BACHELOR OF COMPUTER APPLICATIONS
(BCA)

(Revised Syllabus)

ASSIGNMENTS

(July - 2021 & January - 2022)

BCS-011   **BCS-012**

BCSL-013

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

CONTENTS

Course Code	Assignment No.	Submission-Schedule		Page No.
		For July-December Session	**For January-June Session**	
BCA-011	BCA(1)-011/Assignment/21-22	31st October, 2021	15th April, 2022	5
BCS-012	BCA(1)-012/Assignment/21-22	31st October, 2021	15th April, 2022	9
BCSL-013	BCA(1)L-013/Assignment/21-22	31st October, 2021	15th April, 2022	11

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	:	FEG-02
Course Title	:	English
Assignment Number	:	BCA (1)/02/Assignment/2021-22
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	31st October, 2021 (For July Session)
	:	15th April, 2022 (For January Session)

Here is the web-link of assignment: https://webservices.ignou.ac.in/assignments/soh/Feg.htm

Course Code	:	**ECO-01**
Course Title	:	**Business Organization**
Assignment Number	:	**BCA (1)/01/Assignment/2021-22**
Maximum Marks	:	**100**
Weightage	:	**25%**
Last Dates for Submission	:	**31st October, 2021 (For July Session)**
	:	**15th April, 2022 (For January Session)**

Here is the web-link of assignment https://webservices.ignou.ac.in/assignments/bcom.htm

Course Code	:	BCS-011
Course Title	:	Computer Basics and PC Software
Assignment Number	:	BCA (1)/011/Assignment/2021-22
Maximum Marks	:	100
Last Date of Submission	:	31ˢᵗ October, 2021 (For July Session)
		15ᵗʰ April, 2022 (For January Session)

This assignment has three questions of 80 marks. Answer all the questions. Rest 20 marks are for viva voce. You may use illustrations and diagrams to enhance explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation. Please give precise answers. The word limit for each part is 200 words.

Q1: (Covers Block 1)   **(7×4=28 Marks)**

a) Explain the functioning of a computer system? What is the role of each component of a computer? How does computer is able to execute an instruction? What is an integrated circuit? Explain

b) What are the different codes that can be used to represent a character in a computer? Explain the purpose of use of ASCII and UNICODE with a help of examples for each. Explain how ASCII decimal digits are different from the binary numbers.

c) Convert the following numbers as directed
   (i) Decimal 257.125 into binary and hexadecimal
   (ii) Decimal 65465 into binary and hexadecimal
   (iii) String "Different Codes of 0, 1, till 9" to ASCII and Unicode strings
   (iv) Hexadecimal ABCD09F8 to decimal and binary

d) Explain the memory hierarchy with the help of a diagram. Compare and contrast the features of primary memory with cache memory.

e) Why does a computer system have a hard disk? Which of the two – magnetic disk or optical disk has smaller access time? Give reason in support of your answer. How is the access time on a magnetic disk computed? Explain with the help of an example.

f) Compare and contrast the following technologies:
   (i) Serial port and SCSI
   (ii) Digitizing tablet and Keyboard
   (iii) Scanner and Bar code reader
   (iv) CRT and LED displays

g) Explain the characteristics/functions of the following in the context of a computer system:

      (i) Desktop computers

      (ii) List of the component of Motherboard of a computer

      (iii) Data compression

      (iv) My Computer and Recycle Bin

Q2: (Covers Block 2) (7×4=28 Marks)

a) What are the key features of cloud computing? What are the benefits of using cloud computing? How is N tier client-server architecture different from cloud computing architecture?

b) Explain the structured and modular design paradigm of programming language with the help of an example. Using the same example, explain how object-oriented programming is different from the modular programming.

c) Define the basic functions of the following software:

      (i) Server Programs

      (ii) Database management software

      (iii) Device drivers

      (iv) Anti-virus software

d) List the functions of the following in the context of Operating System

      (i) Process management

      (ii) Concurrent Processing on a single processor system

      (iii) Memory Management

      (iv) File Management

      (v) Batch Processing

      (vi) Key features of Unix

e) Draw a flow chart and write an algorithm for problem: Find the sum of all three digit even numbers. (Hint: These numbers are 100, 102, …998. You must use looping).

f) Explain the meaning and output of each line of the following program segment. How many times the loop at (ii) and (iii) will be executed?

