

2015	III	12	1100	V - 633	(E)
<p style="text-align: center;">ELECTRONICS PAPER - I (C-2)</p>					
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 wherever necessary.
 - (4) Use of log table is allowed.

(A) Select correct alternatives and rewrite the following :

(a) The current rating of diode in full wave rectifier circuit must be _____.

1

- (i) More than or equal to the load current
- (ii) Less than or equal to the load current
- (iii) Less than or equal to half of the load current
- (iv) More than or equal to half of the load current

(b) LVDT is _____ Transducer.

1

- (i) Resistive
- (ii) Capacitive
- (iii) Inductive
- (iv) Self-generating

(c) A LAN that uses central controller for multiple stations is the _____ Topology.

1

- (i) Ring
- (ii) Star
- (iii) Bus
- (iv) Tree

(d) The reference voltages of comparators in IC555 can be changed externally by applying voltages at _____.

1

(i) Pin 4

(ii) Pin 2

(iii) Pin 6

(iv) Pin 5

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

(a) Draw circuit diagram of Time Base Generator and explain its working with the help of Waveform.

3

(b) Write comparison between Electrostatic and Electromagnetic Deflection Systems used in CRT. (Any Three)

3

(c) State two advantages of Bridge Rectifier. Is there any application where the centre tapped full wave rectifier is preferred over a Bridge Rectifier ?

3

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

(a) Explain use of CRO to measure frequency by using :

3

(i) Internal Time Base

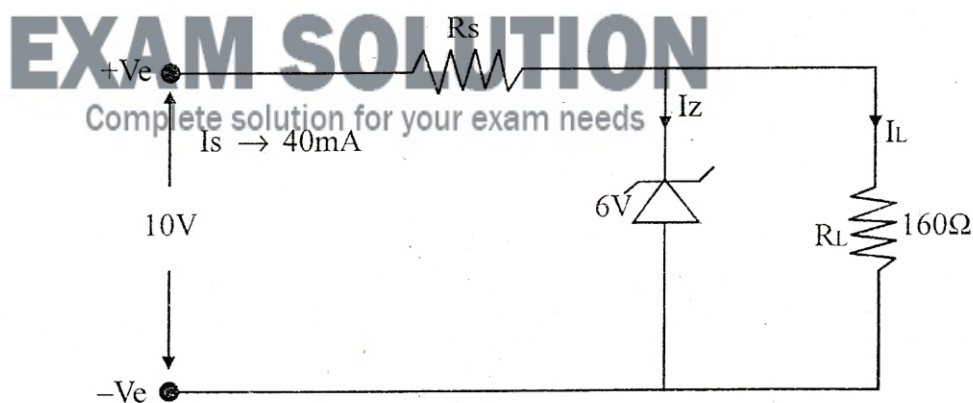
(ii) Lissajous Figures

(b) If two diode full wave rectifier is connected across secondary of 6-0-6 volts centre tapped transformer whose primary is connected to AC mains supply of 230V, 50Hz then,

(i) Find Average Output Voltage

(ii) Find PIV of the Diode

3



Calculate Values of R_s , I_L and I_z

3

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

Explain with circuit diagram how Operational Amplifier is used as Subtractor ? Derive an equation for its output voltage. 4

(b) Draw circuit diagram of Schmitts Trigger using OP-AMP with the help of transfer characteristics.

Explain :

(i) UTP Voltage

(ii) LTP Voltage 4

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

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

(b) Draw and explain RC Filter Circuit. State its two advantages. 3

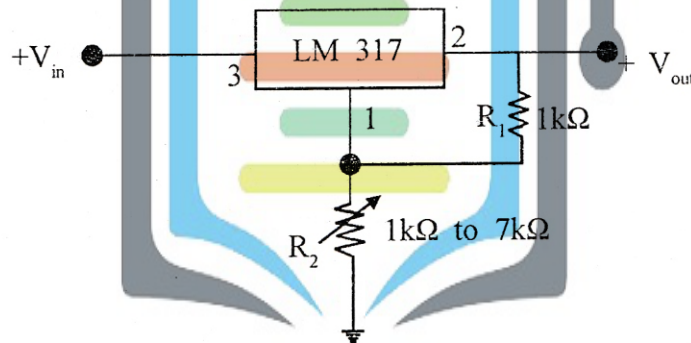
(c) State any six ideal characteristics of OP-AMP. 3

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

(a) Find values of R_A and R_B in a square wave generator using IC555, which generates a clock of frequency 1 MHz with duty cycle 70%.

(Given capacitor used in RC Network is of $0.01\mu\text{F}$) 4

(b)



Calculate range of output voltage in above circuit. 4

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

(a) Draw and explain OP-AMP as inverting amplifier. State how it can be used as sign changer ? 3

(b) In an OP-AMP adder :

$V_1 = 200 \text{ mV}$, $V_2 = 100 \text{ mV}$, $V_3 = 400 \text{ mV}$, $R_1 = 2 \text{ k}\Omega$, $R_2 = 1 \text{ k}\Omega$, $R_3 = 4 \text{ k}\Omega$.

