Guessing Paper (2017 Exam)

Time: 3 Hrs | **Subject: Applied Electronics – I, XII Electronics** | **Marks: 50**

Ques 1: A) Fill in the blanks by choosing the *correct* alternative – **(4)**

a) If one diode in BR is open, the circuit still works as _____. **FWR, BR, Filter Circuit, HWR**

b) When _____ of IC 555 is grounded, it stops its working. **pin-7, pin-1, pin-8, pin-4**

c) _____ transducer is known as dual type of transducer. **thermister, LVDT, Piezo crystal, gas sensor**

d) The transmitter-receiver combination in satellite is known as _____. **walkie-talkie, GPS, SMT, transponder**

B) Attempt any **TWO** of the following: **(6)**

a) Define: input bias current, input offset voltage and frequency response for opamp.

b) Draw the block diagram of DMM and explain the function of various blocks, in brief.

c) Explain how CRO can be used to measure the phase using Lissajou's patterns.

Ques 2: A) Attempt any **TWO** of the following – **(6)**

a) Explain the working of FWR with circuit and waveforms.

b) What is fiber-optic communication? Explain with diagram.

c) Explain using circuit diagram, the working of comparator using IC741 as opamp.

B) Attempt any **ONE** of the following – **(4)**

a) Explain the working of LVDT with neat diagram.

b) Explain the working of capacitor filter circuit with circuit diagram.

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 and waveforms.

b) Draw the block diagram of a simple Function Generator and explain its working.

c) Explain with the help of *suitable diagram* principle working of cellular radio system.

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 thermister? Explain its working with Wheatstone bridge circuit.

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 loudspeaker as a transducer, with diagram.

c) Draw circuit diagram of subtractor and derive its output expression.

B) Attempt any **ONE** of the following – **(4)**

a) How satellite can be used as relay station? Explain the working of transponder with diagram.

b) Draw the block diagram of fax machine and explain its working in brief.

Ques 5 A) Attempt any **TWO** of the following – **(6)**

a) State *any six* merits of FM over AM.

b) Compare magnetic and electrostatic deflection systems used in CRO with diagrams and give its equation.

c) Explain working of LAN with any one example and diagram.

B) Attempt any **ONE** of the following – **(4)**

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

b) Explain in brief the basic concept of Pulsed RADAR.

OR

Ques 5 A) Attempt any **TWO** of the following – **(6)**

a) Draw opamp as adder and find Vo if V1 = 20mV, V2 = 45mV and V3 = 500µV, consider that R1 = R2.

b) Calculate the output frequency of IC555 as AMV, if R1=1kΩ, R2= 470kΩ and C = 1.2nF.

c) Explain any three characteristics of a DC power supply.

B) Attempt any **ONE** of the following – **(4)**

a) Design voltage regulator using IC LM 340 for Vo =12V, (if V_{ref} = 1.25V) and R_1 = 2kΩ.

b) Draw block diagram of 3-terminal voltage regulator IC LM317 and explain its working.

Guessing Paper (2017 Exam)

Time: 3 Hrs | **Subject: Digital Electronics – II, XII Electronics** | Marks: 50

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 acts as _____.

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

c) The number of flip-flops required for MOD-117 counter will be _____.

Nine, five, seven, sixty-four

d) Total number of resistors required in a n–bit weighted resistor network is given by _____.

2^n, $1–2^n$, $2^{n–1}$, $2^n–1$

B) Attempt any **TWO** of the following – **(6)**

a) Explain the working of counter type A/D converter circuit using diagram. Consider 4-bit output.

b) What is decoder? Explain decimal to BCD decoder using IC 7446/7447 with diagram.

c) Why NOR 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 hex-dabble method with any one example.

b) What is the memory in computer? State the different types of memory devices used in computer.

c) Convert the given numbers into binary: $(23.8)_{10}$, $(95.30)_{10}$, $(124.1)_{10}$

B) Attempt any **ONE** of the following – **(4)**

a) In a circuit of 4–bit R–2R ladder find: (a) full scale output (b) for input 1101, if 0 = 0V and 1 = 16V.

b) Design 8:1 multiplexer using two 4:1 multiplexer circuits and explain its working with diagram table.

Ques 3: A) Attempt any **TWO** of the following – **(6)**

a) Mention various types of volatile memories.

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

c) How controlled inverter circuit works using Ex-OR gates? Draw its circuit and explain the working.

B) Attempt any **ONE** of the following – **(4)**

a) What is a demultiplexer? Design 1:4 Demux 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 16:1 line mux with detailed labels.

c) What is a shift register? Explain any one type of register, with circuit diagram.

B) Attempt any **ONE** of the following – **(4)**

a) Draw the circuit of 3-bit, asynchronous counter and explain its working with wave diagrams.

b) Draw the diagram of encoder using IC 7447 and explain its working.

Ques 5: A) Attempt any **TWO** of the following – **(6)**

a) Mention the classification of logic families.

b) What is Mux? Draw the circuit of 4:1 Mux using switch and explain it. Draw its logic diagram also.

c) Draw the circuit of controlled inverter and explain its working. How it is useful in adder/subtractor circuit?

B) Attempt any **ONE** of the following – **(4)**

a) Define: power dissipation, figure of merit, fan out, 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 successive approximation method, with circuit and the necessary steps.

b) Using 2's complement method, explain the process of subtraction of any two binary numbers with an example.

c) Draw the block diagram of computer and explain it in brief.

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