B.E. Sixth Semester (Computer Sci. & Engg., Computer Engg.) (CGS)

10335 / 10276 : Computer Architecture : 6 KS 04 / 6 KE 04

P. Pages : 2 | AU - 2784

Time : Three Hours | Max. Marks : 80

Notes : 1. Due credit will be given to neatness and adequate dimensions.
2. Retain the construction lines.
3. Illustrate your answer necessary with the help of neat sketches.
4. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION-A

1. a) Write a program to computer $X = (A + B * C) / (D - E + F)$ in the following format. **8**

i) Zero-Address instruction

ii) One -Address instruction

iii) Two-Address instruction

iv) Three-Address instruction

b) What is the need of transfer of control instruction? Explain with example. **6**

OR

2. a) Perform the following operation by 3-bits on, **8**
R_1=10011101 & R_2 =10101000

i) Logical Left shift (3-bits)

ii) Logical Right shift (3-bits)

iii) Arithmetic Right shift (3-bits)

iv) Right Rotate (3-bits)

b) Explain Intel X86 operation types, with example. **6**

3. a) Explain ARM instruction format with Thumb instruction set. **7**

b) Explain PDP-10 instruction format with proper diagram. **6**

OR

4. a) Explain X86 Addressing modes in detail. **7**

b) What are the design issues in instruction format? **6**

5. a) Explain six stages of CPU instruction pipelines with example. 7

b) Explain with diagram ARM processor organization in detail. 6

OR

6. a) What is data hazards? Explain with example & timing diagram. 6

b) What is instruction cycle? Explain with diagram, the data flow for indirect cycle. 7

SECTION-B

7. a) Consider the following sequence of instruction, 8

Load rA, M
Load rB, M
Add rC, rA+ rB
Store M, rC
Branch X

Analyze their execution:

i) Without pipelining
ii) With Two-stage
iii) Three-Stage pipelining.

b) What is delayed branch? Explain the techniques for pipeline optimization. 6

OR

8. a) Explain the compiler-based register optimization with example. 7

b) What are the some typical characteristics of a RISC instruction set architecture? 7

9. a) What are the basic tasks performed by microprogrammed control unit? 6

b) What is Micro-operation? Explain the elements of instruction cycle. 7

OR

10. a) Explain the functioning of control unit in hardwired implementation. 7

b) Explain control unit model with the help of various control signal. 6

11. a) What is cache coherence problem? Discuss the software & hardware approach for cache coherence. 7

b) Explain General organisation for multicore systems. 6

OR

12. a) What are same of the potential advantages of SMP compared with uniprocessor. 6

b) What is clustering? What are the sky benefits of clustering? Write configuration & operation system design issues. 7

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