

POKHARA UNIVERSITY

Level: Bachelor
Programme: BE
Course: Embedded System

Semester: Spring

Year : 2021
Full Marks: 100
Pass Marks: 45
Time : 3 hrs.

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) How embedded design differs from conventional computing? Explain the basic structure of an embedded system. 7
b) Design 1101 sequence detector (Overlapping) using D flip – flop. 8
2. a) Design custom single-purpose processor to find the greatest among three numbers. Your design should include algorithm, FSDM and data path. 9
b) Define control unit of general-purpose processor? Explain sub-operations of the instruction cycle. 6
3. a) How can we get 32x12 ROM from 16x8 ROM? 8
b) What is arbitration? Explain Daisy chain arbitration with necessary diagram. 7
4. a) Explain RTOS task and its states. 8
b) Define Monolithic, Micro and Exo kernel. 7
5. a) Why RTOS are preferred in embedded system? Differentiate between clocking communication and task synchronization. 7
b) Write a program for 8051 microcontrollers to provide the on/off time to three traffic lights (Green, Yellow, and Red) and two pedestrian signs (WALK and DON'T WALK), as shown in table below 8

Lights	On Time
1. Green	15 seconds
2. Yellow	5 seconds
3. Red	20 seconds
4. WALK	15 seconds
5. DON'T WALK	25 seconds

The Green and WALK sign should be turned on together, the Red and DON'T WALK sign should be turned on together, and the Yellow and DON'T WALK sign should be turned on together. Use timer to match the turn on time

6. a) Write a VHDL code to simulate 1x8 Demultiplexer. 7
- b) What are the advantages of using VHDL instead of any other HDL? 8
Differentiate between behavioural and structural architecture in VHDL.
7. Write short notes on: (**Any two**) 2×5
 - a) Cross Assemblers
 - b) Address Decoding
 - c) Storage permanence and write ability of memories