PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
MSc DEGREE EXAMINATION DECEMBER 2022
(First Semester)

Branch – APPLIED ELECTRONICS

ANALOG & DIGITAL CIRCUIT DESIGN

Time: Three Hours   Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks   (5 x 1 = 5)

1   The CMRR for an operational amplifier should be -------
     (i) Equal to zero   (ii) Equal to unity
     (iii) As large as possible   (iv) Equal to 0.5

2   Which of the following is an operational amplifier?
     (i) IC 8085   (ii) IC 555
     (iii) IC 741   (iv) IC 7805

3   The op-amp used in Schmitt trigger is basically -----------
     (i) A pulse generator   (ii) A triangular wave generator
     (iii) Comparator with negative feedback (iv) Comparator with positive feedback

4   If we record any music in any recorder, such type of the process is called ------
     (i) Multiplexer   (ii) Demultiplexer
     (iii) Encoder   (iv) Decoder

5   To construct a 4-bit UP/DOWN counter, how many flip flops are required?
     (i) 4   (ii) 3
     (iii) 2   (iv) 5

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL questions carry **EQUAL** marks   (5 x 3 = 15)

6   a   What is meant by input bias current? How it is calculated?
               OR
   b   Define thermal drift.

7   a   Explain the operation of an op-amp based scaling amplifier.
               OR
   b   Write a short note on active filters.

8   a   Define the operation of a positive clipper.
               OR
   b   What is a DC clamper?

9   a   State the salient features of a combinational logic circuits.
               OR
   b   Define the operation of a multiplexer.

10   a   Write a short note on Moore machine.
               OR
   b   How a synchronous counter differs from a non-synchronous counter?

SECTION -C (30 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks   (5 x 6 = 30)

11 a   State and explain the ideal characteristics of an operational amplifier.
OR
   b   Explain the virtual ground concept of an op-amp.

12 a   Explain the operation of an instrumentation amplifier with help of a circuit diagram.
OR
   b   Explain the working principle of switching regulators in detail.

13 a   Describe the operation of a basic comparator with the help of a diagram.
OR
   b   How a sawtooth waveform can be generated with the help of op-amp?

14 a   Write a note on parity generators and checkers and their applications.
OR
   b   Explain the operation of a magnitude comparator.

15 a   State the various procedures to be followed while designing a sequential logic circuit.
OR
   b   Describe the operation of up/down counter.

Z-Z-Z   END