

CS/MCA/Odd/Sem-5th/MCAE-502A/2014-15

MCAE-502A

SYSTEM ADMINISTRATION AND LINUX

Time Allotted: 3 Hours

Full Marks: 70

*The questions are of equal value.
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)**

1. Answer *all* questions.

10×1 = 10

(i) Run Level 5 stands for

- | | |
|----------------------------------|--------------|
| (A) reboot | (B) shutdown |
| (C) multitasking with networking | (D) unused |

(ii) Ping works on which protocol?

- | | |
|----------|-------------------|
| (A) SMTP | (B) TFTP |
| (C) ICMP | (D) None of these |

(iii) The command chkconfig is used

- | | |
|----------------------------------|-----------------------------------|
| (A) to on a process at boot time | (B) to off a process at boot time |
| (C) both (A) and (B) | (D) none of these |

(iv) Which RAID level is used to stripe a file system?

- | | |
|------------|------------|
| (A) RAID 0 | (B) RAID 1 |
| (C) RAID 2 | (D) RAID 4 |

(v) Ifconfig eth0 down makes

- | | |
|---------------------------|---------------------|
| (A) lan card disable | (B) lan card enable |
| (C) lan card temp disable | (D) none of these |

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- (vi) What is the network id for the IP 192.168.74.254/28?
(A) 192.168.74.0 (B) 192.168.0.0
(C) 19.168.74.240 (D) none of these
- (vii) TCP is a protocol of
(A) Network Layer (B) Data Link Layer
(C) Physical Layer (D) Transport Layer
- (viii) The command which helps to check and configure network adapter is
(A) ifconfig (B) ipconfig
(C) netstat (D) none of these
- (ix) When a process makes a system call, its mode changes from
(A) user to kernel (B) kernel to user
(C) restricted to unrestricted (D) unrestricted to restricted
- (x) What is the output of the following program?

```
#include<stdio.h>
#include<fcntl.h>
main()
{
    int fd, count; char ch;
    fd=open("abc.txt",O_RDONLY);
    do{
        count=read(fd, &ch, 1);
        printf("%c", ch);
    }while(count);
}
```

- (A) it will print nothing (B) it will print the content of abc.txt
(C) segmentation fault (D) none of these

GROUP B
(Short Answer Type Questions)

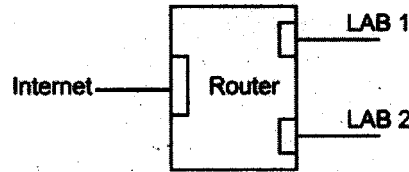
- Answer any *three* questions. 3×5 = 15
2. Describe the booting process in Linux 5
 3. Write a shell program to add a new user in the password with the following details: 5
Group name : "mca"
Login name : "wbut"
Default shell : bash
Expiry date : 12-Dec-2014
Comment : "End semester Exam"
 4. What is CGI? Define basic two types of CGI mechanism. 5
 5. Write a program to create a set of semaphores, and assign the first two's values as 2 and 3 respectively 5
 6. Write a Perl program to generate first 10 Fibonacci numbers. 5

GROUP C
(Long Answer Type Questions)

- Answer any *three* questions. 3×15 = 45
7. (a) Compare the advantages of IPC using socket over other methods. 2
(b) Describe (with the help of a diagram) how communication is established using socket for connection-oriented protocol. 5
(c) State the utility of each of the system calls mentioned in (b) 8
 8. (a) Explain the structure of message queue as maintained by kernel. 6
(b) Imagine we have a Linux based router that serves 2 different laboratories LAB1 and LAB2. The router has 3 Ethernet devices eth0, eth1, eth2. The eth0 device is connected to LAB1 (192.168.3.0/24) and eth1 device is connected to LAB2 (192.168.2.0/24). The eth2

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device has a public IP address and connects to the Internet.



The following table shows the interface addresses we will use in our example:

Ethernet Device	IP Address	Netmask
eth0	192.168.3.1	255.255.255.0
eth1	192.168.2.100	255.255.255.0
eth2	x.x.x.x	y.y.y.y

Write iptable rules to answer the following:

- (i) How much data each dependent generate on the Internet connection?
 - (ii) How much data travels between the 2 laboratories?
 - (c) Explain the different chains in the NAT table. 3
9. (a) Explain the usefulness and disadvantages of NAT. 5
- (b) Explain the significance of /etc/inittab and runlevels. 5
- (c) Explain the read, write and execute permissions on a file and directory. What is the significance of setting sticky bit on a direction and file. Give the command for setting and unsetting a sticky bit on a file. 5
- 10.(a) Explain IP forwarding and IP Masquerading. 2+4
- (b) Explain how a packet traverses through net filter engine in LINUX. 4
- (c) What is process priority? Explain how can we change the priority. What are the limitations of the command used? 5
11. (a) Why do we term FIFO as 'Named Pipe'? Give difference between FIFO and Pipe. Discuss the various functions/system calls used in establishing communication between any two arbitrary client and server processes. 2+2+4
- (b) Explain the significance of euid and egid. State how it becomes possible for an user to change his own password even though he might not have any write permission over configuration files. 3+4