| 2018 | III | 15 | 1100 | V – 433 | (E) |

ELECTRONICS
PAPER - I (C-2)

| Time : 3 Hours | 3 Pages | Max. Marks : 50 |

Instructions : (1) All questions are compulsory.

(2) Draw neat labelled diagrams wherever necessary.

(3) Figures to the right indicate full marks.

(4) Use of log table is allowed.

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

(a) The ripple factor of full wave rectifier is _____.   1

(i) 0.48

(ii) 1.21

(iii) 1

(iv) None of these

(b) _____ effect is used in LDR.   1

(i) Photovoltaic

(ii) Photoconductive

(iii) Photoemissive

(iv) None of these

(c) In IC 741, pin numbers _____ are used for offset null adjustment. 1

(i) 4 and 7

(ii) 1 and 5

(iii) 2 and 3

(iv) 4 and 8

(d) In FM, frequency of carrier wave is varied with _____ . 1

   (i) Amplitude of Modulating Signal

   (ii) Frequency of Modulating Signal

   (iii) Phase of Modulating Signal

   (iv) None of these

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

   (a) In a full wave rectifier centre tapped transformer is used. The secondary voltage is 50V ac. Using ideal diodes calculated the dc load voltage, current rating and PIV rating for the diodes. 3

     Given : $R_L = 47\Omega$

   (b) In inverting amplifier $R_i = 1\ K\Omega$ $R_f = 5\ K\Omega$. Calculate output voltage if input voltage is 50 mV. 3

   (c) Draw functional block diagram of IC 555 and explain. 3

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

   (a) With the help of a diagram explain electrostatic focussing in CRT. 3

   (b) Draw and explain functional block diagram of 3 terminal IC regulator. 3

   (c) Explain use of IC 555 as astable multivibrator. 3

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

   (a) Explain the following parameters of OP AMP :

     (i) CMRR

     (ii) Virtual Gound

     (iii) Open Loop Gain

     (iv) Closed Loop Gain 4

   (b) With the help of block diagram, explain the working of FAX transreceiver. 4

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

   (a) Explain how a CRO displays a waveform. 3

   (b) Draw and explain V-I. graph of Zener Diode. 3

   (c) Explain use of OP-AMP as a subtractor. 3

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

   (a) Explain the **working** of LVDT. State its uses.   4

   (b) Draw the block diagram of pulsed RADAR and explain function of each block.   4

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

   (a) Explain use of front panel control of CRO. **(Any Three)**   3

   (b) Draw and explain RC filter circuit. State its disadvantages.   3

   (c) Draw and explain OP-AMP as a non inverting amplifier.   3

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

   (a) Draw block diagram of OP-AMP and explain function of each block.   4

   (b) Compare FM with AM **(Any 8 points)**   4

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

   (a) The spot of a CRO is shifted by 4 cm when 10 volt dc is applied to its vertical input. Find maximum displacement of spot when 8V ac is applied.   3

   (b) Draw the block diagram of regulated power supply and briefly explain the function of each block.   3

   (c) Explain why modulation is necessary in communication.   3

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

   (a) Define Active and Passive Transducer. Explain the working of variable plate capacitive transducer.   4

   (b) Draw the circuit diagram of OP-AMP as Schmidt Trigger. With the help of waveforms explain how it converts sine wave to square wave.   4

OR

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

   (a) Draw block diagram of DMM and explain function of each block.   3

   (b) State any three advantages of differential amplifier over RC coupled amplifier.   3

   (c) Draw Pin diagram of IC 741 and state its applications.   3

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

   (a) Explain current limiting in a transistorised series regulator circuit.   4

   (b) Why networking is necessary in communication systems ? Explain WAN and MAN.   4

| 2018 | III | 17 | 1100 | V – 467 | (E) |

ELECTRONICS
PAPER - II (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 diagrams where necessary.*

(4) *Use of log tables is allowed.*

1. (A) Select the correct alternatives and rewrite the following sub-questions :

