

# Question Paper

Exam Date & Time: 23-Apr-2024 (10:00 AM - 01:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal School of Information Sciences (MSIS), Manipal  
Second Semester Master of Engineering - ME (Embedded Systems) Degree Examination - April / May 2024

### Virtual Prototyping (Elective -II) [ESD 5238]

**Marks: 100**

**Duration: 180 mins.**

**Tuesday, April 23, 2024**

**Answer all the questions.**

- 1) Describe dynamic binding in C++ using an example. (L2, CO1, PO3) (10)
- 2) Implement a combinational circuit using SystemC with monitor and driver for an AND gate. (L3, CO1, PO3) (10)
- 3) Implement a sequential circuit using SystemC with monitor and driver for a 4-bit shift register. (L3, CO2, PO3) (10)
- 4) Implement a circuit using SystemC with monitor and driver that outputs 1 if 100 is present at the end of the string. The input alphabet comprises of {0, 1}. (L3, CO2, PO3) (10)
- 5) Describe the structure of a transaction in TLM. (L2, CO3, PO3) (10)
- 6) Describe the DMI interface with respect to TLM. (L2, CO3, PO3) (10)
- 7) Distinguish between ASIC and FPGA (L3, CO3, PO3) (10)
- 8) Explain the lookup table. Where are they used in FPGAs? (L3, CO3, PO3) (10)
- 9) Describe the use of Virtual Prototyping in SOC flow. (L2, CO1, PO3) (10)
- 10) Describe any 5 open-source software tools used for virtual prototyping. (L2, CO1, PO3) (10)

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