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**Presidency University**

**Bengaluru**

**SCHOOL OF**

**Summer Term Examinations, Aug 2024**

**Winter Semester**: 2023-24

**Course Code**: ECE 3048

**Course Name**: Fpga for embedded system

**Program & Sem**: B Tech/7th Sem

**Date**: 05/8/2024

**Time**: 01:00 PM– 4:00 PM

**Max Marks**:100

**Weightage**: 50 %

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Do not write any matter on the question paper other than roll number.*

**Part A [Memory Recall Questions]**

**Answer all the Questions. Each question carries Two marks. (5Qx 4M= 20M)**

1. If we need a little logic to implement, we will choose CPLD and for a complex function we will use FPGA. Explain the difference between CPLD and FPGA .

(C.O.No.1) [Knowledge Level]

1. An embedded system is a microprocessor-based computer hardware system with software that is designed to perform a dedicated function, either as an independent system or as a part of a large system. List the components of Embedded system.

(C.O.No.1) [Knowledge Level]

1. Programable logic devices have upgraded themselves. List all the programmable logic devices. Why FPGA is preferred choice for the designers, what are the components of FPGA.

(C.O.No.2) [Knowledge Level]

1. Chip development cycles are long process and takes months to develop the product, what is the choice available to design teams accelerate time to market?List the benefits of the same

(C.O.No.3) [Knowledge Level]

1. Keywords and Data types in Verilog inform the compiler whether to act as a transmission line (like a wire) or store data. Describe keywords and the data types NET and REG with example?

(C.O.No.2) [Knowledge Level]

**Part B [Thought Provoking Questions]**

**Answer all the Questions. Each question carries Ten marks. (5Qx10M=50M)**

1. To achieve fast time, three popular devices FPGA, ASIC and CPLD are available, Designers need make tough choices among them to select for their final implementation.

(C.O. No1 )[Comprehensive Level ]

1. Hardware description language plays a role in deciding the target FPGA device for design.   
   (a) List various styles of modeling as per Y chart of the modeling [4]   
   (b) If you have been asked to design combinational logic shown below using Verilog, Which method you will select and also write Verilog code using that method [1+5]

(C.O.No.2) [Comprehensive Level]

1. Embedded systems are programmed using embedded programming. Define embedded systems. With the help of system level architecture describe the embedded systems. List the various operating systems available for specific applications such as agriculture and medical application.

(C.O.No.2) [Comprehensive Level]

1. Embedded system is are classified into two different class based on the data and instruction they access from memory known as RISC and CISC ?
   1. Explain difference between RISC and CISC [4]
   2. List Application of Embedded processor[2]
   3. Why FPGA are the better choice for Embedded system, List the Ip available in FPGA [4]

(C.O.No.3) [Comprehensive Level]

1. Once we create soft core processor, most important part is programming a soft-core processor.   
   (a) Mention various software platforms available to programme softcore processor.  [2]  
   (b) Name software interface available in Quartus prime to program soft core processor. [2]  
   (c) List the difference between embedded programming and application programming for embedded systems. [6]

C.O.No.3) [Comprehensive Level]

**Part C [Problem Solving Questions]**

**Answer all the Questions. Each question carries Twenty marks. (2Qx15M=30M)**

1. Hardware description language is used to design and programme FPGA for specific design.   
   (a)List the two popular HDL languages for programming FPGA?[2]  
   (b)List the three popular software which allows HDL coding?[3]  
   (d) Using behavioral style of programming to write a HDL code for 8:1 multiplexer that can be implemented on FPGA?[6]

(C.O.No.3) [Application Level].

1. To EDA tools helps to create VLSI design in reality and also make it easy job to handle the Timing constraints and RTL design. These tools need to follow a systematic design flow of to achieve the great design. If you are a VLSI designer and you have been asked to create a prototype of the device   
   1. List various design modelling styles used in VLSI design?[3]     
   2. Explain the VLSI design flow in detail to final implementation on FPGA?[8]

3. List the types of simulations available in VLSI design Flow[4]

(C.O.No.)[Comprehensive Level].