

**GANPAT UNIVERSITY**  
**B.Tech. Sem. V: Electronics & Communication Engineering**  
**Regular/Remedial Examination, Nov-Dec 2015**  
**2EC504: Computer Organisation**

**MAX. Time: 3 Hrs.]**

**[MAX. Marks: 70**

**Instructions:**

1. Attempt all questions.
2. Answers to the two sections must be written in separate answer books.
3. Figures to the right indicate full marks.
4. Assume suitable data, if necessary.

**SECTION: I**

- Q:1** (A) Draw and explain structure of IAS Computer. (4)  
 (B) What are the advantages of Transistor over Vacuum tube? (4)  
 (C) Which are the two Fundamental Computer Elements? Draw and explain each. (4)

**OR**

- Q: 1** (A) What is basic instruction cycle? Draw and explain block diagram of instruction cycle with interrupts. (4)  
 (B) Explain in detail hardwired implementation of a control unit. (4)  
 (C) Which are the three types of pipelining hazards? Briefly explain resource hazard with the help of suitable example. (4)
- Q:2** (A) Explain the internal structure and working of DRAM with the help of diagram. (4)  
 (B) What is the general relationship among access time, cost, and capacity of memory? (4)  
 (C) Define the terms track, cylinder, and sector. (3)

**OR**

- Q:2** (A) Explain the internal structure and working of SRAM with the help of diagram. (4)  
 (B) Which are the three performance parameters of memory? Explain in brief. (4)  
 (C) Explain read-write mechanism and list down limitation of the following external memories. (3)  
 (a) Magnetic disk (b) Magnetic tape (c) Optical disk
- Q:3** (A) Consider a 32-bit microprocessor that has an on-chip 16-KByte four-way set-associative cache. Assume that the cache has a line size of four 32-bit words. Draw a block diagram of this cache showing its organization and how the different address fields are used to determine a cache hit/miss. Where in the cache is the word from memory location ABCDE8F8 mapped? (4)  
 (B) For the 8-bit word 00111001, the check bits stored with it would be 0111. Suppose when the word is read from memory, the check bits are calculated to be 1101. What is the data word that was read from memory? (4)



- (C) Consider a magnetic disk drive with 8 surfaces, 512 tracks per surface, and 64 sectors per track. Sector size is 1 KB. The average seek time is 8 ms, the track-to-track access time is 1.5 ms, and the drive rotates at 3600 rpm. Successive tracks in a cylinder can be read without head movement. (4)
- What is the disk capacity?
  - What is the average access time? Assume this file is stored in successive sectors and tracks of successive cylinders, starting at sector 0, track 0, of cylinder  $i$ .
  - Estimate the time required to transfer a 5-MB file.
  - What is the burst transfer rate?

## SECTION-II

- Q:4 (A) Convert following decimal numbers into single precision binary representation of IEEE 754 standard. (6)  
(a) 250.25 (b) -15.175 (c) 25.625
- (B) Why reduced instruction set computer (RISC) is different than complex instruction set computer (CISC)? Discuss in detail. (6)
- OR
- Q: 4 (A) Briefly explain the reason of use of large register file in RISC and concept of overlapped register windows. (6)
- (B) Describe the flow chart of floating point addition and subtraction with appropriate drawing. (6)
- Q: 5 (A) Convert following decimal numbers into double precision binary representation of IEEE 754 standard. (6)  
(a) 570.225 (b) -325.05 (c) 875.225
- (B) Describe the flow-chart of floating point multiplication with appropriate drawing. (5)
- OR
- Q: 5 (A) List three broad classifications of external or peripheral devices and draw external device block diagram. (6)
- (B) Briefly define three techniques for performing I/O. (5)
- Q: 6 (A) Explain in detail hardwired implementation of a control unit. (6)
- (B) Draw and explain working of control unit for basic computer. (6)

**END OF PAPER**