



Name : .....  
Roll No. : .....  
Invigilator's Signature : .....

**CS/MCA/SEM-5/MCA-E-502A/2011-12**

**2011**

**SYSTEM ADMINISTRATION & LINUX**

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 )**

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

- i) Run Level 6 stands for
  - a) reboot
  - b) shutdown
  - c) multiple user mode
  - d) unused.
- ii) Ping works on which protocol ?
  - a) SMTP
  - b) TFTP
  - c) ICMP
  - d) none of these.



- iii) When a process is forked the child process inherits some properties. Which of the following properties are inherited ?
- a) The process code
  - b) All the defined program variables
  - c) The priority of the process
  - d) The stack.
- iv) Which RAID level is used to stripe a file system ?
- a) RAID 0
  - b) RAID 1
  - c) RAID 2
  - d) RAID 4.
- v) **dup** system call is used to duplicate
- a) file i-node
  - b) process id
  - c) file descriptor
  - d) permissions.
- vi) run level script is invoked by which script ?
- a) /etc/rc.d/rc.local
  - b) /etc/rc.d/rc
  - c) /etc/rc.d/rc
  - d) /etc/rc.d/rcs
- vii) What is the network id for the IP 192.168.74.250/28 ?
- a) 192.168.74.0
  - b) 192.168.0.0
  - c) 192.168.74.240
  - d) None of these.



viii) How to enable ipv4 forwarding ?

- a) `#ipforward-enable`
- b) `#echo 1>/proc/sys/net/ipv4/ip_forward`
- c) `#echo 0>/proc/sys/net/ipv4/ip_forward`
- d) both (a) and (b).

ix) TCP is a protocol of

- a) Network Layer
- b) Data Link Layer
- c) Physical Layer
- d) Transport Layer.

x) Which of the information is not stored in I-Node table ?

- a) Owner
- b) Group
- c) File size
- d) None of these.

xi) The command which helps to check and configure network adapter is

- a) `ifconfig`
- b) `ipconfig`
- c) `netstat`
- d) none of these.

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**GROUP – B**

**( Short Answer Type Questions )**

Answer any *three* of the following

3 × 5 = 15

2. Describe the booting process in Linux.
3. Write a shell program to add a new user in the password file with the following details :  
  
Group name : "mca"  
  
Login name : "wbut"  
  
Default shell : bash  
  
Expiry date : 12-Dec-2012  
  
Comment : "End semester exam"
4. Configure your host with the following information :
  - i) hostname wbutserver
  - ii) ip static 10.10.1.54 with subnet 255.255.252.0
  - iii) default route 10.10.0.1
5. What is an Internet Firewall ? How does it help in achieving security ? What are the limitations of firewall ? 1 + 2 + 2



6. Explain why the file /usr/bin/passwd has been SET-UID to root. What is shadow password ? 3 + 2

**GROUP - C**

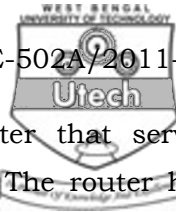
**( Long Answer Type Questions )**

Answer any *three* of the following. 3 × 15 = 45

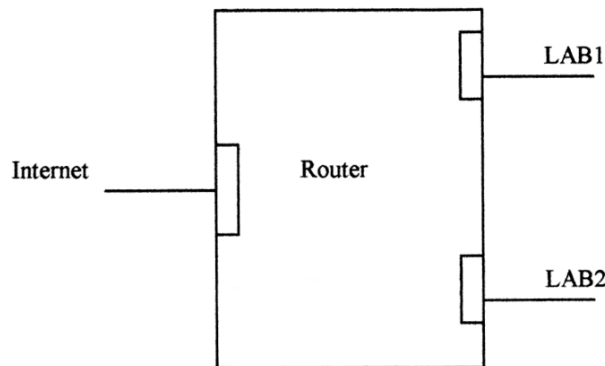
7. a) Write down the steps to configure a DNS server having name "mca.wbut.org".
- b) Set up a squid proxy server on your computer set up. Access your LAN on the 10.11.12.0/255.255.255.0 network. Assign appropriate value to acl, http\_access and visible host name makes sure it starts automatically the next time you reboot your computer. 8 + 7
8. a) What are the difference between orphan process and Zombie process.
- b) What is the difference between wait( ) and wait (0) ?
- c) Write a C program to print which users are currently logged in.
- d) What do you mean by message queue ? Create a named pipe for example.



- e) How can you create 1024 byte shared memory? Design a program when telephonic communication can be done using the created shared memory.  $2 + 2 + 3 + 3 + 5$
9. a) What are the different run levels of Linux ?  
b) How the root can block a user from login ?  
c) What is mounting of file system in Linux ?  
d) How can a window file system can be accessed through Linux ?  $4 + 3 + 4 + 4$
10. a) What is ftp ? How many types of ftp are there ?  
b) Write down the steps for configuring an anonymous ftp server and ftp a client.  
c) How do you upload and download a file from ftp the server ?  
d) How do you restrict root for accessing the ftp server ?  $3 + 6 + 4 + 2$
11. a) Explain the structure of message queue as maintained by kernel.



- b) Imagine we have a Linux based router that serves 2 different laboratories LAB1 & 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 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. 6 + 6 + 3

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