CIA AND QUESTION BANK

THE STANDARD FIREWORKS RAJARATNAM COLLEGE FOR WOMEN (AUTONOMOUS), SIVAKASI – 626 123.

(Affiliated to Madurai Kamaraj University, Re-accredited with A Grade by NAAC,
College with Potential for Excellence by UGC and Mentor Institution under UGC PARAMARSH)

OBE BASED TERM TEST QUESTION PAPER

Term Test - III – Oct.2019

Course Code &Title: HLPH1E2 & Digital Logic Design **Date :14-10-2019**

Class : I PG **Time : 2 hrs**

Semester : I **Max marks : 50 mks**

Course Outcome	Bloom's K-level	Qn No	SECTION – A (5 x 1 = 5 marks) Answer ALL Questions
CO2	K2	1.	A group of flip-flops sensitive to the pulse duration is known as _____
CO2	K2	2.	**Say True or False:** A register can replace a latch.
CO3	K3	3.	State any one step involved in the design of sequential circuit.
CO3	K3	4.	An n-bit binary counter is capable of counting from _____ to _____.
CO4	K4	5.	**Say True or False:** The analysis of a sequential circuit starts from the state table and ends with a circuit diagram.
Course Outcome	**Bloom's K-level**		**SECTION – B (3 x 7 = 21 marks) Answer All Questions choosing either (a) or (b)**
CO2	K2	6a.	Explain a 2-to-4 demultiplexer with circuit diagram, block diagram and truth table**.**
			(OR)
CO2	K2	6b.	Discuss the working of decoder with circuit.
CO3	K3	7a.	Design a 3-bit binary counter from its state diagram.
			(OR)
CO3	K3	7b.	Construct a four bit register with D flip-flops.
CO4	K4	8a.	Analyze the 4-bit bidirectional shift register using D flip-flop and multiplexer.
			(OR)
CO4	K4	8b.	Analyze the binary up-down synchronous counter using T flip-flop.
Course Outcome	**Bloom's K-level**		**SECTION – C (2 x 12 =24 marks) Answer All Questions choosing either (a) or (b)**
CO5	K3	9a.	Apply the design procedure to construct Mod6 counter using JK flip-flop to follow the given binary sequence.: 000, 001, 100, 110, 010, 011.
			(OR)

CO5	**K3**	**9b.**	Construct the BCD counter with JK flip-flops.
CO3	**K3**	**10a.**	Develop a circuit for 4- bit shift register with D flip-flops and design the circuit diagram of a 4-bit binary ripple down-counter using flip-flops that trigger on the positive-edge transition. (OR)
CO3	**K3**	**10b.**	a) Develop the circuit for 8-to-3line encoder and discuss their working based on their truth table. b) Develop the circuit of a full adder using 3- to - 8line decoder (IC) and two OR gates.

Assessment Summary:

CO	Remember K1	Understand K2	Apply K3	Analyze K4	Evaluate K5	Total
CO1						
CO2		9				**9**
CO3			21			**21**
CO4				8		**8**
CO5			12			**12**
Total		**9**	**33**	**8**		**50**

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OBE BASED QUESTION BANK

Name of the Programme	**: B.Sc Computer Science**
Name of the Course	**: Operating Systems**
Name of the Course Code	**: GLCS5E2**
Name of the Course Teacher	**: Dr.C.Devi Arockia Vanitha**

QUESTION BANK

SECTION – A

CO1: illustrate the structure of operating systems and explain the concepts of process and memory management [K2]

Choose the Best Answer

1. An **operating system** is software that manages the computer hardware as well as providing an environment for application programs to run.
   a) operating system b) database system c) API d) storage system
2. The operating system is the program most intimately involved with the hardware and hence the name **resource allocator**.
   a) resource allocator b) resource system
   c) hardware allocator d) software allocator
3. The **main memory** is usually a volatile storage device that loses its contents when power is turned off or lost.
   a) main memory b) hard disk c) ROM d) secondary memory
4. **Secondary storage** devices provide a form of non volatile storage area that is capable of holding large quantities of data permanently.
   a) main memory b) secondary storage c) CPU d) ROM

Say True or False

69. An operating system is a program that manages the computer hardware - **True**.
70. An operating system can be viewed as a resource allocator – **True**.
71. Kernel is a program that is running all times on the computer – **False**.
72. DRAM stands for Direct Random Access Memory – **False**.
73. Software may trigger an interrupt by executing a special operation called a monitor call – **True**.
74. The store instruction moves a word from main memory to an internal register within the CPU – **False**.
75. Magnetic disk is non-volatile - **True**.
76. SCSI stands for Small Computer Systems Interface – **True**.
77. Multiprocessor systems are also known as loosely coupled systems – **False**.
78. Symmetric multiprocessing (SMP) scheme defines a master-slave relationship – **False**.
79. NUMA stands for Non-Uniform Memory Access – **True**.
80. A program in execution is called a process – **True**.
81. At any instant, only one process can be running on any processor - **True**.
82. PCB is also called as task control block – **True**.
83. A single thread of execution of a process performs only one task at one time – **True**.
84. The objective of multiprogramming is to have some process running at all times, to maximize the CPU utilization – **True**.
85. The objective of time sharing is to switch the CPU among processes so frequently that users can interact with each program while it is running – **True**.

