POKHARA UNIVERSITY

Level: Bachelor   Semester: Spring   Year: 2020

Program: BE   Full Marks: 70

Course: Embedded System   Pass Marks: 31.5

       Time: **2** hrs.

Candidates are required to answer in their own words as far as practicable.
The figures in the margin indicate full marks.

Attempt all the questions.

Group - A: (5×10=50)

1   Traditional fuel injectors are mechanical and are less efficient; spark plug and fuel injectors are not synchronized resulting in unburnt fuel loss. How do you plan to automate this system? Illustrate your design and highlight major characteristics of embedded system.   10

2   Design a 3-bit counter that counts the following sequence 1,2,4,5,7,1,2 …. etc. This counter has an output "odd" whose value is 1 when the current count value is odd. Start from state diagram, draw the truth table, minimize the design logic and draw the final circuit.   10

OR

Design a processor that calculates the GCF of two number. Show the design of data path and propose the diagram of controller.

3   Compose $2^{(K+1)} \times 2n$ memory using $2^K \times n$ Memory modules. Explain Daisy Chain Arbitration.   6+4

4   Assume that the on-chip ROM has a message. Write a program to copy it from code space into the upper memory space starting at address 80H. Also as you place a byte in upper RAM give a copy to P0. Explain multilevel bus architecture.   6+4

5   Explain the problems of procedural programming language and highlight Characteristics of Real Time Operating System. Also explain the problem that arises when global resource is shared among different application and how semaphore can solve this issue.   10

Group - B: (1×20=20)

6   Describe different Vhdl Modeling Styles and implement full adder using structural modeling. Design a sequence detector that detects the sequence "1101" using JK flipflop.   10+10