

MASTER OF COMPUTER APPLICATIONS (MCA_NEW)

**ASSIGNMENTS
OF MCA_NEW (2Yrs) PROGRAMME
SEMESTER-I**

(January - 2024 & July - 2024)

MCS-211, MCS-212, MCS-213, MCS-214, MCS-215

MCSL-216, MCSL-217



**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 Programme Guide of MCA (2Yrs).
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 Programme Guide of MCA (2yrs).
4. The viva voce is compulsory for the assignments. For any course, if a student submitted the assignment and not attended the viva-voce, then the assignment is treated as not successfully completed and would be marked as ZERO.

Course Code	:	MCS-211
Course Title	:	Design and Analysis of Algorithm
Assignment Number	:	MCA_NEW(1)/211/Assign/2024
Maximum Marks	:	100
Weightage	:	30%
Last Dates for Submission	:	30th April 2024 (for January Session) 31st October 2024 (for July Session)

This assignment has four questions (80 Marks). Answer all questions. Rest 20 marks are for your 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 the presentation.

- Q1:**
- Develop an efficient algorithm to find a list of prime numbers from 100 to 1000. **(2 Marks)**
 - Differentiate between Polynomial-time and exponential-time algorithms. Give an example of one problem each for these two running times. **(2 Marks)**
 - Using Horner's rule, evaluate the polynomial $p(x) = 2x^5 - 5x^4 - 3x^2 + 15$ at $x=2$. Analyse the computation time required for polynomial evaluation using Horner's rule against the Brute force method. **(2 Marks)**
 - State and explain the theorems for computing the bounds O , Ω and Θ . Apply these theorem to find the O -notation, Ω -notation and Θ -notation for the function: $f(n) = 10n^3 + 18n^2 + 1$ **(4 Marks)**
 - Explain binary exponentiation for computing the value 5^{19} . Write the right-to-left binary exponentiation algorithm and show its working for the exponentiation 5^{19} . Also, find the worst-case complexity of this algorithm. **(4 Marks)**
 - Write and explain the linear search algorithm and discuss its best and worst-case time complexity. Show the working of the linear search algorithm for the data: 12, 11, 3, 9, 15, 20, 18, 19, 13, 8, 2, 1, 16. **(4 Marks)**
 - What is a recurrence relation? Solve the following recurrence relations using the Master's method **(2 Marks)**
 - $T(n) = 8T\left(\frac{n}{2}\right) + n^2$
 - $T(n) = T\left(\frac{3n}{4}\right) + 1$

- Q2:**
- What is a Greedy Approach to Problem-solving? Formulate the fractional Knapsack Problem as an optimisation problem and write a greedy algorithm to solve this problem. Solve the following fractional Knapsack problem using this algorithm. Show all the steps. **(4 Marks)**

Suppose there is a knapsack of capacity 15 Kg and 6 items are to packed in it. The weight and profit of the items are as under:

$$(p_1, p_2, \dots, p_6) = (3, 2, 4, 5, 1, 6)$$

$$(w_1, w_2, \dots, w_6) = (2, 1, 2, 1, 5, 1)$$

- What is the purpose of using Huffman Codes? Explain the steps of building a huffman tree. Design the Huffman codes for the following set of characters and **(4 Marks)**

their frequencies: a:15, e:19, s:5, d:6, f:4, g:7, h:8, t:10.

