Register No.: ..... Name: .....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIRST SEMESTER M.TECH DEGREE EXAMINATION (Regular), DECEMBER 2023

VLSI AND EMBEDDED SYSTEMS

(2021 Scheme)

Course Code: 21VE103

Course Name: Design with ARM Microcontrollers

Max. Marks: 60 **Duration: 3 Hours**

PART A

(Answer all questions. Each question carries 3 marks)

1. Outline various challenges in embedded system design.
2. Explain the principle of operation of OLED.
3. Illustrate the conversion steps from source file to an executable file.
4. List out the important features that make the ARM ideal for embedded applications.
5. Explain the following ARM instruction with examples.
   (i) STMFD (ii) BLX (iii) MRS
6. Write an assembly program in ARM to find the factorial of the given number.
7. Draw the bit definition of VIC Interrupt Enable Register.
8. What are the steps for configuring timer?

PART B

(Answer one full question from each module, each question carries 6 marks)

MODULE I

9. Draw and explain the Architectural Business Cycle (ABC) of an Embedded System. (6)

OR

10. Describe the basic elements of embedded system with a block diagram. (6)

MODULE II

11. Distinguish between SRAM and DRAM technology. Why is SRAM the preferred memory technology for cache? (6)

OR

12. What are the steps to be taken in embedded design for low power dissipation? (6)

MODULE III

13. List the components of an IDE and derive the role of each component. (6)

OR

14. With neat sketches, explain briefly how to download hex file to non-volatile memory. (6)

MODULE IV

15. Describe the functional block diagram of ARM920T core processor with neat sketch. (6)

OR

16. Describe AMBA based bus system with diagram (6)

MODULE V

17. Illustrate the working of any four ARM instruction which uses barrel shifter during execution. (6)

OR

18. Write assembly program in ARM to swap the contents of two registers without using an intermediate storage location. (6)

MODULE VI

19. Write a program for serially transmit a character at a baud rate of 9600. (6)

OR

20. Write a program to design a timer for generating a symmetric square wave at pin P1.16 of an LPC214x MCU, using Timer 0. (6)

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