CO2: analyze the various CPU scheduling algorithms [K4]

114. Put the following in the chronological order in the context of the birth of a process executes: Ready, suspended, execute, terminate, create.
Ans: Create, Ready, Execute, Suspended, Terminate

115. A Shortest Job First algorithm may lead to starvation where a process with large execution time is made to wait for indefinitely long times. Suggest a modification to the SJF that overcomes this problem.
Ans: A clock value (arrival time) is stored for each process. This helps to determine the priority of a process as a function of execution time and the clock value.

116. Suppose a new process in a system arrives at an average of six processes per minute and each such process requires an average of 8 seconds of service time. Estimate the fraction of time the CPU is busy in a system with a single processor.
Ans: Given that there are on an average 6 processes per minute.
So the **arrival rate = 6 process/min**.
i.e. every 10 seconds a new process arrives on an average.
Or we can say that every process stays for 10 seconds with the CPU
Service time = 8 sec.
Hence the fraction of time CPU is busy = **service time / staying time**
= 8 / 10
= 0.8

CO3: identify and handle the deadlocks in process synchronization [K3]

118. Semaphore is used for:
a) Preventing deadlocks
b) Supporting mutual exclusion
c) Protecting processes from corrupting each other's address space
d) Supporting virtual memory

119. Consider an operating system running multiple processes having exclusive resource requirements from a set of resource classes. Further assume that there is exactly one resource in each resource class. Then, a directed cycle in the resource allocation graph would indicate which one of the following?
a) A deadlock might occur in the future.
b) All processes are deadlocked.
c) Some processes are deadlocked.
d) The system is safe from deadlock.

SECTION – B

CO1: illustrate the structure of operating systems and explain the concepts of process and memory management [K2]

1. What Operating Systems do? Explain with example.
2. Give a brief note on user view and system view of OS.
3. Discuss computer system operation with neat diagram.
4. Explain I/O Structure in detail.
5. Explain the storage hierarchy with necessary diagram.
6. Write short notes on Single processor systems.
7. Write short notes on multiprocessor systems.
8. What are clustered systems? Explain.
9. Discuss dual mode operation in detail.
10. Comment on Protection and Security.
11. Write about Mass storage management.
12. What is caching? Explain.
13. Explain CPU-I/O burst cycle with a neat sketch.
14. Write a note on Preemptive scheduling.
15. Define process state. Explain the different states of the process with diagram.
16. Explain Process Control Block.

CO2: analyze the various CPU scheduling algorithms [K4]

61. Analyze the working of Priority Scheduling Algorithm with an example.

62. Consider the following set of processes with the length of the CPU burst given in milliseconds:

Process	Burst Time
P1	5
P2	12
P3	16
P4	18
P5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5 all at time 0.

i. Draw two Gantt charts that illustrate the execution of these processes using the Round Robin scheduling algorithm with Time Quantum **3** and **5**.

SECTION – C

CO1: illustrate the structure of operating systems and explain the concepts of process and memory management [K2]

1. Explain Computer system Architecture in detail.
2. Discuss on Computer system organization.
3. Briefly explain the operating system operations with example.
4. Explain Operating system structure with example.
5. Describe process management and memory management.
6. Write a brief note on Process scheduling.

CO4: demonstrate the different memory management strategies [K2]

1. Explain paging mechanism with necessary diagrams.
2. Explain contiguous memory allocation in detail.
3. What is demand paging? Explain demand paging system.
4. Explain FIFO, LRU page replacement algorithms with examples.
5. Briefly explain any three Page Replacement Algorithms.
6. With suitable examples, explain OPT, LRU approximation page replacement algorithms.
7. Explain Thrashing with suitable diagrams.

CO5: interpret the allocation methods of File systems and compare the disk scheduling algorithms [K5]

1. Suppose that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143 and the previous request was at cylinder 125. The queue of pending requests in FIFO order is: 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk-scheduling algorithms?

a) FCFS	b) SSTF	c) SCAN
d) LOOK	e) C-SCAN	f) C-LOOK

ALL THE BEST