

DAY - **16**

SEAT NUMBER

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2023

III

14

1100

V - 553

(E)

**ELECTRONICS
PAPER - I (C-2)****Time : 3 Hours****4 Pages****Max. Marks : 50**

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

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

(a) In CRT _____ anode has variable positive voltage. 1

- (i) Pre-accelerating
- (ii) Focussing
- (iii) Accelerating
- (iv) Control Grid

(b) The basic circuit of thermal shut down and current limiting is used in _____. 1

- (i) IC 741
- (ii) IC 317
- (iii) IC 555
- (iv) IC 556

(c) _____ is used as temperature transducer 1

- (i) LVDT
- (ii) LDR
- (iii) Thermistor
- (iv) Loudspeaker

- (d) Downlink frequency in satellite communication is _____ uplink frequency. 1
- smaller than
 - greater than
 - equal to
 - Smaller than or equal to

(B) Answer **any two** of the following :

- Explain any three characteristics of power supply. 3
- Explain how Op-Amp is used as buffer. Draw suitable circuit diagram. 3
- What is Amplitude Modulation ? Draw Waveforms. Explain importance of sidebands in Amplitude Modulation. 3

2. (A) Attempt **any two** of the following :

- Explain the use of CRO for frequency measurement and phase measurement using lissajous figures. 3
- Draw frequency response curve of an Operational Amplifier and explain. 3
- State six applications of Satellite Communication. 3

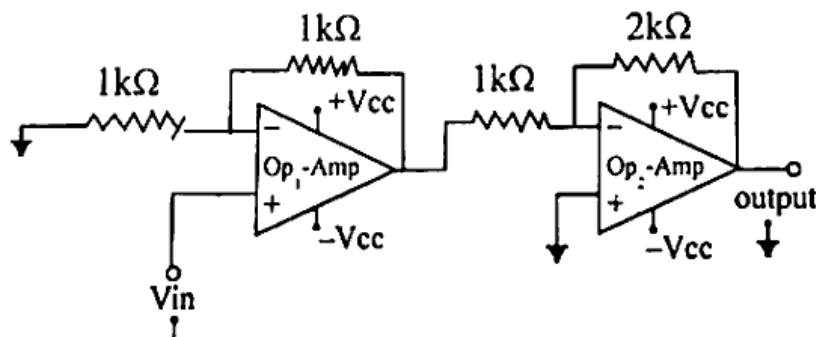
(B) Attempt **any one** of the following :

- Explain the working of voltage regulator using series pass transistor. 4
- Explain with circuit diagram the working of Op-Amp as a Schmitt Trigger. 4

Draw transfer characteristics. 4

3. (A) Attempt **any two** of the following :

- Explain the working of Capacitive Transducer. 3
- Calculate the output voltage for the given circuit diagram of $V_{in} = +2\text{V}$. 3



- Explain Star, Ring and Bus Topology with suitable diagrams. 3

(B) Attempt **any one** of the following :

- (a) Draw block diagram of Digital Multimeter and describe each block in brief. 4
- (b) Explain basic idea of switched mode power supply. State its two advantages. 4

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

- (a) Which factors should be considered while selecting transducer 3
 - (b) Define the following terms in frequency modulation :
 - (i) Frequency deviation
 - (ii) Carries swing
 - (iii) Modulation Index 3
 - (c) For IC-555 timer, connected in Astable Mode, calculate :
 - (i) Charging time <https://www.maharashtrastudy.com>
 - (ii) Discharging time
 - (iii) Output frequency 3
- Given $R_a = 10k\Omega$, $R_b = 12k\Omega$, $C = 0.1 \mu F$

(B) Answer **any one** of the following :

- (a) Draw and explain the circuit diagram of voltage regulator using Zener diode. Explain load regulation and line regulation. 4
- (b) Explain Non Inverting Op-Amp using circuit diagram. Derive expression for its gain. Calculate the gain if -
 $R_f = 5k\Omega$, $R_i = 1k\Omega$ 4

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

- (a) What are the advantages of digital multimeter over analog multimeter ? 3
- (b) Explain the following parameters of Op-Amp : 3
 - (i) Input offset voltage
 - (ii) Closed loop gain
 - (iii) Bandwidth
- (c) Explain IC 555 as a Monostable Multivibrator. 3

(B) Answer **any one** of the following :

- (a) Explain the working of centre tapped full wave rectifier with centre neat diagram. Draw waveforms. 4
- (b) Draw a block diagram of Fax Machine and explain its working. 4

OR

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

- (a) Write a note on (i) Thermistor (ii) LDR. 3
- (b) What is Modem ? Explain its use in Modern Communication. 3
- (c) Explain the use of IC 555 as FSK generator. 3

(B) Answer **any one** of the following :

- (a) Explain with neat block diagram the working of function generator. 4
- (b) Explain how Op-Amp can be used as Subtractor. 4

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