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Roll No.

333456(33)

**B. E. (Fourth Semester) Examination,
Nov.-Dec. 2021**

(New Scheme)

(IT Branch)

COMPUTER ORGANIZATION and ARCHITECTURE

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Attempt all questions. Part (a) of each question is compulsory. Attempt any two parts from (b), (c), (d) of each question. The figures in the right-hand margin indicate marks.

Unit-I

1. (a) What are the basic functions that a computer can perform? 2

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- (b) Explain Harvard Architecture with proper diagram. 7
- (c) Explain different type of instruction formats used to perform various operation in computer. 7
- (d) What is Bus interconnection? Explain interconnection *w.r.t.* memory, CPU and I/O units. 7

Unit-II

2. (a) Explain underflow with example. 2
- (b) Solve $(15) \times (-13)$ using Booth multiplication Algorithm. 7
- (c) Solve using divide algorithm and calculate value of A and Q . $448 \div 17$. 7
- (d) Explain flow chart for decimal multiplication with example. 7

Unit-III

3. (a) Explain function of control unit? 2
- (b) Explain Hardwired control unit diagram. 7

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- (c) Explain address sequencing with diagram in detail. 7
- (d) What is μ operation (microoperation)? How can microoperation used for execution of an instruction? 7

Unit-IV

4. (a) Explain Bootstrap Loader. 2
- (b) How Cache memory accessing is fast. Explain Associative mapping of Cache memory. 7
- (c) What is the purpose of match logic and key register in associative memory. Draw one cell of associative memory to explain Match logic. 7
- (d) Design a memory connection and address map with processor. 7

RAM Chips – 256×8

ROM Chips – 1024×8

System needs 2 K bytes of RAM and 4 K bytes of ROM.

Unit-V

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5. (a) Explain type of Interrupts. 2
- (b) Explain methods of Asynchronous data transfer between I/O devices. 7
- (c) Explain I/O processor with diagram. 7
- (d) Explain 4 segment instruction pipeline. Draw space-time diagram for it. 7