BACHELOR OF COMPUTER APPLICATIONS (BCA)

(Revised Syllabus)

BCA(Revised Syllabus)/ASSIGN/SEMESTER-VI

ASSIGNMENTS

(July - 2025 & January – 2026 sessions)

(BCS-062,MCS-022,BCSL-063)

SCHOOL OF COMPUTER AND INFORMATION SCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
MAIDAN GARHI, NEW DELHI – 110 068

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Important Notes

1. Submit your assignments to the Coordinator of your Study Centre on or before the due date.
2. Assignment submission before due dates is compulsory to become eligible for appearing in corresponding Term End Examinations. For further details, please refer to BCA Programme Guide.
3. To become eligible for appearing the Term End Practical Examination for the lab courses, it is essential to fulfill the minimum attendance requirements as well as submission of assignments (on or before the due date). For further details, please refer to the BCA Programme Guide.

Course Code	**:**	**BCS-062**
Course Title	**:**	**E-Commerce**
Assignment Number	**:**	**BCA(VI)062/Assignment/2025-26**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Date of Submission	**:**	**31st October, 2025 (For July, Session)**
		30th April, 2026 (For January, Session)

There are four questions in this assignment. Each question carries 20 marks. Rest 20 marks are for viva-voce. Answer all the questions. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

Q1:
Compare the strategic implications of adopting mCommerce versus eCommerce for a retail business entering tier-2 and rural markets in India. Focus your answer on customer behavior, technological infrastructure, mobile penetration, payment mechanisms, and localization strategies.

(20 Marks)

Q 2:
Analyze the economic and operational impact of replacing traditional B2B transactions with EDI-based systems in a supply chain. Go beyond the functional aspects of EDI and examine its influence on business agility, cost efficiency, workforce roles, and inter-organizational collaboration.

(20 Marks)

Q3:
Discuss how user behavior, regulatory requirements, and technology adoption have transformed online trading systems, and suggest whether traditional stock brokerage firms still have a viable future.

(20 Marks)

Q4:
Design a comprehensive checklist for evaluating the trustworthiness of an online auction website. *Base* your checklist on principles of consumer protection, transaction integrity, and dispute resolution mechanisms. Also, suggest improvements over existing global auction sites.

(20 Marks)

Course Code	**:**	**MCS-022**
Course Title	**:**	**Operating System Concepts and Networking Management**
Assignment Number	**:**	**BCA(VI)/022/Assignment/2025-26**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**31st October, 2025 (For July, Session)**
	:	**30th April, 2026 (For January, Session)**

Note: This assignment has eight questions for a total of 80 marks. Answer all the questions. The rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance the explanations. Answer of each part of the question should be confined to about 300 words.

Q1.

(a) Compare and contrast a Network Operating System (NOS) with a Distributed Operating System (DOS). Highlight their key differences in terms of resource management, user perception (transparency), and fault tolerance. Provide one example for each type of OS. **(5 Marks)**

(b) Explain the concept of a system call in an operating system. Describe the sequence of steps that occur when a user program makes a system call to read data from a file. Use a diagram to illustrate the transition between user mode and kernel mode. **(5 Marks)**

Q2.

(a) Consider a system with three processes (P1, P2, P3) and three resource types (R1, R2, R3). At a particular instance, the system state is as follows:

- Total instances of R1=10, R2=5, R3=7.

Process	Allocation (R1, R2, R3)	Max Need (R1, R2, R3)
P1	0, 1, 0	7, 5, 3
P2	2, 0, 0	3, 2, 2
P3	3, 0, 2	9, 0, 2

Using the Banker's Algorithm, determine:
(i) The content of the 'Available' and 'Need' matrices.
(ii) Is the system in a safe state? If yes, provide a safe sequence. Justify your answer.

(5 Marks)

(b) Differentiate between pre-emptive and non-pre-emptive scheduling algorithms. Provide one example for each and explain a scenario where one would be more suitable than the other. **(5 Marks)**

Q3.

(a) A system uses a paging memory management scheme with a page size of 4 KB. The logical address space of a process is 64 KB.
(i) How many pages are in the logical address?
(ii) If the physical memory size is 128 KB, how many frames are in the physical memory?

(iii) For the logical address 20500, calculate the page number and the offset.

(5 Marks)

(b) What is "thrashing" in the context of virtual memory? Explain why it occurs and describe two methods an operating system can use to prevent or handle thrashing. **(5 Marks)**

Q4.

(a) Explain the structure of an Inode in a Linux/UNIX file system. What key information does it store about a file? Why is the Inode-based approach efficient for managing file metadata? **(5 Marks)**

(b) Write a shell script in Linux that takes a directory name as a command-line argument. The script should count the number of files and sub-directories within the given directory and display the counts separately. It should also display an error message if the argument is not a valid directory. **(5 Marks)**

Q5.

(a) Describe the purpose and logical structure of Active Directory in a Windows Server environment. Explain the roles of a Domain, Tree, and Forest in organizing network resources. **(5 Marks)**

(b) Differentiate between a "workgroup" and a "domain" model in a Windows networking environment. List two advantages of using a domain model over a workgroup for a medium-sized organization.

(5 Marks)

Q6.

