

DAY - 13

SEAT NUMBER

0 1 3 7 8 5

2016

III

11

1100

V - 33

(E)

ELECTRONICS PAPER - I (C-2)

Time : 3 Hours

4 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 from the following sub-questions and rewrite the complete sentences :

(a) The Uplink Frequency for a Satellite Transponder is always _____ Downlink Frequency.

- (i) Smaller than
- (ii) Equal to
- (iii) Greater than
- (iv) Smaller than or Equal to

(b) The OP-AMP used as differentiator gives an output _____.

(i) $V_o = -RC \frac{d_{vin}}{dt}$

(ii) $V_o = \frac{-1}{RC} \frac{d_{vin}}{dt}$

(iii) $V_o = RC \frac{d_{vin}}{dt}$

(iv) $V_o = \frac{1}{RC} \frac{d_{vin}}{dt}$

(c) The Filter Capacitor used with rectifier is usually _____ type. 1

- (i) Mica
- (ii) Ceramic
- (iii) Paper
- (iv) Electrolytic

(d) The Piezo-electric Transducer cannot measure _____. 1

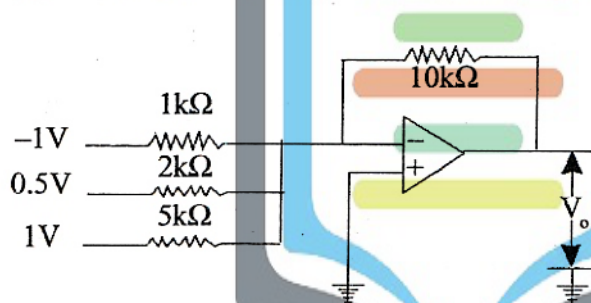
- (i) Static Phenomenon
- (ii) Dynamic Phenomenon
- (iii) Vibrations
- (iv) Acceleration

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

(a) Discuss any three front panel controls of the CRO. 3

(b) Draw and explain Opto-Coupler. 3

(c) Calculate the Output Voltage of the circuit shown in figure : 3



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

(a) Define Simplex and Duplex Type of Electronic Communication and write an example of each. 3

(b) Draw the block diagram of Regulated Power Supply and explain with Waveform at each stage. 3

(c) Explain the following terms with respect of OP-AMP : 3

- (i) Slew Rate
- (ii) CMRR
- (iii) Input bias Current

- (B) Attempt **any one** of the following :
- (a) In an AM modulated wave the instantaneous value of modulating signal is given by $V_m = 120 \sin 100\pi t$ Volt and that of carrier signal $V_c = 240 \sin 10^6 \pi t$ Volt. Find : 4
- (i) Sideband Amplitude
- (ii) Sideband Frequencies
- (iii) Channel Bandwidth
- (iv) Frequency Spectrum
- (b) State advantages of Fiber-Optic Cables over Conventional Cable S. (Any eight points) 4
3. (A) Attempt **any two** of the following :
- (a) Draw and explain working of PPM using IC 555. 3
- (b) Explain the use of OP-AMP as subtractor. 3
- (c) Give two examples of each : 3
- (i) Pressure Transducer
- (ii) Temperature Transducer
- (iii) Displacement Transducer
- (B) Attempt **any one** of the following :
- (a) Draw and explain the internal functional diagram of Three Terminal IC Regulator. 4
- (b) Draw and explain the internal block diagram of IC 555. 4
4. (A) Answer **any two** of the following :
- (a) Explain the Electrostatic Focussing System in CRT with the help of suitable diagram. 3
- (b) State any four Applications of Satellite and explain any one of them. 3
- (c) Mention the drawbacks of RC Coupled and Direct Coupled Amplifier. 3
- (B) Attempt **any one** of the following :
- (a) Draw and explain block diagram of DMM. 4
- (b) Explain use of OP-AMP as Comparator. 4
5. (A) Attempt **any two** of the following :
- (a) In a Zener Regulator, Zener Diode is rated as 10V, 1 watt. The unregulated voltage supplied is 50V. The load resistance varies from $1k\Omega$ to $5k\Omega$ and a series resistor of 400Ω is connected. Find minimum and maximum Zener Current. Also find the change in Zener Current. 3
- (b) Explain the concept of RADAR System. 3
- (c) Explain any one type of GAS Sensor. 3

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

- (a) Draw block diagram of OP-AMP and explain each block. 4
- (b) Explain the use of CRO in Frequency and Phase Measurement by Lissajous Figures. 4

OR

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

- (a) Draw the circuit of Full-Wave Rectifier with Inductor Filter and explain the action of Inductor Filter with Waveforms. 3
- (b) Calculate the value of Capacitor in a monostable multivibrator using IC555 from the following data :
 $R = 100 \text{ k}\Omega$ $T = 22 \text{ seconds}$ 3
- (c) Discuss the need of modulation in Communication. 3

