313318

12526

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answer with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) Draw the symbol of zener diode and LED.

b) Define α and β of a transistor.

c) List types of rectifier.

d) Convert following:

$(25)_{10} = (\ ?\ )_2 = (\ ?\ )_{16}$.

e) Write specifications of IC 0808. (Any two points)

f) Draw symbol and write the truth table of D-flip-flop.

g) Write the base or Radix of following number system.

i) Binary

ii) Octal

iii) Decimal

iv) Hexadecimal.

Marks

2. Attempt any THREE of the following: **12**

a) Draw and explain V-1 characteristics of zener diode.

b) Describe the construction and working of NPN transistor with diagram.

c) Draw symbols and write truth table of NOT, AND, OR and NAND gate.

d) Explain the operation of SISO shift register with circuit diagram.

3. Attempt any THREE of the following: **12**

a) Draw the circuit of zener diode as a voltage regulator and explain its working.

b) Draw the circuit diagram of 4-bit R-2R ladder DAC and state its output voltage expression.

c) Compare CB, CE and CC configuration on the basis of –

i) Input impedance

ii) Output impedance

iii) Voltage gain

iv) Current gain.

d) Subtract using 2'S complement method :–

i) $(0101)_2 - 1001)_2$

ii) $(1110)_2 - (1001)_2$

4. Attempt any THREE of the following: **12**

a) With circuit diagram explain transistor as a switch.

b) Draw logic diagram of Half Adder and write its truth table.

c) Draw block diagram of DC regulated power supply. State the function of each block.

d) Draw and explain the working of single slope ADC.

e) State and prove Demorgan's first and second Theorem.

Marks

5. Attempt any TWO of the following: **12**

a) Compare half wave, centre tapped full wave and bridge type rectifier on the basis of :–

i) Number of diodes used

ii) Ripple factor

iii) Rectification efficiency

iv) Output dc voltage (Vdc)

v) Peak inverse voltage

vi) Transformer utilisation factor.

b) Draw and explain single stage RC coupled CE amplifier and state the function of each component.

c) Draw circuit diagram and output waveforms of 3-bit synchronous counter.

6. Attempt any TWO of the following: **12**

a) Describe successive approximation (SAR) Register ADC with diagram.

b) Draw and explain 8:1 multiplexer with truth table.

c) Draw input and output characteristics of CE configuration and show different regions on it.

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