

TE comp / sem-V / CBSGS / DT- 23/05/2017.

Q.P. Code : 581201

(3 Hours)

[Total Marks : 100

N.B. : (1) Question No.1 is **compulsory**.(2) Answer **any four** questions from **Q.No.2 to Q.No.7**.(3) **Figures** to the **right** indicate **full marks**.(4) Assume suitable **data** if **required**.

1. (a) What is memory segmentation? State advantages of memory segmentation. 5
- (b) What is GDT? Explain structure of GDT. 5
- (c) Explain integer pipeline of Pentium processor? 5
- (d) Briefly explain string instructions of 8086. 5
2. (a) Design 8086 based system for following requirements : 10
 - (i) Clock frequency 5 MHz
 - (ii) 512 KB RAM using 32 KB x 8
 - (iii) 256 KB ROM using 32 KB x 8
- (b) Draw and explain block diagram of 8253. 10
3. (a) Explain DMA data transfer modes in brief. 10
- (b) Explain, with neat diagram, address translation mechanism implemented on 80386DX. 10
4. (a) Explain, with neat diagram, cache memory organization is supported by Pentium processor. 10
- (b) Draw and explain block diagram of Pentium processor. 10
5. (a) Draw and explain block diagram of SuperSparc processor. 10
- (b) Explain interrupt structure of 8086. 10
6. Write short note on :
 - (a) Mixed language programming 5
 - (b) Virtual 86 mode of 80386DX 5
 - (c) Branch prediction logic 5
 - (d) Control registers of 80386DX 5

(3 Hours)

Total Marks : 80

- N.B.**
1. Q.no.1 is **compulsory**
 2. Attempt any **three** out of the remaining five questions
 3. Figures to **right** indicate **full** marks
 4. Assume suitable data if necessary but justify the same

- Q.1. Attempt the following (Any four)
- a. Compare the monolithic and microkernals [5]
 - b. Explain the Internal and External Fragmentation [5]
 - c. What is mutual exclusion? Explain its significance [5]
 - d. What is a semaphore? Elaborate with example, the significance of semaphores [5]
 - e. Explain the effect of page size on performance of Operating System [5]

- Q.2. a. Calculate hit and miss for the following string using page replacement policies – FIFO, LRU and Optimal. Compare it for the frame size 3 & 4.
- 1 2 3 2 1 5 2 1 6 2 5 6 3 1 3 6 1 2 4 3 [10]
- b. What is a deadlock? Explain the necessary and sufficient conditions for the deadlock. Also suggest techniques to avoid deadlocks. [10]

- Q.3. a. Explain an algorithm for dining philosophers problem [10]
- b. Explain the banker’s algorithm in detail. [10]

- Q. 4. a. Explain the hardware support for paging [10]
- b. Assume the following processes arrive for execution at the time indicated and the length of cpu burst time given in msec. [10]

Job	Burst time	Priority	Arrival time
P1	10	5	0
P2	6	2	0
P3	7	4	1
P4	4	1	1
P5	5	3	2

For the above process parameters, find average waiting times and average turnaround times for the following scheduling algorithms- First Come First Serve, Shortest Job First, non preemptive priority Round Robin (assume quantum=5 units)

- Q.5. a. Explain the process transition diagram for UNIX operating system [10]
- b. Compare the following Disk scheduling algorithms using appropriate example- SSTF, FCFS, SCAN, C-SCAN, LOOK [10]

- Q.6. Write notes on the following: [20]
- a. Resource Allocation Graph
 - b. Process Control Block
 - c. System Components in Windows Architecture
 - d. Scheduling in Linux system

DT-5/6/2017

TE/comp/sem-IV/CBSGIS

Q.P. Code : 581400

(3 HOURS)

[Total Marks: 80]

- N.B.: (1) Question no. 1 is compulsory.
(2) Attempt any three questions from remaining.
(3) Assume suitable data wherever necessary.

Q.1. Answer the following: [20]
a) Explain the representation of Zachman Framework for an Enterprise.
b) Describe different phases of SDLC.

Q.2. a) Explain purpose of use case diagram with example. [10]
b) Draw two levels of DFD for Stock/Inventory Management System. The items which are purchased from the various dealers and suppliers are recorded into the database. The software system provides facilities for adding new item, removing an item, updating the stock, purchasing and total stock. [10]

Q.3 a) You are required to present an outline design of a system that will be used by doctors at a medical practice to keep basic patient records. The system should record each consultation between a doctor and patient, any illness diagnosed, and any drugs prescribed to the patient. At regular intervals, an auditor will use the system to check whether the same drug is being prescribed repeatedly to a particular patient. Draw UML Class diagram for system to support this functionality. [10]

b) Explain Cohesion and coupling in short. [10]

Q.4 a) A project requires an initial investment of Rs. 2,25,000 and is expected to generate the following net cash inflows:

Year	1	2	3	4
Cash inflow (Rs.)	95,000	80,000	60,000	55,000

Compute net present value of project if the minimum desired rate of return is 12%. [10]

b) Draw Interaction/Communication diagram for new course registration at college. [10]

Q.5 a) Explain the need of deployment diagram. Draw a deployment diagram to model fully distributed systems. [10]

b) Draw a state diagram for online shopping system where a Customer can browse through the product catalog and add the items to shopping cart. He will require to login for purchase with different payment options and provided to give feedback. [10]

Q.6 Write short notes on: (Any two) [20]

- a) Application Architecture
- b) Principles of user interface (UI) design
- c) Software requirements specification (SRS)
- d) Design pattern

