

M.E. DEGREE EXAMINATIONS: JANUARY 2009

First Semester

APPLIED ELECTRONICS

P07AE104 Advanced Microprocessors and Microcontrollers

Time: Three Hours

Maximum Marks: 100

Answer ALL Questions:-

PART A (20x 1 = 20 Marks)

1. Which of the following facts regarding the CISC and RISC architectures is NOT true?
 - (a) CISC processors generally have a much larger instruction set than their RISC equivalents
 - (b) RISC processors generally cost less to manufacture
 - (c) The CISC architecture does not allow variable code lengths
 - (d) The RISC architecture does not allow use of complex addressing modes

2. What is the correct definition of the term 'CISC'?
 - (a) Continual Input System Computer
 - (b) Control Independent System Computer
 - (c) Central Immediate Source Construct
 - (d) Complex Instruction Set Computers

3. In recent microprocessors, the levels of memory hierarchy is
 - (a) 5
 - (b) 4
 - (c) 3
 - (d) 6

4. Which of the following operations are equivalent?
 - (i) ADD 254, r1 (ii) ADD FE H, r1 (iii) ADD 1111 1111 B, r1 (iv) ADD 377 O, r1
 - (a) (i), (ii) (b) (ii), (iv) (c) (i), (iv) (d) (iii), (iv)

5. The superscalar machine is a _____
 - (a) Pentium processor
 - (b) DSP processor
 - (c) ARM processor
 - (d) PIC microcontroller

6. The Pentium's data and instruction caches gives _____ entries per cache
 - (a) 512
 - (b) 128
 - (c) 64
 - (d) 256

7. The most significant feature of protected mode is
 - (a) Paging
 - (b) Segmentation
 - (c) Multitasking
 - (d) Memory management

8. Real mode uses _____ interrupt vector table beginning at address _____
 - (a) 1KB, 0000AH
 - (b) 1KB, 00000H
 - (c) 1KB, 00010H
 - (d) 1KB, 000FFH

9. The ARM processor is a _____
- (a) Reduced instruction set computer
 - (b) Complex instruction set computer
 - (c) Harvard architecture computer
 - (d) Both (a) and (b).
10. When the ARM processor is executing in Thumb state
- (a) All instructions are 32 bits wide
 - (b) All instructions are 16 bits wide
 - (c) All instructions are 8 bits wide
 - (d) All instructions must be word aligned
11. The number of operating modes in ARM processor is
- (a) 7
 - (b) 5
 - (c) 9
 - (d) 6
12. The ARM processor consists of _____ general purpose registers, _____ status registers and _____ program counter
- (a) 30, 6, 1
 - (b) 29, 7, 1
 - (c) 31, 5, 1
 - (d) 28, 9, 1
13. To operate the 68HC11 in its normal single chip mode, the two pins MODA and MODB must be held _____ and _____ respectively.
- (a) low, low
 - (b) high, low
 - (c) low, high
 - (d) high, high
14. The Motorola 68HC11 chip includes _____ kinds of memory.
- (a) two
 - (b) three
 - (c) four
 - (d) five
15. The Motorola 68HC11 has an
- (a) internal 16 bit address bus
 - (b) internal 8 bit address bus
 - (c) internal 32 bit address bus
 - (d) internal 4 bit address bus
16. The Motorola 68HC11 includes a _____ A/D converter.
- (a) Flash
 - (b) successive – approximation
 - (c) Dual – slope
 - (d) R- 2R type
17. Timer 0 and Timer 1 of PIC microcontroller consists of a _____, _____ counter.
- (a) 8 bit , 16 bit
 - (b) 16 bit , 16 bit
 - (c) 8 bit , 8 bit
 - (d) 16 bit , 8 bit
18. I²C bus developed by
- (a) Philips semiconductor
 - (b) Intel
 - (c) Texas Instruments
 - (d) Motorola
19. The major applications of PIC's UART is to provide
- (a) a single wire serial interface to a PC
 - (b) a two wire serial interface to a PC
 - (c) a single wire parallel interface to a PC
 - (d) a two wire parallel interface to a PC

20. A 40-pin PIC microcontroller consists of _____ I/O pins
(a) 23 (b) 22 (c) 33 (d) 13

PART B (5 x 16 = 80 Marks)

21. (a) (i) Explain any three types of instruction set with an example. (8)
(ii) What is segmentation? List the advantages and disadvantages of segmentation. (8)

(OR)

- (b) (i) Distinguish instruction pipeline with arithmetic pipeline. Define the three types pipeline Hazards (8)
(ii) Explain the evaluation of RISC processor. (8)

22. (a) (i) List the different factors considered in the design of a RISC processor (8)
(ii) With an example explain the Pentium pipelining (8)

(OR)

- (b) (i) What are the differences between Pentium real mode and protected mode Operations (8)
(ii) What is a virtual 8086 monitor? And explain the virtual 8086 mode operation. (8)

23. (a) (i) Draw and explain the ARM 710T CPU organization. (8)
(ii) Distinguish the thumb instruction set over ARM instruction set. (8)

(OR)

- (b) (i) Write the syntax and function of the following ARM instructions
(a) MVN (b) ADR (c) LDMIA. (8)
(ii) Explain the ARM memory interface in detail. (8)

24. (a) (i) List out the operations to be performed automatically when the 68HC11 comes out of reset (8)
(ii) Discuss the interrupts handling mechanism of Motorola 68HC11. (8)

(OR)

- (b) (i) Explain any one operating modes of Motorola 68HC11. (8)
(ii) Discuss the different facilities offered by serial communications interface of Motorola 68HC11. (8)

25. (a) (i) Explain the UART data handling with transmit data circuit (8)
(ii) Discuss how the Timer 1 of PIC microcontroller used to count external events (8)

(OR)

- (b) (i) Give the details of CPU registers of the PIC microcontroller (8)
(ii) List the nine groups of instruction set available in PIC microcontroller (8)
