



HALDIA INSTITUTE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION UNDER MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL)

Paper Code: PCC-CS 502

Paper Name: Operating Systems

Time Allotted: 3 Hours

Full Marks: 70

The figures in the margin indicate full marks

Candidates are required to give their answers in their own words as far as practicable

Group – A

(Multiple Choice Type Questions)

Choose the correct alternatives from the followings:

15 x 1 = 15

1. (i) What type of software a compiler is? [CO1]
a) Firmware b) Application software c) utility software d) system software
- (ii) At what time, the address binding occurs if the process is supposed to move from one memory segment to other during its execution. [CO5]
a) Compile time b) Load time c) Run time d) None of these
- (iii) The technique of gradually increasing the priority of a process that wait in a system for a long time is known as [CO4]
a) blocking b) aging c) starvation d) convoy effect
- (iv) Which of the following reduces degree of multi programming [CO2]
a) Long term scheduler b) short term scheduler c) middle term scheduler d) all
- (v) General approaches to handling deadlock do not include_____ [CO4]
a) Prevention b) Dogging c) Detection d) Avoidance
- (vi) Find the odd [CO5]
a) Best fit b) Most fit c) First fit d) Worst fit
- (vii) CPU generates _____ [CO2]
a) Logical address b) physical address c) Relative address d) all of these
- (viii) Which scheduling policy is most suitable for a time shared operating system? [CO2]
a) SJF b) SRTF c) RR d) FCFS [CO5]
- (ix) What is the minimum number of memory accesses needed in paging?
a) 2 b) 3 c) 4 d) 5
- (x) In which one of the following page replacement policies, Belady's anomaly may occur? [CO5]
a) FIFO b) Optimal c) LRU d) MRU
- (xi) TLB is implemented using [CO5]
a) Associative memory b) cache memory c) Main memory d) none of these
- (xii) Size of virtual memory is equivalent to the size of [CO5]
a) Main memory b) Secondary memory c) Cache memory d) totality of a) and b)
- (xiii) Increasing the RAM of a computer typically improves the performance because: [CO5]

- a) Virtual memory increases b) Larger Ram is faster
- c) Fewer page faults occurs d) Fewer segmentation faults occur

(xiv) A thread is also called [CO2]

- a) Light weight process b) Heavy weight process
- c) process d) none of these

(xv) In order to allow only one process to enter its critical section, binary semaphore are initialized to [CO3]

- a) 0 b) 1 c) 2 d) 3

Group – B

(Short Answer Type Questions)

Attempt any three from the followings: **3 x 5 = 15**

2. Describe Peterson's Algorithm toward solution to the critical section problem of two processes. [CO3]
5
3. i) Describe the paging hardware in brief with a suitable diagram. [CO5]
ii) Define demand paging and pure demand paging. 3+2 [CO5]
4. Given memory partitions 100 KB, 500 KB, 200KB, 300KB and 600KB (in order). How [CO5]
would each of the first-fit, best-fit and worst-fit algorithms place processes of 212KB,
417KB, 112KB and 426KB (in order)? Which algorithm makes the most efficient use of
memory? 5
5. Consider the following reference string in paging. Then find out the number of page faults using FIFO
and optimal page replacement algorithms and compare the results.
4 7 0 7 1 0 1 2 1 2 7 1 2 for a memory with three frames. 5 [CO5]
6. i) Differentiate between deadlock and starvation. [CO4]
ii) What are the remedies to the problems of deadlock and starvation? 2+3

Group – C

(Long Answer Type Questions)

Attempt any four from the followings: **4 x 10 = 40**

7. i) With a suitable example show, how a resource allocation graph can be mapped to a wait for graph and a
deadlock can be detected from that. [CO5]
ii) Write a short note on C-LOOK disk scheduling algorithm. 5+5 [CO5]
- 8.i) Briefly describe the working principle of TLB. [CO4]
ii) What are different process states? Describe with a suitable diagram. 5+5 [CO4]
9. i) Explain producer process and consumer process (bounded buffer problem) using semaphore. [CO3]
ii) Define deadlock and starvation using semaphore. 6+4 [CO3]
10. Name the various operating system types and write a brief on each. 10 [CO1]
11. i) Explain storage device hierarchy in brief with suitable diagram. [CO1]
ii) Draw and describe a layered operating system. 5+5 [CO1]
12. i) Write a C program to have a child and parent environment where both processes will display their own
as well as parent's process id. [CO2]
ii) Write a C program on signal to implement the ctrl+c operation (termination of a running process) and
to acknowledge the receiving of the signal. 5+5 [CO2]

Answer Key:

Group – A

1. (i) d	(ii) c	(iii) b	(iv) c	(v) b	(vi) b
(vii) a	(viii) c	(ix) c	(x) a	(xi) a	(xii) b
(xiii) b	(xiv) c	(xv) a	(xvi) b	(xvii) a	(xviii) b
(xix) c	(xx) a	(xxi) c	(xxii) b	(xxiii) a	(xxiv) a
(xxv) c	(xxvi) c	(xxvii) b	(xxviii) b	(xxix) a	(xxx) d

Group – B

2. 3. 4. 5. 6. 7. 8. 9. 10. 11.

Group – C

12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23.

Note:

Font: Times New Roman (MS-WORD)

Size: 12

Don't put anything in the header caption **(Red mark line)**

Put exact Paper Code and Paper Name.

Don't put any True/False type question in MCQs.

Don't put less / extra options in MCQs.

Repetition of question is highly prohibited.

Paper setters are requested to put answer of each question in the “Answer Key” section only. Don't highlight/put any answer in the question section.