(a) When one of the input of two input Ex-OR Gate is high, it acts as a _____. 1

(i) NOT Gate

(ii) AND Gate

(iii) OR Gate

(iv) NAND Gate

(b) In tri-state logic, the third state is _____ state. 1

(i) low impedance

(ii) high impedance

(iii) low

(iv) high

(c) In J-K Flip-flop, when J=1 and K=1, if _____ when clock palse arrives. 1

(i) Sets

(ii) Resets

(iii) Toggles

(iv) Races

(d) In a counter type analog to digital converters _____ comparators comparator are/is used. **1**

    (i) one

    (ii) two

    (iii) three

    (iv) four

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

    (a) Convert the following : **3**

        (i) $(947)_{16} = (X)_{10}$

        (ii) $(111)_{10} = (X)_2$

        (iii) $(11011)_2 = (X)_{10}$

    (b) Explain working of Decimal to BCD encoder using OR gates with truth-table and a neat diagram. **3**

    (c) Hoe many Flip-flops are required to construct : **3**

        (i) MOD-15 Counter

        (ii) MOD-25 Counter

        (iii) MOD-8 Counter

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

    (a) Write a short note on : ASCII Code. **3**

    (b) Draw a neat logic diagram for given Boolean equation. Write its truth table. **3**

$$Y = (A + B) \cdot \overline{(A \cdot B)}$$

    (c) Explain in brief semiconductor memories used in computer. **3**

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

    (a) Explain operation of Decade counter with logic diagram, truth table and waveforms. **4**

    (b) Explain the working of weighted resistor type D/A converter with suitable diagram. State its advantages and disadvantages. **4**

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

   (a) Perform subtraction using is complement method of subtraction :   3

      (i) $(1011)_2 - (10001)_2$

      (ii) $(1011)_2 - (101)_2$

   (b) Explain the following terms for Digital ICs :   3

      (i)   Noise Margin

      (ii)   Fan Out

      (iii) Figure of Merit

   (c) What is a Multiplexer ? Explain 4 : 1 MUX with logic diagram and truth table.   3

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

   (a) Draw the block diagram of a computer and explain function of each block.   4

   (b) State and prove De Morgan's theorems.   4

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

   (a) Explain with suitable examples conversion of hexadecimal to decimal number system.   3

   (b) Explain how basic gates are constructed using NOR gates.   3

   (c) Explain the working of J-K Flip-flop with logic diagram and truthtable.   3

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

   (a) Implement the following multi-output.   4

      Combinational logic circuit using 4 line to 16 line decoder/Demux.

$$F_1 = \Sigma m \ (1, 3, 4, 6, 8, 10)$$

$$F_2 = \Sigma m \ (5, 8, 11, 14)$$

$$F_3 = \Sigma m \ (4, 8, 13)$$

   (b) Draw a block diagram and explain the working of simultaneous A/D converters. State its advantages and disadvantages.   4

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

   (a) What are Different Number Systems ? Define radix of a number system. Mention it for each of the number system.   3

   (b) Draw the circuit of TTL NAND gate and explain its working with truth table.   3

   (c) Implement the following logic expression using a Multiplexer IC :   3

   $$Y = \overline{A}\ \overline{B}\ \overline{C} + \overline{A}\ B\ \overline{C} + A\ \overline{B}\ \overline{C}\ ABC$$

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

   (a) Draw the diagram of 4-bit shift-left register using D Flip-flops and explain its working with waveforms.   4

   (b) Prove the following identities using Boolean laws only :   4

   (i) $(A + B)\ (A + C) = A + BC$

   (ii) $ABC + A\overline{B}C + AB\overline{C} = A\ (B + C)$

OR

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

   (a) Explain the working of CMOS NAND gate with a neat circuit diagram.   3

   (b) Explain the need of Multiplexing and Demultiplexing.   3

   (c) In a 4-bit R-2R ladder D/A converter find :   3

   (i) Full scale output voltage.

   (ii) Analog output voltage for 1011 input.

   (Given : Logic 'O' = OV and Logic '1' = +15V)

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

   (a) Explain the working of Up-down counter with logic diagram and truth table.   4

   (b) What is a Decoder ? Explain BCD to seven segment decoder/driver with neat logic diagram.   4