

06EC6045

Reg. No \_\_\_\_\_

Name \_\_\_\_\_

**A P J ABDUL KALAM TECHNOLOGICAL UNIVERSITY****M.TECH DEGREE EXAMINATION, DECEMBER 2017****FIRST SEMESTER****Branch: VLSI & Embedded Systems****Embedded System Design****Time: 3 Hours****Max. Marks: 60****PART A***Answer ALL questions*

1. What is a design metric? Explain the most common design metrics
2. Explain RT level combinational components with the help of diagrams.
3. List out and explain different memory devices used in microcontroller based embedded systems.
4. Write the differences between Open loop and Closed loop Control systems.

**(4 x 5 marks =20 marks)****PART B**

- 5.(a) With the help of a neat sketch, distinguish between general purpose processors, single purpose processors and application specific processors [5]
- (b) A certain FMCG product has a life time of 52 weeks. Calculate the percentage revenue loss for a delayed market entry of 4 weeks. [5]

**OR**

- 6.(a) Explain the three main IC technologies. What are the benefits of using each of the three different IC technologies ? [5]
- (b) With the help of a neat sketch explain an embedded system taking a digital camera as an example [5]

7. (a) Explain in detail the basic architecture of a general purpose processor with the help of a block diagram. [6]

(b) Differentiate between superscalar and VLIW architectures. [4]

**OR**

8.(a) Design a custom single purpose processor for the calculation of GCD of two numbers. Translate the design into a FSM and sketch the probable datapath. [6]

(b) Explain in detail the commonly used techniques for the optimization of programs and FSM's by considering calculation of GCD as the example. [4]

9. (a) Explain the three basic techniques by which Cache mapping can be accomplished [5]

(b) Write short notes on

(i) I<sup>2</sup>C (ii) CAN (iii) FireWire [5]

**OR**

10. (a) With the help of appropriate sketches, explain ISA bus protocol for DMA memory read and memory write operations [5]

(b) Explain about memory composing in embedded system design [5]

11. With neat sketch, design an open loop Cruise controller for automobile Industry

**OR**

12. (a) Explain the two key features of real physical control systems. [4]

(b) Discuss the practical issues of computer based control. [6]

**(4 x 10 marks =40 marks)**