- c) Explain the Partition procedure of the Quick Sort algorithm. Use this procedure and quick sort algorithm to sort the following array of size 8: [12, 9, 17, 15, 23, 19, 16, 24]. Compute the worst case and best case complexity of Quick sort algorithm. **(4 Marks)**
- d) Explain the divide and conquer approach of multiplying two matrices of large size. Also, explain the Strassen's matrix multiplication algorithm. Find the time complexity of both these approaches. **(4 Marks)**
- e) What is the use of Topological sorting? Write and explain the Topological sorting algorithm. Also, compute the time complexity for the topological sorting algorithm. **(4 Marks)**

Q3: Consider the following Graph:

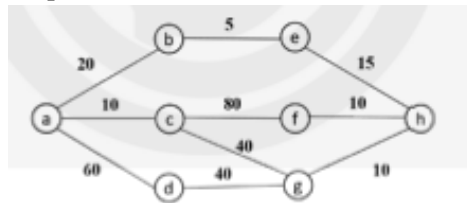


Figure 1: Graph for Problem 3(a) and 3(b)

- a) Write the Kruskal's algorithm and Prim's algorithm to find the minimum cost spanning tree of the graph given in Figure 1. Show all the steps of computation. Also, compute the time complexity of both the algorithms. **(4 Marks)**
- b) In the Figure 1, find the shortest path from the vertex 'a' using Dijkstra's shortest path algorithm. Show all the steps of computation. Also, find the time complexity of the algorithm. **(4 Marks)**
- c) What is dynamic programming? What is the principle of Optimality? Use the dynamic programming approach to find the optimal sequence of chain multiplication of the following matrices: **(6 Marks)**

Matrix	Dimension
A1	5 × 10
A2	10 × 20
A3	20 × 15
A4	15 × 8
A5	8 × 10

- d) Make all the possible Binary Search Trees for the key values 25, 50, 75. **(2 Marks)**
- e) Explain the Knuth Morris Pratt algorithm for string matching. Use this algorithm to find a pattern "algo" in the Text "From algae to algorithms". Show all the steps. What is the time complexity of this algorithm. **(4 Marks)**

- Q4:**
- a) What are decision problems and Optimisation problems? Differentiate the decision problems and Optimisation problems with the help of at least two problem statements of each. **(4 Marks)**
 - b) Define P and NP class of Problems with the help of examples. How are P class of problem different from NP class of Problems. **(4 Marks)**

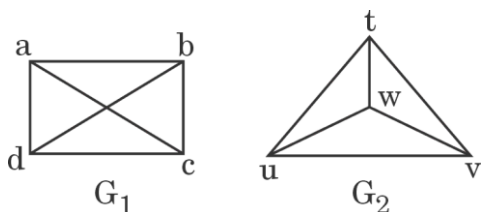
c) What are NP-Hard and NP-Complete problem? What is the role of reduction? **(4 Marks)**
Explain with the help of an example.

d) Define the following Problems: **(8 Marks)**
(i) 3-CNF SAT
(ii) Clique problem
(iii) Vertex cover problem
(iv) Graph Colouring Problem

Course Code	:	MCS-212
Course Title	:	Discrete Mathematics
Assignment Number	:	MCA_NEW(1)/212/Assign/2024
Maximum Marks	:	100
Weightage	:	30%
Last Dates for Submission	:	30thApril 2024 (for January Session) 31st October 2024 (for July Session)

This assignment has 20 questions of 80 Marks. Answer all questions. Each question carries 4 marks. 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.

- Q1:** Use Mathematical Induction to prove that : $1^2 + 2^2 + \dots + n^2 = n(n+1)(2n+1)/6$
- Q2:** How many different permutations are possible of the letters, taken all at a time, of the word: ASSESSES?
- Q3:** A die is rolled once. What are the probabilities of the following events:
- Getting an odd number
 - Getting at least a value 2
 - Getting at most a value 2
 - Getting at least 7
- Q4:** Draw a hypercube graph Q_3 (also called the cubical hypercube). Check whether the hypercube Q_3 is Hamiltonian
- Q5:** What is isomorphism? Find, if the following graphs G_1 and G_2 are isomorphic or not. Explain how you arrived at your answer.



