



17302

11819

3 Hours / 100 Marks

Seat No.

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- Instructions :**
- (1) All questions are **compulsory**.
 - (2) Answer **each** next main question on a **new** page.
 - (3) Illustrate your answers with **neat** sketches **wherever** necessary.
 - (4) Figures to the **right** indicate **full** marks.
 - (5) Assume suitable data, if **necessary**.
 - (6) Mobile Phone, Pager and any other Electronic Communication devices are **not permissible** in Examination Hall.

Marks

1. a) Attempt **any six** : **12**
- i) Draw the symbol and label the terminals of
 - 1) LDR
 - 2) Photo-diode.
 - ii) Define Rectifier. List types of filters used in rectifiers.
 - iii) Define thermal runaway.
 - iv) Draw symbol of OPAMP and label all its terminals.
 - v) Draw logic symbol of 1 : 2 Demultiplexer. Write truth table also.
 - vi) Define transducer. Give its classification.
 - vii) Write four advantages of FMS (Flexible Manufacturing System).
 - viii) Define Mechatronics.
- b) Attempt **any two** : **8**
- i) Draw circuit diagram and I/P/O/P waveforms of full wave bridge rectifier.
 - ii) Draw circuit diagram for inverting amplifier. Calculate gain for inverting amplifier if $R_F = 21 \text{ k}\Omega$ and $R_1 = 3 \text{ k}\Omega$.
 - iii) Draw block diagram of CNC system and state function of each block.
2. Attempt **any four** : **16**
- a) List different biasing methods of BJT. Draw circuit diagram of voltage divider biasing method.
 - b) Draw the circuit and explain the working of transistor as a switch.
 - c) Draw circuit diagram of Non-inverting amplifier. Write its equation for gain.
 - d) Draw diagram of Bistable multivibrator using IC-555 and explain its working.
 - e) Compare RC and LC oscillator (4 points).
 - f) Draw logical circuit for full adder. Also write truth table.

P.T.O.



- 3. Attempt any four :** **16**
- Explain DC coupled amplifier with neat circuit diagram.
 - Draw symbol and write truth table of NAND and XOR gate.
 - Draw block diagram M/S JK Flip-Flop. Write its truth table.
 - Draw logical block diagram for 4 : 1 multiplexer along with its truth table.
 - State selection criteria for transducer (4 points).
 - Draw and explain functional block diagram of FMS.
- 4. Attempt any four :** **16**
- Write advantages of PLC (4 points). Write four applications of PLC.
 - Draw circuit diagram for single stage transistor amplifier. Also write requirements of multi-stage amplifier.
 - Draw block diagram of PLC and state function of each block.
 - State types of DAS. State its applications.
 - What is data logger ? Write its applications.
 - Compare intrinsic and extrinsic semiconductor.
- 5. Attempt any four :** **16**
- Define ADC and DAC. Write two applications of each.
 - With the help of suitable example state concept of active and passive transducer.
 - State two applications each of photo-diode and 7-segment display.
 - Write working of opto coupler as an isolator.
 - Compare microprocessor and microcontroller.
 - Draw symbol for 1) UJT 2) LED 3) FET 4) LDR.
- 6. Attempt any four :** **16**
- Define load regulation and line regulation.
 - Draw block diagram of regulated power supply. State the function of each block.
 - State Barkhausen criteria for oscillation. State types of oscillator.
 - State different triggering method. Draw symbol D-Flip Flop using positive edge triggering. Write its truth table.
 - Draw ladder diagram for 1) AND gate 2) NOR gate.
 - Draw internal schematic of decade counter. Also write its truth table.
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