Time: 3 Hrs

Guessing Paper 2015-16
Subject: Applied Electronics – I, XII Electronics

Marks: 50

Ques 1 A] Fill in the blanks by choosing the *correct* alternative – **[4]**

a] In FWR, current in each diode flows for _____ of the input signal.

half cycle, full cycle, quarter cycle, none of these

b] The ____ pin of the timer IC 555, is known as reset pin.

pin-7, pin-1, pin-8, pin-4

c] Capacitive transducer is a _____ transducer.

Heat, light, displacement, gas

d] In _____ communication system, bidirectional communication is possible.

duplex system, baseband system, simplex system, triplex system

B] Attempt any **TWO** of the following: **[6]**

a] Explain how CRO can be used to measure the frequency using Lissajou's patterns.

b] Draw the block diagram of function generator and explain the various block functions in brief.

c] Define: slew rate, output offset and open loop gain for opamp.

Ques 2 A] Attempt any **TWO** of the following – **[6]**

a] State two advantages and one *disadvantage* of BR over FWR.

b] Explain simplex and duplex communication systems using one example each.

c] Explain using circuit diagram, the working of *any one* type of comparator using IC741 as opamp.

B] Attempt any **ONE** of the following – **[4]**

a] Explain the working of speaker transducer with neat diagram.

b] Explain the working of FWR with circuit. Draw input and output waveforms.

Ques 3 : A] Attempt any **TWO** of the following - **[6]**

a] How the opamp can be used as integrator? Derive output equation with circuit diagram.

b] Draw the block diagram of digital multimeter and explain its working.

c] Explain with the help of diagram working of LAN as star and ring networks.

B] Attempt any **ONE** of the following – **[4]**

a] Draw the block diagram of CRO, and explain the function of each block.

b] What is LVDT? Explain its working with block diagram.

Ques 4 A] Attempt any **TWO** of the following – **[6]**

a] Draw circuit diagram of two transistors regulator circuit and explain its working.

b] Explain piezo electric transducer in brief.

c] Draw circuit diagram of non-inverting amplifier and derive its output expression.

B] Attempt any **ONE** of the following – **[4]**

a] Derive the output equation of AM wave and draw its diagram.

b] Draw the block diagram of optical fiber communication system.

Ques 5 A] Attempt any **TWO** of the following – **[6]**

a] Define FM and give its properties with diagram.

b] Write a short note on capacitive transducer.

c] Explain the working of differential amplifier with diagram. What is CMRR?.

B] Attempt any **ONE** of the following – **[4]**

a] Draw the internal block diagram of opamp and explain the function of each block.

b] Design voltage regulator using IC LM 317 for Vo =10V, (if V_{ref} = 1.25V) and R_1 = 5kΩ.

OR

Ques 5 A] Attempt any **TWO** of the following – **[6]**

a] Draw the circuit of opamp as an adder and find Vo if V1 = 2mV, V2 = 5mV and V3 = 7mV, consider that R1 = R2.

b] Draw the block diagram of IC 555 and explain its working.

c] How capacitive filter circuit works? Explain with diagram.

B] Attempt any **ONE** of the following – **[4]**

a] What are the elements of communication system? Explain with diagram and example.

b] Define LR and SR for a DC power supply with an example of each.

Time: 3 Hrs

Guessing Paper 2015-16
Subject: Digital Electronics – II, XII Electronics

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Ques 1 : **A]** Select correct alternative and rewrite the sentence : **[4]**

a] The binary value of $(111100110111.101100000001)_2$ will be _____.

$(F37.B01)_{16}$, $(F37.110)_{16}$, $(E47.C01)_{16}$, $(101.B01)_{16}$

b] When any one input of Ex-OR gate is at logic-1, the circuit works as _____.

NOR gate, NAND gate, NOT gate, Ex-OR gate

c] The number of flip-flops required for MOD-30 counter will be _____.

Nine, five, seven, sixty-four

d] For constructing an OR gate using NOR gates, the number of NOR gates required will be _____.

2, 5, 3, 1

B] Attempt any **TWO** of the following – **[6]**

a] Explain the working of simultaneous type AD converter circuit using diagram.

b] What is encoder? Explain decimal to BCD encoder with necessary logic diagram.

c] Why NAND gate is called UBB? Explain how it can be used to construct basic gates.

Ques 2 A] Attempt any **TWO** of the following – **[6]**

a] Explain double-dabble method with any one example.

b] Draw the block diagram of basic computer and explain its three sections.

c] Convert the given numbers into binary: $(36.25)_{10}$, $(108.45)_{10}$, $(263.8)_{10}$

B] Attempt any **ONE** of the following – **[4]**

a] Draw the circuit of 4:1 line mux and explain its working with output equation and truth table.

b] In a circuit of 4–bit R–2R ladder find: (a) full scale output (b) for input 0110, if 0 = 0V and 1 = 16V.

Ques 3 : A] Attempt any **TWO** of the following – **[6]**

a] Mention the names of basic memories used in computer.

b] Draw the circuit of CMOS NOR gate and explain its working.

c] What is controlled inverter? Explain its working.

B] Attempt any **ONE** of the following – **[4]**

a] What is a demultiplexer? Design 1:4 Mux using gates and explain its working.

b] State and prove De Morgan's both theorems.

Ques 4: A] Attempt any **TWO** of the following – **[6]**

a] Draw the circuit of M/S flip-flop and explain its working.

b] Draw the circuit of 1:16 line demux with detailed labels.

c] Explain the working of right shift register using circuit diagram.

B] Attempt any **ONE** of the following – **[4]**

a] Draw the circuit of asynchronous counter and explain its working with wave diagrams.

b] Draw the circuit of full adder and explain its working.

Ques 5 A] Attempt any **TWO** of the following – **[6]**

a] Mention the classification of logic families.

b] What is encoder? Explain its working and draw its logic diagram also.

c] Define basic gates with circuit diagram and truth tables.

B] Attempt any **ONE** of the following – **[4]**

a] Define: fan out, figure of merit, power dissipation, propagation delay.

b] Discuss the working of 4–bit binary adder using circuit diagram.

OR

Ques 5 A] Attempt any **TWO** of the following – **[6]**

a] Explain the process of SAR with circuit diagram.

b] Subtract $(36)_{10}$, from $(43)_{10}$, using 2's complement method and obtain the answer in binary.

c] What is decoder? Explain its working with suitable diagram.

B] Attempt any **ONE** of the following - **[4]**

a] Compare TTL and CMOS logic circuits with any four points.

b] Prove the following identities –

1) $(\overline{A}+B+C).(A+\overline{B}+C).(A+B+\overline{C}) = AB + BC + AC + \overline{A}.\overline{B}.\overline{C}$

2) $(\overline{A}+B).(\overline{B}+C).(A+\overline{C}) = ABC + \overline{A}.\overline{B}.\overline{C}$

The End