- Q6:** What is a finite automata ? Why is it needed? How is a finite automata represented?. Also explain the term regular expression with the help of an example.
- Q7:** Differentiate between
- Deterministic and Non-deterministic finite automata
 - Deterministic and Non-deterministic Turing Machine
 - Moore and Mealy Machine
- Q8:** Describe the divide-and-conquer approach to solve recurrences ? Explain how this approach can be used to apply binary search in a sorted list.
- Q9:** What is proposition ? Explain with the help of an example. Explain Disjunction and Conjunction with the help of truth table for each.

Q10: Prove the following theorem by direct proof method: “The square of an even integer is an even integer.”

Q11: Given the Boolean expression $(a' \vee (b \wedge c')) \vee (b \vee d')$, draw the corresponding circuit, where a, b, c and d are the inputs to the circuitry.

Q12: Define the terms Domain, Co-domain and Range in the context of a function. Also find the domain, co-domain and range for a function A to B, where $A=\{1,2,3,4\}$ and $B=\{1,4,9,16,25\}$.

Q13: A committee consisting of 2 male and 2 female workers is to be constituted from 8 male and 9 female workers. In how many distinct ways can this be done ?

Q14: In a tennis tournament, each entrant plays a match in the first round. Next, all winners from the first round play a second-round match. Winners continue to move on to the next round, until finally only one player is left as the tournament winner. Assuming that tournaments always involve $n = 2^k$ players, for some k, find the recurrence relation for the number rounds in a tournament of n players.

Q15: Show, using the pigeonhole principle, that in any group of 30 people, 5 people can always be found who were born on the same day of the week.

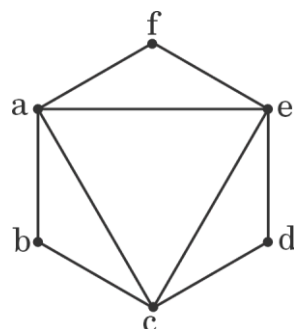
Q16: Define the following in the context of graph, with the help of an example :

- a. Complete graph
- b. Degree of a vertex
- c. Cycle
- d. Path
- e. Circuit

Q17: What is a bipartite graph ? Explain with the help of an example. Give one or two applications of bipartite graphs.

Q18: How Hamiltonian graphs differ from the Eulerian graphs? Give Dirac’s and Ore’s criterion for the Hamiltonian graphs.

Q19: Differentiate between Eulerian graph and Eulerian circuit. Find the Eulerian circuit in the graph given below (if it exists).



Q20: Write Short notes on following

- a. Travelling Salesman Problem
- b. Vertex Coloring
- c. Edge Coloring
- d. Planar graphs
- e. Pascal's Formula

Course Code	:	MCS-213
Course Title	:	Software Engineering
Assignment Number	:	MCA_NEW(1)/213/Assign/2024
Maximum Marks	:	100
Weightage	:	40%
Last Dates for Submission	:	30th April 2024 (for January Session) 31st October 2024 (for July Session)

This assignment has one question for 80 marks. 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.

Q1:

Assume that you are assigned responsibility of developing an **Online Admit Card Generation System (OACGS)** for a University. **OACGS** should run both on PCs and Mobile Devices. **OACGS** will have all fields such as Student's name, Student's Address, Examination Center Code and Address, Examination Center Superintendent Name, Examination Center e-mail address and Mobile Number, Aadhaar Number, Course Codes and Titles in whom the student is permitted for appearing in exams along with dates and timings of respective exams, Color image of the student etc. The student will apply for examinations online by filling examination form. The validity of the data entered by the student shall be authenticated online and **OACGS** consisting of the above mentioned information needs to be generated. Make assumptions wherever necessary.

