Code No: **R164204C** **R16** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

OPERATING SYSTEMS

(Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) List out the services provided by an operating system. [3]
   b) When a process creates a new process, what is shared between parent process and child process? [3]
   c) Why are segmentation and paging sometimes combined into one scheme? [2]
   d) Define monitor. [2]
   e) What are the two ways of accessing disk storage? [2]
   f) List out the various interrupts in LINUX. [2]

PART–B *(4x14 = 56 Marks)*

2. a) Write the difference between the function and system call. Briefly explain the six major categories of system calls [7]
   b) Explain the Time-shared operating system. [7]

3. a) Write and explain various scheduling criteria's with respect CPU scheduling. [7]
   b) Explain the process scheduling with a neat queuing diagram. [7]

4. a) Explain the difference between External fragmentation and Internal fragmentation. How to solve the fragmentation problem using paging? [7]
   b) Compare the main memory organization schemes of continuous memory allocation, pure segmentation, and pure paging with respect to the following issues: i) External fragmentation, ii) Internal fragmentation, iii) Ability to share code across the process. [7]

5. a) What is a deadlock? Explain the necessary condition for deadlock [7]
   b) How does the signal() operation associated with monitors differ from the corresponding operation defined for semaphores. [7]

6. a) Elucidate the Indexed allocation of disk space. [7]
   b) Discuss various file access methods in detail [7]

7. a) Illustrate IPC mechanism in LINUX [7]
   b) Explain life cycle of android application [7]

Code No: **R164204C** **R16** **Set No. 2**

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OPERATING SYSTEMS

(Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) What is an operating system? Give some examples. [3]
   b) List Fields of Process Control Block. [3]
   c) What is the cause of Thrashing? [2]
   d) Define the Safe, unsafe, and deadlock state spaces. [2]
   e) What is a file? Give it properties [2]
   f) What is an Activity Stack in Android? [2]

PART–B *(4x14 = 56 Marks)*

2. a) With a neat sketch, Explain in detail about the interrelation between various services provided by the operating system. [7]
   b) What are the advantages and disadvantages of using the same system call interface for manipulating both files and devices? [7]

3. a) Discuss how the following pairs of scheduling criteria conflict in a certain settings. i) CPU utilization and response time, ii) Average turnaround time and maximum waiting time, and iii) I/O device utilization and CPU utilization. [7]
   b) Explain typical elements of inter process communication models. [7]

4. a) Consider the following page reference string: 1,2,4,7,3,5,6,3,6,1,4,2,3,6,5,2 How many page faults would occur for the optimal page replacement algorithm, assuming four frames and all frames are initially empty. [7]
   b) Discuss various issued related to the allocation of frames to processes. [7]

5. a) Explain the following deadlock avoidance algorithms: Banker's algorithm. [7]
   b) What is critical section problem? Write and explain Peterson's solution for it [7]

6. a) Compare the SCAN and C-SCAN disk scheduling algorithms with an example. [7]
   b) Illustrate the various methods for free-space management. [7]

7. a) Discus about interrupt mechanism in LINUX. [7]
   b) What is Android? Is Android Open-Source? Discuss the features of Android. [7]

Code No: **R164204C** **R16** **Set No. 3**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

OPERATING SYSTEMS

(Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) Draw the Layered structure of Operating system. [3]
   b) What is Multi-Threading? [3]
   c) What is Virtual Address Space? [2]
   d) What is Critical Section Problem? [2]
   e) Write about Master File Directory in two-level directory structure. [2]
   f) List the components of LINUX. [2]

PART–B *(4x14 = 56 Marks)*

2. a) Explain the objectives and functions of Operating system [7]
   b) Why Real time operating systems are needed? Give some examples. [7]

3. Assume the following workload in a system. All jobs arrive at time 0 in the order given. [14]

Process	Burst Time	Priority
P1	30	High
P2	28	High
P3	04	Low
P4	16	Medium

   Draw a Gantt chart illustrating the execution of these jobs using Priority CPU scheduling algorithm and also Calculate the average waiting time and average turnaround time.

4. a) Consider the following page reference string: 1,2,4,7,3,5,6,3,6,1,4,2,3,6,5,2 How many page faults would occur for the LRU page replacement algorithm, assuming four frames and all frames are initially empty. [7]
   b) What is paging? Explain the hardware support given for paging [7]

5. a) Explain the usage and structure of monitors with an example [7]
   b) Write about Characterization of deadlock by resource allocation graph. [7]

6. a) Briefly explain about single-level, two-level and Tree-Structured directories. [7]
   b) Discuss in detail the file allocation techniques: Sequential, Indexed and Linked. [7]

7. a) Explain each and every component of the Android architecture with a neat sketch. [7]
   b) Discuss in detail about Android Runtime Application Development. [7]

Code No: **R164204C** **R16** **Set No. 4**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

OPERATING SYSTEMS

(Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) List out the types of System calls. [3]
   b) Define Interprocess Communication [3]
   c) Differentiate between Logical and Physical address space [2]
   d) What is Resource-Allocation-Graph? [2]
   e) Write short notes on File operations and types. [2]
   f) What is the Linux? Why it is used? [2]

PART–B *(4x14 = 56 Marks)*

2. a) Explain in detail about the functions of System Call Interface. [7]
   b) Discuss various challenges and issues that are to be considered while designing an operating system. [7]

3. a) Explain in detail, the sequence of actions taken by the operating system to context switch between processes. [7]
   b) How communication takes place in a shared-memory environment? Explain. [7]

4. a) Consider the following page reference string 2,3,4,5,3,2,6,7,3,2,3,4,1,7, 1,4,3,2,3,4,7. Calculate the number of page faults with LRU, FIFO and optimal page replacement algorithms with frame size of 3. [7]
   b) What is effective access time? Compute it for 70% hit ratio, 20 ns to search TLB and 100 ns to access memory. Observe the difference when it is changed to 90% hit ratio. [7]

5. a) Explain Banker's deadlock-avoidance algorithm with an illustration [7]
   b) What is semaphore? Why it is important? Suggest the solution for bounded buffer problem with semaphores. [7]

6. a) Consider a disk queue with following requests for I/O to blocks on cylinders 30,70,115,130.110,80,20,25 (Assume disk head is at 90) [7]
   Draw FCFS and SSTF scheduling and also determine how many times the disk head changes its direction for each of the above mentioned scheduling techniques.
   b) Give a brief note on Disk scheduling algorithms. [7]

7. a) Describe the components of LINUX system. [7]
   b) How Interrupts and Exceptions are handled in LINUX? Explain. [7]