18ELP02

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2019
(First Semester)

Branch - APPLIED ELECTRONICS

ANALOG & DIGITAL CIRCUIT DESIGN

Time : Three Hours Maximum : 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 x 1 = 10)

1 Which one of the following factor is responsible for the gain of the op-amp to fall after a specific frequency is reached?
(i) Capacitive effect (ii) Decreased Resistance
(iii) Inductive effect (iv) Increased Resistance

2 What is the need for level shifter in operational amplifier?
(i) Level the quiescent voltage (ii) Remove distortion at output
(iii) Limits the output voltage (iv) Increase the quiescent voltage

3 The Narrow band-pass filters are defined as
(i) Q<10 (ii) Q = 10 (iii) Q > 10 (iv) Q < 10

4 Which one of the following describes the function of a Differentiation amplifier?
(i) Output waveform as integration of input waveform
(ii) Input waveform as integration of output waveform
(iii) Output waveform as derivative of input waveform
(iv) Input waveform as derivative of output waveform

5 In an oscillator what will happen if |A(3| <1?
(i) Oscillation will diminish (ii) Oscillation will increase
(iii) Oscillation will remain constant (iv) Oscillation will fluctuate

6 Why the Zener diode is used at the output terminal of a square wave generator?
(i) To reduce both output and capacitor voltage swing
(ii) To reduce output voltage swing
(iii) To reduce input voltage swing
(iv) To reduce capacitor voltage swing

7 How many outputs, a decoder could produce with a 6 bit binary input?
(i) 32 (ii) 64 (iii) 128 (iv) 16

8 Which one of the following logic gate is a basic comparator?
(i) XOR " " (ii) XNOR
(iii) AND (iv) NAND

9 Which one of the following counter operates at high speed?
(i) Ring counter (ii) Ripple counter
(iii) Synchronous counter (iv) Asynchronous counter

10 In a 4-bit ripple counter, the flip-flop have a propagation delay of 15ns. Calculate the amount of time required for the counter to recycle from 1111 to 0000.
(i) 15 ns (ii) 30 ns

SECTION - B (35 Marks)

Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 7 = 35)

11 a Explain the AC characteristics of an Operational Amplifier.

OR

b Discuss about the characteristics of an ideal Op Amp.

12 a Show the operation of a PLL using block diagram.

OR

b Evaluate the operation of a low-dropout regulator and state its advantages over conventional regulators.

13 a Sketch the circuit diagram of a Square wave generator and discuss about the operation.

OR

b Analyze the operation of a Schmitt trigger with diagram.

14 a Explain the operation of a Magnitude comparator.

OR

b Analyze the operation of a full adder using its truth table.

15 a Distinguish between Moore and Mealy machine using block diagram.

OR

b Illustrate the advantages of state diagrams and state tables in combinational and sequential circuit design.

SECTION - C (30 Marks)

Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks (3 x 1 0 = 30)

16 Analyze the functions of an operational Amplifier using its internal circuit diagram.

17 Evaluate the functions of Integrators and Differentiator with neat diagrams.

18 Design a Sine wave generator using Operational Amplifier and explain the operation.

19 Construct a circuit for 1 line to 8 line Demultiplexer and interpret the operation.

20 Design a synchronous Decade counter using state diagram and state tables.

Z-Z-Z END