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**BACHELOR OF TECHNOLOGY (C.B.C.S.) (2020 COURSE)**  
**B.Tech.Sem - IV R&A :SUMMER- 2022**  
**SUBJECT : ITC-II: DIGITAL ELECTRONICS**

Day : Thursday  
Date : 16-06-2022

**S-24787-2022**

Time : 10:00 AM-01:00 PM  
Max. Marks : 60

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**N.B.**

- 1) All questions are **COMPULSORY**.
  - 2) Figures to the right indicate **FULL** marks.
  - 3) Draw neat and labelled diagram **WHEREVER** necessary.
  - 4) Assume suitable data, if necessary.
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- Q.1** a) State and prove Demorgan's theorem. (05)  
b) Convert gray code to binary: (05)  
i) 10110 ii) 11001 iii) 10111
- OR**
- Q.1** Simplify  $F(A,B,C,D) = \sum m(0, 1, 3, 5, 6, 7, 10, 14, 15)$  and draw its logic diagram. (10)
- Q.2** a) What is BCD adder? Design a 4 bit BCD adder with suitable logic diagram. (05)  
b) Design a 1 bit magnitude comparator. (05)
- OR**
- Q.2** a) Design a Half adder with suitable logic diagram. (05)  
b) Explain priority encoder in detail (05)
- Q.3** a) What is state machine? Explain Mealy and Moore state machines with examples. (05)  
b) Design 4 bit ring counter. (05)
- OR**
- Q.3** a) What is the difference between Synchronous and Asynchronous counter? (05)  
b) What is S-R flip flop? Explain it with excitation table and neat diagram. (05)
- Q.4** a) What is hazard and hazard free realization? Explain with example. (05)  
b) Explain race free assignment in detail. (05)
- OR**
- Q.4** Explain the following terms: (10)  
i) Race condition ii) Non-critical race condition.
- Q.5** a) State and explain characteristics of digital IC's. (05)  
b) Explain CMOS inverter in detail. (05)
- OR**
- Q.5** a) Design and explain standard TTL with open collector output configuration. (05)  
b) Draw and explain operation of CMOS-NOR gate. (05)
- Q.6** a) What are the different types of ROM's? (05)  
b) Draw and explain structure of SRAM. (05)
- OR**
- Q.6** a) What is the difference between PAL, PLA and PROM. (05)  
b) Draw and explain block diagram of PLA. (05)

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