

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIRST SEMESTER M.TECH DEGREE EXAMINATION (Regular), FEBRUARY 2022*(VLSI & 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. Draw and explain the Architectural Business Cycle (ABC) of an Embedded System.
2. What are the steps to be taken in embedded design for low power dissipation?
3. Distinguish between compilation and cross compilation.
4. Draw the bit structure of a Current Program Status Register.
5. Given the contents of R3 and R4 as $R3 = 0xFF00F0$, $R4 = 0x0FF00FF0$ and $R0 = 0$. Find the values in R1, R2 at the end of the sequence of instructions shown
 - i) EORS R1, R3, R4
 - ii) ANDS R5, R3
6. Explain the difference between subtract instructions and compare instructions in ARM.
7. Draw the bit definition of VIC Interrupt Enable Register.
8. Calculate the value of PWMMR0 and PWMMR3 to get a pulse train of 10ms and duty cycle of 50%.

PART B*(Answer one full question from each module, each question carries 6 marks)***MODULE I**

9. What do you mean by Embedded Systems Design and Development Lifecycle Model? List out the various development models on which embedded system design is based upon. Name and describe each of its phases. (6)

OR

10. Discuss the importance of embedded system architecture. (6)

MODULE II

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

OR

12. Explain the principle of data storage in flash memory. Differentiate between NAND and NOR flash structure. (6)

MODULE III

13. Describe the steps in converting source file to an executable file with suitable examples. (6)

OR

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

MODULE IV

15. Explain the features of ARM which have made it a very popular core in the high-end embedded market. Also explain the operating modes in ARM. (6)

OR

16. Draw the register set of ARM and explain the mode switching. (6)

MODULE V

17. Write an assembly program in ARM to do division using repeated subtraction. Explain each instruction in detail. (6)

OR

18. Write an assembly program in ARM to calculate of $3x^2+5y^2$ where $x=5$, $y=3$. (6)

MODULE VI

19. 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)

OR

20. Explain LPC2148 MCU with neat block diagram. (6)
