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Reg. No................................

Name...................................

M.Sc. (BIOMEDICAL INSTRUMENTATION) DEGREE EXAMINATION AUGUST 2025

Second Semester

BMI 202—DIGITAL ELECTRONICS AND INTEGRATED CIRCUITS

(2024 Admissions—Regular/2021—2023 Admissions—Supplementary/2020 Admissions—First Mercy Chance/2019 Admissions—Second Mercy Chance/2018 Admissions—Final Mercy Chance)

Time : Three Hours | Maximum Marks : 100

Part A

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

1. State and explain De Morgan's theorem. Explain with a suitable example how the above theorem is useful in minimizing boolean functions.
2. Explain with a neat diagram the working of a 4-bit full subtractor.
3. Explain with diagrams the working of a MSJK flip-flop. What are its applications ?
4. Compare the characteristics of TTL, ECL and CMOS Logic families.
5. Explain with diagrams the principle of operation of a basic differential amplifier.
6. Explain the steps 'involved in the design of an astable mutlivibrator'. What are its applications ?

(5 × 10 = 50)

Part B

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

1. With suitable examples explain addition and subtraction of BCD numbers.
2. Draw and explain the principle of a parallel adder circuit.
3. Compare Synchronous and Asynchronous counters.

Turn over

4. Define Fan-in and Fan-out. What are their significances ?
5. Explain the parameters of an op-amp.
6. Draw and explain an instrumentation amplifier. What are its uses ?
7. Explain the working of a regenerative comparator ? What are its characteristics ?
8. Explain with diagrams a saw-tooth wave generator using op-amps.
9. Compare Butter worth and Chebyshev approximation methods.
10. Draw and explain the functional block diagram of PLL.
11. Draw and explain the circuit of an anti-log amplifier using op-amps.
12. Draw and explain the block diagram of 723 regulator. IC.

$(10 \times 5 = 50)$