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B.E. (Vth Sem.) (CGPA) CSE Examination-2016

OPERATING SYSTEM

Paper - CS-504

Time Allowed : Three Hours

Maximum Marks : 60

Note : Attempt all questions.
Question No. I is compulsory.

Q.I Choose the correct answer— 2 each

- (i) If a process fails, most operating system write the error information to a—
- (a) Log file
 - (b) Another running process
 - (c) New file
 - (d) None of the mentioned
- (ii) To access the services of operating system, the interface is provided by the—
- (a) System calls
 - (b) API
 - (c) Library
 - (d) Assembly instructions

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(2)

- (iii) Which one of the following is the deadlock avoidance algorithm—
- (a) Banker's algorithm
 - (b) Round-robin algorithm
 - (c) Elevator algorithm
 - (d) Karn's algorithm
- (iv) A system is in the safe state if—
- (a) The system can allocate resources to each process in some order and still avoid a deadlock
 - (b) There exist a safe sequence
 - (c) Both (a) and (b)
 - (d) None of the mentioned
- (v) What is a long-term scheduler —
- (a) It selects which process has to be brought into the ready queue
 - (b) It selects which process has to be executed next and allocates CPU
 - (c) It selects which process to remove from memory by swapping
 - (d) None of these

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Contd.

(3)

- (vi) In internal fragmentation, memory is internal to a partition and—
 - (a) Is being used
 - (b) Is not being used
 - (c) Is always used
 - (d) None of these
- (vii) A solution to the problem of external fragmentation is—
 - (a) Compaction
 - (b) Larger memory space
 - (c) Smaller memory space
 - (d) None of these
- (viii) File type can be represented by—
 - (a) File name
 - (b) File extension
 - (c) File identifier
 - (d) None of the mentioned
- (ix) In distributed system each processor has its own—
 - (a) Local memory
 - (b) Clock
 - (c) Both (a) and (b)
 - (d) None of the mentioned

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- (x) Which one of the following linux file system does not support journaling feature —
 - (a) ext2
 - (b) ext3
 - (c) ext4
 - (d) None of the mentioned
- Q.ii What is an operating system ? Also discuss the services of OS. 10

or

Consider the following process and related data—10

Process	CPU Burst	Priority	Arrival Time
P1	5	2	0
P2	10	4	5
P3	8	5	7
P4	5	1	8
P5	4	3	3

Schedule these processes according to —

- (a) Priority scheduling
- (b) SRTF

Also calculate the total turn around time and average waiting time for each process.

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Contd.

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Q.III Consider the following snapshot of a system executing bankers algorithm— 10

	ALLOCATION				MAXIMUM				AVAILABLE			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

- (a) Is the system is in safe state ?
- (b) If the system is safe show how all the process would complete their execution successfully.

or

Assume a system with four processes and three resource types. The claim matrix is given by—

$$C = \begin{pmatrix} 4 & 1 & 4 \\ 3 & 1 & 4 \\ 5 & 7 & 13 \\ 1 & 1 & 6 \end{pmatrix}$$

Where C (i, j) denotes maximum claim of process i for resource j. The total units of each resource type are given by vector (5, 8, 16). The allocation of

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resources is given by the matrix—

$$A = \begin{pmatrix} 0 & 1 & 4 \\ 2 & 0 & 1 \\ 1 & 2 & 1 \\ 1 & 0 & 3 \end{pmatrix}$$

Where A (i, j) denotes number of units of resource j that are currently allocated to process i—

- (a) Find current state is safe or not
 - (b) Find if granting of a request by process 1 for 1 unit of resource type 1 can be safely done.
- Find if granting of a request by process 3 for 6 unit of resource type 3 can be safely done.

Q.IV Consider a logical address space of eight pages of 1024 words each, mapped on to a physical memory of 32 frames. Find out the number of bits in logical address and the number of bits in the physical address. 10

or

Define following with an example : Fragmentation, compaction, paging. 10

Q.V What do you mean by demand paging ? Explain its concept. 10

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Contd.

(7)

or

Consider the following page reference string—

1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9

How many page faults would occur for the following replacement algorithms, assuming 2, 4 and 5 frames being made available—

- (a) FIFO
- (b) LRU
- (c) Optimal

Q.VI Suppose that a disk has 5000 cylinders. The drive is currently serving request at cylinder 143 and the previous request was at cylinder 125. The queue of pending request in FIFO orders is 86, 1470, 913, 1774, 948, 1509, 1022, 1750 and 130. What is the total distance that the disk arm moves for the following algorithms— 10

- (a) FCFS
- (b) SSTF
- (c) LOOK
- (d) C-SCAN

or

Explain various file allocation methods in detail.