(a) Explain the step-by-step process of configuring a user's machine to obtain an IP address automatically from a DHCP server. Describe the four-step DORA (Discover, Offer, Request, Acknowledge) process.

(5 Marks)

(b) What is a DNS (Domain Name System) server? Differentiate between an authoritative DNS server and a caching DNS server. **(5 Marks)**

Q7.

(a) What is IPsec? Explain its two primary modes of operation: Transport Mode and Tunnel Mode. Use diagrams to illustrate how the packet structure changes in each mode. **(5 Marks)**

(b) What is EFS (Encrypting File System) in Windows? How does it provide security for files stored on a local disk?

(5 Marks)

Q8. Write short notes on the following: **(10 Marks)**

(a) The role of a RAID (Redundant Array of Independent Disks) system, specifically explaining RAID 0 and RAID 1.
(b) The concept of a Virtual Private Network (VPN) and its benefits.
(c) User and Group management in Linux, including the purpose of chown and chmod commands.
(d) The difference between a hub, a switch, and a router.

Course Code	**:**	**BCSL-063**
Course Title	**:**	**Operating System Networking Management Lab**
Assignment Number	**:**	**BCA(VI)/L-063/Assignment/2025-26**
Maximum Marks	**:**	**50**
Weightage	**:**	**25%**
Last date of Submission	**:**	**31st October, 2025 (For July, Session)**
	:	**30th April, 2026 (For January, Session)**

Note: This assignment has five questions for a total of 40 marks. The rest 10 marks are for viva voce. For each question, you must write the required shell script or provide a step-by-step procedure with screenshots. Attach all scripts and screenshots with your assignment.

Q1. Shell Scripting (Linux/UNIX)

(a) Write a shell script named backup.sh that performs the following tasks:

1. It should accept a source directory path and a destination directory path as command-line arguments.
2. It should check if the source directory exists. If not, it should print an error message and exit.
3. It should create a compressed backup of the source directory in the destination directory. The backup filename should be in the format backup_YYYY-MM-DD.tar.gz (e.g., backup_2025-10-25.tar.gz).
4. After a successful backup, it should print a message: "Backup of [source_directory] completed successfully at [destination_path/backup_filename]".

(b) Write another shell script named user_check.sh that takes a username as input. The script should check if the given user is currently logged into the system.

- If the user is logged in, it should display: "[Username] is currently active on the system."
- If the user is not logged in, it should display: "[Username] is not logged in."

(8 Marks)

Q2. Linux/UNIX System Administration

Perform the following system administration tasks. For each task, write the exact command(s) you would use and provide a brief explanation of what the command does.

(a) Create a new user account named intern with /home/intern as their home directory and /bin/bash as their default shell.
(b) Create a new group named devteam. Add the user intern and an existing user manager to this new group.
(c) a Create a directory named /project/data. Change its ownership so that the user manager is the owner and the group devteam is the group owner.
(d) Set the permissions for the /project/data directory such that:
* The owner (manager) has read, write, and execute permissions.
* Members of the devteam group have read and execute permissions only.
* Other users have no permissions at all.

(8 Marks)

Q3. Windows Server Administration

Provide a step-by-step procedure with screenshots for the following tasks in a Windows Server environment.

(a) Create and Configure a New User:

1. Open "Active Directory Users and Computers".
2. Create a new user with the following details:
    - Full Name: Riya Sharma
    - User logon name: riya.s
3. Set a password for the user and configure the account so that the "User must change password at next logon".
4. Add this new user to the "Marketing" group (assume the group already exists).

(b) Create a Shared Folder:

1. Create a new folder named MarketingReports on the C: drive.
2. Share this folder with the network name Marketing_Share.
3. Configure the share permissions so that the "Marketing" group has "Full Control".
4. Configure the NTFS permissions so that the "Marketing" group has "Modify" permissions, and the "Administrators" group has "Full Control".

(8 Marks)

Q4. Network Configuration and Services

Provide a step-by-step procedure with screenshots to perform the following network configurations.

(a) Configure a Static IP Address (Windows):
Configure a network adapter in Windows with the following static IP settings:

- IP Address: 192.168.1.50
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.1.1
- Preferred DNS Server: 8.8.8.8

(b) Install and Configure a Basic DHCP Server (Windows Server):

1. Install the DHCP Server role on your Windows Server.
2. Create a new IPv4 scope with the following details:
    - Scope Name: Office_Network
    - Start IP Address: 192.168.1.100
    - End IP Address: 192.168.1.200
    - Subnet Mask: 255.255.255.0
    - Router (Default Gateway): 192.168.1.1
    - DNS Server: 8.8.8.8
3. Activate the scope.

(8 Marks)

Q5. Linux/UNIX Command-Line Tasks

Write the single-line command to perform each of the following tasks in a Linux/UNIX terminal.

(a) Find and display all lines in the file /var/log/syslog that contain the word "error" (case-insensitive).
(b) List all running processes on the system and find the Process ID (PID) of the apache2 process.
(c) Create a symbolic link named webapp in your home directory that points to /var/www/html.
(d) Display the disk space usage of all mounted file systems in a human-readable format (e.g., KB, MB, GB).
(e) Schedule a job using cron to run the script /home/user/maintenance.sh at 2:00 AM every Sunday.

(8 Marks)