Find output voltage if $R_F = 10 \text{ k}\Omega$. 3

(c) In OP-AMP integrator circuit, $R = 400 \text{ k}\Omega$, $C = 100 \mu\text{F}$ and DC Input Voltage = 10V. Find its output voltage after time of 5 seconds. 3

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

- (a) Draw a circuit diagram of transistorised series voltage regulator with simple current limiting network. Explain current limiting action. 4
- (b) Draw a block diagram of 3 pin IC Voltage Regulator and explain function of each block. State its advantages. (Any Two) 4

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

- (a) Draw a block diagram of Basic Communication System and explain it with a suitable example. 3
- (b) What is Bandwidth ? Explain its importance in limiting number of Channels. 3
- (c) Draw a neat labelled diagram of CRT of CRO. What is Aquadag Coating and explain its use. 3

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

- (a) Explain working of Zero Crossing Detector using OP-AMP as a Comparator. State disadvantage of Open Loop Comparator. 4
- (b) Explain working of Fibre Optic Communication System with the help of a block diagram. 4

OR

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

- (a) Explain working of Capacitive Transducer with the help of a neat diagram. 3
- (b) Draw a diagram of Moving Coil Type Loudspeaker and explain its operation. 3
- (c) Explain any three important factors for selection of a Transducer. 3

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

- (a) Draw a block diagram of FAX Machine and explain function of each block. 4
- (b) Explain principle of working of Pulsed and Continuous Wave Radar. 4

DAY - 14

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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 and labelled diagrams wherever necessary.
 - (4) Use of logarithmic tables is allowed.

1. (A) Select correct alternatives and rewrite complete sentences :

(a) Hex Equivalent of Binary Number 0.11 is _____.

1

(i) 0.3

(ii) 0.6

(iii) 0.C

(iv) 0.D

(b) $A \oplus A$ is equal to _____.

1

(i) 0

(ii) 1

(iii) A

(iv) A

(c) _____ is also called as Data Selector.

1

(i) Demultiplexer

(ii) Multiplexer

(iii) Encoder

(iv) Decoder

V-667]

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[P.T.O.]

- (d) Digitizer is _____ Device. 1
- (i) Output
- (ii) Memory
- (iii) Serial Entry Input
- ✓(iv) Direct Entry Input
- (B) Attempt **any two** of the following :
- ✓(a) Add and Subtract $(26)_{10}$ and $(32)_{10}$ after converting them into binary numbers. 3
- (b) Implement the following logical equation by using Multiplexer : 3
- $$Y = \overline{A}\overline{B}C + A\overline{B}C + \overline{A}B\overline{C} + ABC$$
- (c) With the help of neat diagram, explain working of J-K Flip-flop. 3
2. (A) Attempt **any two** of the following :
- (a) Explain working of EX-OR Gate as 4-bit Parity Checker. 3
- (b) Draw circuit diagram and explain working of Open Collector TTL NAND Gate. Give its advantages. 3
- ✓(c) Explain working of R-2R Ladder type DAC and find its output expression. 3
- (B) Attempt **any one** of the following :
- ✓(a) What is Encoder ? Explain working of Decimal to BCD Encoder by using 4-OR Gates. 4
- (b) Explain working of 4-bit Binary Ripple Counter with diagram, waveforms and truth table. 4
3. (A) Attempt **any two** of the following :
- (a) What do you mean by Code ? Write a note on BCD Code. 3
- ✓(b) Write a Boolean Equation, Truth Table and Symbol of a Basic Gate. 3
- ✓(c) Explain working of 1:4 Demultiplexer with the help of logic diagram. 3
- (B) Attempt **any one** of the following :
- ✓(a) Explain the following terms : 4
- (i) Clock
- (ii) Edge Triggering
- (iii) Toggle
- (iv) Racing

- (b) For a 4-bit Resistive Divider ($0 = 0V$ and $1 = +10V$), find : 4
- (i) Full Scale Output Voltage
 - (ii) The Output Voltage change due to LSB
 - (iii) Analog Output Voltage for Digital Input of 1010
4. (A) Attempt **any two** of the following :
- (a) What do you mean by CMOS Logic ? Explain operation of CMOS Inverter. 3
 - (b) With neat logic diagram explain working of Clocked D-Flip-flop. 3
 - (c) Explain working of Counter Type ADC. 3
- (B) Attempt **any one** of the following :
- (a) What is Full Adder ? Explain working of Full Adder by using Full Adder. 4
 - (b) What is Decoder ? Explain operation of BCD to 7-segment Decoder/Driver. 4
5. (A) Attempt **any two** of the following :
- (a) Convert the following : 3
 - (i) $(2A5.0A)_{16} = (---)_2$
 - (ii) $(1101110)_2 = (---)_{10}$
 - (iii) $(78.78)_{10} = (---)_{16}$
 - (b) What is Register ? Explain operation of Shift Right Register with timing diagram. 3
 - (c) What is Flash ADC ? Draw diagram of 3-bit Flash ADC and explain its operation. 3
- (B) Attempt **any one** of the following :
- (a) State and prove DeMorgan's Theorem with logic diagram. 4
 - (b) Explain different types of Semiconductor Memories. 4

OR

5. (A) Attempt **any two** of the following :
- (a) Explain the following characteristics of Digital IC's : 3
 - (i) Power Dissipation
 - (ii) Voltage Parameter
 - (iii) Operating Temperature

- (b) State any six specifications of PC. 3
- (c) Explain working of Ring Counter with timing diagram and truth table. 3
- (B) Attempt **any one** of the following :
- (a) Describe 1's Complement Method of Subtraction with two suitable examples. 4
- (b) What is Multiplexer ? Explain working of 4:1 Multiplexer. 4