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

- (a) Explain use of OP-AMP as Buffer and Sign Changer. 4
- (b) Explain the current limiting technique in series transistorised regulator. 4

EXAM SOLUTION

Complete solution for your exam needs

DAY - 14

SEAT NUMBER

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2016 III 14

1100

V - 67

(E)

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

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

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

(a) EBCDIC Code is a _____ bit code. 1

- (i) 7
- (ii) 4
- (iii) 8
- (iv) 256

(b) For _____ Gate when one of the input is high, output is low. 1

- (i) NAND
- (ii) NOR
- (iii) EX-OR
- (iv) OR

(c) In _____ counter each Flip-flop is triggered from the compliment side of the previous Flip-flop. 1

- (i) Asynchronous down
- (ii) Parallel down
- (iii) Up
- (iv) Ring

- (d) Average conversion time for N-bit counter type ADC is _____. 1
- (i) $\frac{1}{2} NT$
(ii) $(2^N - 1)T$
(iii) $(2^{N-1})T$
(iv) $N \cdot T$
- (B) Attempt any two of the following : 3
- (a) Convert the following : 3
- (i) $(2CAB)_{16} = (?)_2$
(ii) $(3287)_{10} = (?)_{BCD}$
(iii) $(10110110)_2 = (?)_{10}$
- (b) Subtract the following numbers by using Z's Complement Method : 3
- (i) $(10101)_2 - (1001)_2$
(ii) $(1110)_2 - (1101)_2$
- (c) Explain R-S Flip-flop by using NOR Gates. 3
- (A) Attempt any two of the following : 3
- (a) Define Ex-OR Gate. Draw its logic diagram using basic gates and explain. 3
- (b) Draw the logic diagram for given logic expression and simplify : 3
- $(A + B) + A$
- (c) Draw and explain operation of 3-bit Parallel Counter. 3
- (B) Attempt any one of the following : 4
- (a) Explain with suitable example. Double dabble method. 4
- (b) Explain binary subtraction by 2's Complement Method with suitable examples. 4
3. (A) Attempt any two of the following : 3
- (a) Explain the following characteristics of digital IC's : 3
- (i) Noise Margin
(ii) Propagation Delay
(iii) Figure of Merit
- (b) With the help of neat diagram, explain the working of TTL NAND Gate. 3
- (c) Implement the following logic expression using Multiplexer. 3
- $f(A, B, C, D) = \sum m (1, 3, 5, 7, 12, 14)$

- (B) Attempt **any one** of the following :
- State ~~and~~ prove De-Morgan's theorems. Draw logic diagram. 4
 - Why NAND Gate is called Universal Building Block ? Construct basic gates using NAND Gate. 4
4. (A) Attempt **any two** of the following :
- Draw logic diagram of 1 : 4 Demultiplexer and explain its working. 3
 - Explain the working of BCD to Decimal decoder. Write its truth table. 3
 - Explain the procedure of combinational logic design using Multiplexer and state its advantages. 3
- (B) Attempt **any one** of the following :
- Explain in brief :
 - MICR
 - Light Pen
 - Plotter
 - COM 4
 - Draw a neat labelled block diagram of Digital Computer. Explain the function of each block. 4
5. (A) Attempt **any two** of the following :
- Explain the working of right shift register using D Flip-flops. Draw the necessary waveforms : 3
 - What will be the output voltage of a 4-bit, R-2R ladder type DAC, corresponding to the binary inputs : (i) 1011, (ii) 0101
 Given : Logic 0 = 0V
 Logic 1 = 12V 3
 - Explain the working of master slave J-k Flip-flop. 3
- (B) Attempt **any one** of the following :
- Explain the concept of Tri-state logic with the help of neat diagram, explain the working of TSL Inverter. 4
 - State different types of ADC's, explain any one of them. 4

OR

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

(a) Explain the need of A/D and D/A Converters. Give two examples of each. 3

(b) Write a short note on Ring Counter. 3

(c) Explain working of decimal to BCD encoder using OR Gates. 3

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

(a) Explain the working of Decade Counter with the help of logic diagram, truth table and timing diagram. 4

(b) Implement the following multioutput combinational logic circuit using 1:16 demultiplexer. (with active high output) 4

$$F_1 = \sum m (3, 5, 8, 11, 14)$$

$$F_2 = \sum m (2, 4, 6, 10)$$

$$F_3 = \sum m (1, 7, 9, 12, 13)$$



EXAM SOLUTION

Complete solution for your exam needs