      (i) int n = 4;

             int i, outpt=1;

      (ii) for (i=1; i<=n; i++)

           {

      (iii) output = outpt * i;

           }

      (iv) printf ("The final value is %d ", outpt);

g) Identify the software or type of software that will be required for the following situations. Also, explain the steps that would be performed to solve the situation in question, if applicable.

    (i) A software maintenance company plans to deploy its staff on various client sites. It creates an expected list of tasks that are to be performed at each client site, expected time that would be taken to complete those tasks and number of persons needed to complete those tasks. Which software would help the company in planning of such deployment of staff?

    (ii) You are writing a report on a work completed by you. This report is expected to be about 50 page long and would consists of large number of headings and sub-headings. You are required to create the table of content and an index of key terms in the report. Identify which software and what features of that software would be used by you. Explain these features.

    (iii) You are head of a sales team, which records monthly sales targets of each sales employee and the amount of actual sales made by the employees. This data is analyzed and suitable graphs are created to highlight individual and overall performance of a team. Identify the software suitable for the company and the features of the software that would be needed to create graphs.

    (iv) You are required to set up a communication environment for an organization in which a group of employees are informed about specific information, such as meeting date, meeting agenda, notes etc. The communication can be initiated by any employee of the organization and is stored with a subject. What kind of software will you use for such work?

Q3: (Covers Block 3)   (6×4=24 Marks)

(a) How does the use of computer networks ensure high reliability and scalability? Also explain the following terms in the context of computer networks:

    (i) Noise and attenuation

    (ii) Half Duplex transmission

    (iii)Twisted pair cable

    (iv)Microwave transmission

(b) What is meant by the term network topology? Consider that you have a central server system on which all your data is recorded, which network topology would be preferred by you? Justify your answer. Also explain the characteristics of Wide Area Networks (WAN). Explain an application for which you need to use a WAN.

(c) Explain the characteristics of the following networking devices:

    (i) Hub

    (ii) Switches

    (iii)Router

    (iv)Gateway

(d) What is the need of DNS? Explain with the help of an example. What is subnet mask? Where and how can it be used? Explain with the help of an example.

(e) What is a browser? What are its features? Explain how can a browser be used for searching of information on the Internet? Write the search term, when you want to search for Universities who offer Engineering Programmes but do not offer Science Programmes.

(f) Explain the following in the context of Internet and its applications:
  (i) Electronic Educational Resources
  (ii) E-learning

Course Code	:	BCS-012
Course Title	:	Basic Mathematics
Assignment Number	:	BCA(1)012/Assignment/2021-22
Maximum Marks	:	100
Weightage	:	25%
Last Date of Submission	:	31st October, 2021 (For July Session)
		15th April, 2022 (For January Session)

Note: This assignment has 20 questions of 80 marks (each question carries equal marks). Answer all the questions. Rest 20 marks are for viva voce. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

Q1: Use the principle of mathematical induction to show that **(4 Marks)**
$2 + 2^2 + ... + 2^n = 2^{n+1} - 2$ for every natural number n.

Q2: Find the sum of all integers between 100 and 1000 which are divisible **(4 Marks)**
by 9.

Q3: Reduce the matrix A(given below) to normal form and hence find its **(4 Marks)**
rank.

$$A = \begin{bmatrix} 5 & 3 & 8 \\ 0 & 1 & 1 \\ 0 & 1 & 1 \end{bmatrix}$$

Q4: Show that n(n+1) (2n+1) is a multiple of 6 for every natural number n. **(4 Marks)**

Q5: Find the sum of an infinite G.P. whose first term is 28 and fourth term **(4 Marks)**
is $\frac{4}{49}$.

Q6: Check the continuity of the function f(x) at x = 0 : **(4 Marks)**

$$f(x) = \begin{cases} \frac{|x|}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$$

Q7: If $y = \frac{\ln x}{x}$, show that $\frac{d^2y}{dx^2} = \frac{2\ln x - 3}{x^3}$ **(4 Marks)**

Q8: If the mid-points of the consecutive sides of a quadrilateral are joined, **(4 Marks)**
then show (by using vectors) that they form a parallelogram.

Q9: Solve the equation $2x^3 - 15x^2 + 37x - 30 = 0$, given that the roots of the **(4 Marks)**
equation are in A.P.

Q10: A young child is flying a kite which is at height of 50 m. The wind is **(4 Marks)**
carrying the kite horizontally away from the child at a speed of 6.5 m/s.

How fast must the kite string be let out when the string is 130m ?

Q11: Using first derivative test, find the local maxima and minima of the **(4 Marks)**
function $f(x) = x^3 - 12x$.

