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Reg. No.....

Name.....

M.Sc. (BIOMEDICAL INSTRUMENTATION) DEGREE EXAMINATION SEPTEMBER 2023

Second Semester

DIGITAL ELECTRONICS AND INTEGRATED CIRCUITS

(2016 Admission onwards–Regular/Supplementary/Mercy Chance)

Time : Three Hours Maximum Marks : 100

Part A

Answer any **five** *questions.*
Each question carries 10 *marks.*

1. What is the basic concept of *k*-map ? Explain with an example Boolean function minimization using K-map.
2. Explain with a neat diagram the working of a serial adder circuit.
3. What is a shift-register counter ? Explain with diagram the working of any one shift register counter.
4. Discuss on the specifications of a basic TTL gate. Also explain its characteristics.
5. Draw and explain the internal block diagram of an Op-amp.
6. Explain with an example the Butterworth approximation method of filter design.

(5 × 10 = 50)

Part B

Answer any **ten** *questions.*
Each question carries 5 *marks.*

1. Explain the specific applications of binary, octal and Hexa-decimal number systems.
2. Explain the theorems in Boolean algebra.
3. Draw and explain the circuit of an up-down counter.
4. Discuss on the noise considerations in logic families.
5. Explain the concept of virtual ground.
6. Draw and explain a log-amplifier using Op-amps.
7. Explain with neat diagrams the working of a zero-crossing detector. What are its applications ?
8. Explain the principle of weighted R-2R DAC circuit.
9. Discuss on the transfer functions of LP, BP and all-pass filters.
10. Draw and explain the circuit of a voltage controlled oscillator.
11. Draw and explain a clamper circuit using Op-amps.
12. Draw and explain the working of an ADC circuit.

(10 × 5 = 50)