



**NAVRACHANA
UNIVERSITY**
a UGC recognized University

School: School of Engineering and Technology
Program/s: BTech-IT
Year: 3rd **Semester:** 5th
Examination: End Semester Examination
Examination year: December - 2021

Course Code: IT314 **Course Name:** Kernel Programming
Date: 06/12/2021
Time: 8:30 am to 10:30 am

Total Marks: 40
Total Pages: 2

Instructions:

- Write each answer on a new page.
- Use of a calculator is not permitted.
- * COs=Course Outcome mapping. # BTL=Bloom's Taxonomy Level mapping

Q. No.	Details	Marks	COs*	BTL#
Q.1	Multiple Choice (Answer ALL). <p>I. The kernel is _____ of user threads. A. a part of B. the creator of C. unaware of D. None</p> <p>II. Which directory contains device files in Linux? A. /etc B. /bin C. /dev D. /root</p> <p>III. _____ is a computer process whose parent process has finished or terminated, though it remains running itself. A. An orphan process B. A zombie process C. A child process D. None</p> <p>IV. The range of Nice number in linux system is _____. A. -10 to +10 B. 0 to +10 C. -20 to +20 D. 0 to +20</p> <p>V. _____ function provides a read barrier. A. wmb B. read C. write D. rmb</p>	10X1=10	CO2 CO4 CO2 CO2 CO2	BT1 BT1 BT1, BT2 BT1 BT1

	<p>VI. Semaphore supports two atomic operations: P() and V(). In linux, the equivalent function of P() is _____.</p> <p>A. down() B. up() C. on() D. off()</p> <p>VII. The <i>dentry</i> is one of the main components of the common file model in virtual file system. (true/false)</p> <p>VIII. The default file system in linux is _____.</p> <p>A. inode B. ext2 C. etc D. ntfs</p> <p>IX. Symbolic link is one of the example of <i>inode</i> file type. (true/false)</p> <p>X. The kernel provides a representation of its model in userspace through the _____ virtual filesystem.</p> <p>A. sysfs B. sysrq C. softirq D. ext2</p>		C02	BT1, BT2
Q.2	<p>Fill in the blank (Answer ALL).</p> <p>I. One of the device model data structures is _____.</p> <p>II. _____ is a communication channel between the processor and an input/output device.</p> <p>III. On x86, it is possible to map 2M and even 1G pages using entries in the second and the third level page tables. Such pages are called _____ pages.</p> <p>IV. In linux, each zone is represented by _____ data structure in the mmzone.h file.</p> <p>V. In linux, processes with priorities (100-139) are _____ processes.</p>	5X1=5	C04 C04 C03 C03 C02	BT1, BT2 BT1 BT1 BT1, BT2 BT1
Q.3	<p>Answer any FIVE.</p> <p>I. Write a note on top-half and bottom-half in linux.</p> <p>II. What is deadlock? Explain self-deadlock. How can deadlock be prevented?</p> <p>III. Describe the Completely Fair Scheduler in linux.</p> <p>IV. Explain kobject structure in linux.</p> <p>V. Explain atomic operations with example.S</p> <p>VI. Differentiate between fork() and vfork().</p> <p>VII. Explain write cache policies in linux.</p>	5X5=25	C02 C03 C02 C04 C03 C02 C03	BT1, BT2 BT1, BT2 BT1 BT1, BT2 BT1, BT2, BT3 BT1, BT2 BT1, BT2

*****End of Question Paper*****