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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION - February 2022

B.Tech-IV Semester (CSE&IT)

COURSE CODE: 18B11CI411 MAX. MARKS: 15

COURSE NAME: Operating Systems

COURSE CREDITS: 3 MAX. TIME: 1 Hour

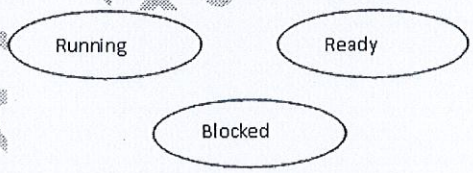
Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Marks are indicated against each question in square brackets.*

Q1. What is the main difficulty that a programmer must overcome in writing an operating system for a real-time environment? CO1 [2]

Q2. How does the distinction between kernel mode and user mode function as a very basic or simple form of protection (security)? CO1 [2]

Q3. How does a monolithic structure of an operating system differ from modular structure? Discuss advantages & disadvantages of both of these categories. CO1 [3]

Q4. In the following diagram illustrating the various states a process can be in, draw arrows connecting each pair of states that a preemptive *(preemption is the act of temporarily interrupting an executing task, with the intention of resuming it at a later time*) operating system may move a process between. Label each arrow with a brief description of a situation where the operating system would move the process as indicated in the figure given below. CO2 [3]



Q5. How many processes are generated by the following program code? Draw a tree showing the generation of parent-child processes. What is the output produced? CO2 [3]

```
int main()
{
    if (fork() && (!fork())) {
        if (fork() || fork()) {
            fork();
            }
        }
printf("2\n");
return 0;
}
```

`Q6. Discuss various programming challenges for multi-core systems. CO2 [2]