DAY - 17 SEAT NUMBER | | | | | | |

2025	III	04	1100	V – 53	(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 logtable is allowed.

1. (A) Select correct alternatives from the following sub-question and rewrite the complete sentences.

(a) In a full wave bridge rectifier the ripple frequency is _____. 1

(i) fin

(ii) 2 fin

(iii) 3 fin

(iv) 4 fin

(b) Loud Speaker is a _____ type of transducer. 1

(i) Pressure

(ii) Temperature

(iii) Electro acoustics

(iv) None of these

(c) In fax machines for scanning _____ are used. 1

(i) LEDs

(ii) LCDs

(iii) CCDs

(iv) None of these

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(d) _____ multivibrator is an oscillator. 1

(i) Astable

(ii) Bistable

(iii) Monostable

(iv) None of these

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

(a) Explain the working of centre-tap full wave rectifier with neat diagram and wave-form. 3

(b) Explain the following parameters of an operational amplifier : 3

(i) Input bias current

(ii) CMRR

(iii) Drift

(c) Calculate the output pulse width for the timer used as monostable multivibrator Given, R = 15KΩ and C = 0.22 μF. Find the value of C if pulse width changes to 20 ms. 3

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

(a) Draw labelled diagram of Cathode Ray Tube (CRT) and explain each electrode in it. 3

(b) Explain with the help of circuit diagram, working of Inductor input filter, when it is connected across the output terminals of a full-wave rectifier. Draw it's output wave-form. 3

(c) Draw block diagram IC 555. Explain function of each block. 3

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

(a) Draw a circuit diagram of an Inverting amplifier using Op-amplifier. Explain concept of virtual ground and hence derive the expression for it's output voltage. https://www.maharashtrastudy.com 4

(b) What is Amplitude Modulation ? State the expression for modulated wave and draw the waveform of modulated wave. 4

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

(a) With the help of Block diagram, explain the working of function Generator. 3

(b) Draw the circuit diagram of a voltage regulator using Zener diode, explain it's working. 3

(c) In an Op-Amp Inverting adder, V_1 = 0.2 volt, V_2 = 0.1 volt, V_3 = 0.4 volt, R_1 = 1 KΩ, R_2 = 2 KΩ, R_3 = 4 KΩ. Find the output voltage if feed back resistance in 20 KΩ. 3

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

(a) Explain the working of LVDT as a transducer. Draw neat diagram. State it's two applications. **4**

(b) What do you mean by Network Topology ? Explain Star, Ring and Bus Topology. **4**

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

(a) State any three front panel controls of CRO and give use of each control. **3**

(b) Explain with diagram and wave form working of R-C filter for reducing ripple. **3**

(c) Explain the working of differentiator circuit using operational amplifier. Derive expression for output voltage. **3**

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

(a) Draw basic circuit for Schmitt trigger using Op-Amp. and explain the terms :

(i) UTP

(ii) LTP

(iii) Hysteresis **4**

(b) Draw a block-diagram showing basic elements of a Fiber Optical Communication System. Explain function of each block in brief. **4**

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

(a) Explain electro-static focussing system of a CRT (Cathods Ray Tube). **3**

(b) In Full Wave Recitier, if primary of transformer is connected to 230V, 50 Hz and secondary voltage is 12-0-12V. **3**

Calculate :

(i) Output DC voltage

(ii) PIV of the diode

(iii) Output ripple frequency

(c) Give any three advantages of FM over AM.

(Frequency Modulation and Amplitude Modulation) **3**

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

(a) State Active Transducers. Explain Optocoupler. **4**

(b) How Op-amplifier can be used as a Subtractor ? **4**

OR

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

(a) Explain the use of CRO for measurement of phase. **3**

(b) Explain how Op-amplifier is used as a Buffer. Draw suitable circuit diagram. **3**

(c) Explain how IC 555 can be used as a Pulse Position Modulator (PPM). **3**

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

(a) Explain any four characteristics of a Power Supply. **4**

(b) Draw general block-diagram of a pulsed radar and explain function of each block in brief. **4**

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