Answer any two of the following :

- ✓ (a) Explain how CRO displays the waveform. 3
- ✓ (b) If centre tap full wave rectifier is connected across secondary of 12-0-12 volts of centre tap transformer. Whose primary is connected to AC mains supply of 230V, 50Hz then find out : 3
  - (i) Average Output Voltage
  - (ii) PIV Rating of Diode
- ✓ (c) Explain the working of Non Inverting Amplifier using operational amplifier. Derive the formula for its output voltage. 3

(B) Answer any one of the following :

- (a) What is Displacement Transducer ? Explain the working of linear variable differential transformer with its diagram. 4
- (b) (i) In amplitude modulation a sinusoidal carrier wave of frequency 2MHz, and amplitude 100V is modulated.
- (ii) Sinusoidal wave of frequency 10KHz producing 50% modulation, calculate (1) Amplitude of sidebands (2) frequencies of USB and LSB (3) Bandwidth. 4

4. (A) Answer any two of the following :

- (a) Explain any three front panel controls of CRO. 3
- (b) Explain the block diagram basic Idea of SMPS. 3
- (c) In an Inverting adder circuit using operational amplifier the input voltages are  $V_1 = 400\text{mV}$ ,  $V_2 = 200\text{mV}$  and  $V_3 = 100\text{mV}$ , if input resistance  $R_1 = 4\text{K}\Omega$ ,  $R_2 = 2\text{K}\Omega$  and  $R_3 = 1\text{K}\Omega$ . Find the output voltage for  $R_f = 10\text{K}\Omega$ . 3

(B) Answer any one of the following :

- (a) Explain the working of Inverting Amplifier using Op-Amp with neat diagram. How it can be used as a sign changer ? 4
- (b) What is Satellite ? Explain use of satellite as a Relay Station. 4

5. (A) Answer any two of the following :

- (a) Explain the function of Delay Line and blanking circuit in CRO. 3
- (b) In a Zener diode voltage Regulator circuit with series resistor of  $200\Omega$ . Find the Zener Current, Source Current and Load Current. If input voltage  $V_s$  is 20V, Breakdown voltage  $V_z$  is 15V and a load resistance is  $1\text{K}\Omega$ . 3
- (c) Draw basic block diagram of Communication System and explain it in brief. 3

(B) Answer any one of the following :

- (a) Explain the working of Thermistor and LDR with its constructional diagram. 4
- (b) State any four characteristics of an Ideal Operational Amplifier. 4

OR

5. (A) Answer **any two** of the following :
- (a) Draw the functional diagram of Electrostatic Focussing System and explain it in detail. 3
  - (b) Define the following terms in case of operational amplifier : 3
    - (i) Input Offset Current
    - (ii) Input Offset Voltage
    - (iii) Output Offset Voltage
  - (c) Explain the working of Astable Multivibrator using IC 555 with its circuit diagram. 3
- (B) Answer **any one** of the following :
- (a) Draw the block diagram of DC regulated power supply and explain the working of each block. 4
  - (b) What is Network Topology ? Explain Star, Ring and Bus Topology with suitable diagram. 4
-