Exam.Code:0929
Sub. Code: 33668

2125

B.E. (Electronics and Communication Engineering)
Fifth Semester
EC-505: Digital System Design

Time allowed: 3 Hours **Max. Marks: 50**

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Part.

x-x-x

[5X2=10]

1. **(a)** Simplify the Boolean expression using Boolean laws: AB+A'B+AB'

   (b) Explain the term "hazard" in digital system design.
   (c) What is the difference between simplification and minimization of Boolean functions?
   (d) Differentiate between single error detection and single error correction.
   (e) Why is the K-map method preferred over the Boolean algebra method for minimization?.

Part-A

2. **(a)** What is the tabular method for minimization, and when is it preferred over the K-map method? **[5]**
   (b) Explain switching algebra and state its importance in digital system design. **[5]**
3. **(a)** Describe any two methods used for detecting and locating faults in combinational circuits. **[5]**
   (b) What is the iterative consensus method in Boolean function minimization? **[5]**
4. What are the techniques to minimize propagation and wire delays in digital system design? Explain with examples. **[10]**

Part-B

5. **(a)** Draw the truth table of a JK flip-flop and explain how it can be used to eliminate the "race around" problem. **[5]**
   (b) Compare synchronous and asynchronous counters in terms of speed and design complexity. **[5]**
6. Design a sequence detector that outputs 1 whenever the input sequence 101 appears in a serial input stream. Draw the state diagram and provide the excitation table for implementation with D flip-flops. **[10]**
7. Write a note on:
   (a) Synthesis using sequential machines. **[5]**
   (b) Fault Detection and Correction. **[5]**

x-x-x