18ELP02

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2018
(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 To improve the CMRR value_____
(i) Increase common mode gain (ii) Decrease common mode gain
(iii) Increase Differential mode gain (iv) Decrease differential mode gain

2 The slew rate is represented by_____ .
(i) 1 V/ms (ii) 1 V/s
(iii) 1 V / *n* s (iv) 1 mv /S

3 Which one of the following is the output voltage of the log-amplifier?
(i) V_0 = -(kT) x In (Vi / Vref) (ii) V_0 = - (kT/q) x In (Vi / Vref)
(iii) V_0 = -(kT/q) x In (Vref / Vi) (iv) V_0 = (kT / q) x In (Vi / Vref)

4 The perfect integration is achieved in op-amp when_____ .
(i) Infinite gain (ii) Low input impendence
(iii) Low output impendence (iv) High CMRR

5 Depending on the value of input and reference voltage a comparator can be named as
(i) Voltage follower (ii) Digital to analog converter
(iii) Schmitt trigger (iv) Voltage level detector

6 Which one of the following is Barkhausen criterion for oscillation?
(i) *Aj3* >1 (ii) A *J3<1*
(iii) A *fl*=\ (iv) A *ft* * 1

7 The number of select lines is required from an 8-line-to-l line multiplexer is
W~2 00 3
(iii) 4 (iv) 8

8 In l-to-4 multiplexer, if Cl = 1 & C2 — 1, then the output will be_____ .
(i) Y_0 (ii) Y,
(iii) Y_2 (iv) Y_3

9 Which one of the following counters are used to count and display pulse in decimal form?
(i) Synchronous (ii) Shift
(iii) Ring (iv) BCD

10 What is a state diagram?
(i) It provides the graphical representation of states
(ii) It provides exactly the same information as the state table
(iii) It is same as the truth table (iv) It is a flowchart

Cont...

SECTION - B (35 Marksl
Answer ALL Questions
ALL Questions Carry EQUAL Marks (5 x 7 = 35)

11 a State the DC characteristics of an Operational Amplifier.

OR

b Sketch the internal circuit diagram of an Operational Amplifier.

12 a Discuss about the operations of Adder and Subtracter.

OR

b Evaluate the functions of Log and Anti log Amplifiers.

13 a Illustrate the operations of a Regenerative Comparator with circuit diagram.

OR

b Show the functions of a Triangular wave generator with neat diagram.

14 a Sketch the circuit diagram of a full subtractor and discuss about the operation with truth table.

OR

b Analyze the functions of a Binary Decoder.

15 a Discuss about the rules of State tables reduction.

OR

b Show the method of modeling a logic circuit using Moore machine

SECTION - C **(30 Marks)**
Answer any THREE Questions
ALL Questions Carry EQUAL Marks (3 x 10 = 30)

16 Analyze the characteristics of an Ideal Operational Amplifier.

17 Construct first order Low pass and High pass filters and discuss about their frequency characteristics.

18 Assess the operation of a Sawtooth wave generator using neat circuit diagram.

19 Construct an 8 line to 1 line Multiplexer using logic gates and mention its advantages.

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

Z-Z-Z END