Q12: Evaluate the integral $I = \int \frac{x^2}{(x+1)^3} dx$ **(4 Marks)**

Q13: Find the scalar component of projection of the vector $\vec{a} = 2\hat{i} + 3\hat{j} + 5\hat{k}$ **(4 Marks)**
on the vector $\vec{b} = 2\hat{i} - 2\hat{j} - \hat{k}$.

Q14: If 1, ω, $\omega 2$ are cube roots unity, show that $(2-\omega)(2-\omega^2)(2-\omega^{10})$ **(4 Marks)**
$(2-\omega^{11}) = 49$.

Q15: Find the length of the curve $y = 3 + \frac{x}{2}$ from (0, 3) to (2, 4). **(4 Marks)**

Q16: Evaluate the determinant given below, where ω is a cube root of unity. **(4 Marks)**

$$\begin{vmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{vmatrix}$$

Q17: Using determinant, find the area of the triangle whose vertices are **(4 Marks)**
$(-3, 5), (3, -6)$ and $(7, 2)$.

Q18: Solve the following system of linear equations using Cramer's rule: **(4 Marks)**
$$x + y = 0, \ y + z = 1, \ z + x = 3$$

Q19: If $A = \begin{bmatrix} 1 & -2 \\ 2 & -1 \end{bmatrix}$, $B = \begin{bmatrix} a & 1 \\ b & -1 \end{bmatrix}$ and $(A + B)^2 = A^2 + B^2$, Find a and b. **(4 Marks)**

Q20: Use De Moivre's theorem to find $(\sqrt{3} + i)^3$. **(4 Marks)**

Course Code	:	BCSL-013
Course Title	:	Computer Basics and PC Software
Assignment Number	:	BCA(1)/L-013/Assignment/2021-22
Maximum Marks	:	100
Weightage	:	25%
Last date of Submission	:	31st October, 2021(For July Session)
	:	15th April, 2022 (For January Session)

Answer all the questions in the assignment which carry 80 marks in total. Rest 20 marks are for viva voce. 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. Make suitable assumption if necessary

Section I: Linux

Q1: **(a)** Execute the following Linux commands and write its output. **(6 Marks)**

(i) date   (ii) history   (iii) find   (iv) head   (v) grep   (vi) du

(b) Write commands to execute the following tasks: **(4 Marks)**

(i) Examine files and displays whether the file contains data, text etc.
(ii) Show one line summary of system status.
(iii) Find out free space on disk.

(c) **(i)** Display the last 10 lines of a file. **(2 Marks)**
(ii) List all the files stored in /sbin. **(2 Marks)**
(iii) Write all the steps to add extra RAMs. **(2 Marks)**

Section II: Power point

Q2: Create a Power Point Presentation on the important features of Windows OS (minimum 10 slides) **(16 Marks)**

(i) All slides should follow the common design format
(ii) Add a video to at least one slide which can be run on full screen option
(iii) All the slides should have timer based transition.
(iv) All the slides should have perform heading and slide notes.
(v) Each slide should have one image related to Windows operating system.

Create the following formulas using superscript and subscript features. **(4 Marks)**
$A_5 B^6 C_7$

Section III: Spreadsheet

Q3: Below are the details of percentage increase of prices of certain products. You are required to create a spreadsheet in approximate format for the sample labels and data and create a formula for a new price. Place the heading of the spreadsheet as "Increased cost of products" at the centre. **(16 Marks)**

Increased cost of products

Product code	Existing cost (₹)	to Increase	Revised Price (₹)
P1	7000.00	20%	-
P2	9000.00	25%	-
P3	12000.00	30%	-
P4	5000.00	10%	-
P5	6000.00	26%	-

Section IV: Power Point

Q4: Create a power point presentation, which should include the following details. **(12 Marks)**

- All the slides should have proper heading and should have slide notes.
- Except the first slide, all the remaining slides should have common format.
- There should be a sound effect while moving from one slide to another slide.
- Add a video to at least one slide which can be run in play full screen option.

Section V: Outlook

Q5: As a lab instructor you are required to reschedule your practical classes on BCSL-013. You are required to fix time slots for every batch, book a lab and other resource and inform students and counselor through an email.

(i) Write all the options available in outlook to fulfill the scenario above. **(6 Marks)**

(ii) Collaborate online (in-a group) through Google Docs or Yahoo group to create a presentation on mobile OS. All the groups should work on the presentation simultaneously from their respective computers. **(10 Marks)**