For developing **OACGS** as specified above,

- (a) Which SDLC paradigm will be selected. You may also suggest a SDLC paradigm that is proposed by you and non-existent as on date. Justify your answer. **(10 Marks)**
- (b) List the functional and non-functional requirements. **(10 Marks)**
- (c) Estimate cost. **(15 Marks)**
- (d) Estimate effort. **(15 Marks)**
- (e) Develop SRS using IEEE format. **(15 Marks)**
- (f) List queries for whom Reports can be generated **(5 Marks)**
- (g) List specific requirements which enables **OACGS** to run on both PCs and Mobile Devices **(10 Marks)**

Course Code	:	MCS-214
Course Title	:	Professional Skills and Ethics
Assignment Number	:	MCA_NEW(1)/214/Assign/2024
Maximum Marks	:	100
Weightage	:	30%
Last date of Submission	:	30th April 2024 (for January session) 31st October 2024 (for July session)

This assignment has *nine* questions. Answer all 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:

Read the following passage and answer the questions given below:

MEETINGS

Do you ever feel as though you spend all your time in meetings?

Henry Mintzberg, in his book *The Nature of Managerial Work*, found that in large organizations managers spent 22 per cent of their time at their desk, 6 per cent on the telephone, 3 per cent on other activities, but a whopping 69 per cent in meetings. There is a widely held but mistaken belief that meetings are for “solving problems” and “making decisions”. For a start, the number of people attending a meeting tends to be inversely proportional to their collective ability to reach conclusions and make decisions. And these are the least important elements.

Instead hours are devoted to side issues, playing elaborate games with one another. It seems, therefore, that meetings serve some purpose other than just making decisions. All meetings have one thing in common: role-playing. The most formal role is that of chairman. He (and it is usually a he) sets the agendas, and a good chairman will keep the meeting running on time and to the point. Sadly, the other, informal, role-players are often able to gain the upper hand. Chief is the “constant talker”, who just loves to hear his or her own voice.

Then there are the “can’t do” types who want to maintain the status quo. Since they have often been in the organisation for a long time, they frequently quote historical experience as a ploy to block change: “It won’t work, we tried that in 1984 and it was a disaster”. A more subtle version of the “can’t do” type, the “yes, but...”, has emerged recently. They have learnt about the need to sound positive, but they still can’t bear to have things change.

Another whole-sub-set of characters are people who love meetings and want them to continue until 5.30 p.m or beyond. Irrelevant issues are their speciality. They need to call or attend meetings, either to avoid work, or to justify their lack of performance, or simply because they do not have enough to do.

Then there are the “counter-dependents”, those who usually disagree with everything that is said, particularly if it comes from the chairman or through consensus from the group. These people need to fight authority in whatever form.

Meetings can also provide attenders with a sense of identification of their status and power.

A popular game is pinching someone else’s suggestions. This is where someone, usually junior or female, makes an interesting suggestion early in the meeting, which is not picked up. Much later, the game is played, usually by some more senior figure that propounds the idea as his own. The suggestion is of course identified with the player rather the initiator.

Because so many meeting ends in confusion and without a decision, another more common game is played at the end of meetings, called reaching a false consensus. Since it is important for the chairman to appear successful in problem-solving and making a decision, the group reaches a false consensus. Everyone is happy, having spent their time productively. The reality is that the decision is so ambiguous that it is never acted upon, or, if it is, there is continuing conflict, for which another meeting is necessary.

In the end, meetings provide the opportunity for social intercourse, to engage in battle in front of our bosses, to avoid unpleasant or unsatisfying work, to highlight our social status and identity. They are, in fact, a necessary though not necessarily productive psychological sideshow. Perhaps it is our civilized way of moderating, if not preventing, change.

Answer the following questions:

- i) What is the purpose of a meeting according to the writer? **(3 Marks)**
- ii) The “can’t do” type wants to maintain a status grow. Elaborate. **(2 Marks)**
- iii) What does devoted to side-issues” mean in this context? **(2 Marks)**
- iv) What is the position in the organization of those who steal others’ ideas? How do they do it? **(3 Marks)**
- v) What does the “counter-dependents” mean? **(2 Marks)**
- vi) Complete the following table: **(8 Marks)**

	People	Role at Meetings
1		Keep the meeting running on time & to the point
2		
3	Can’t Do type	
4		Sound positive but resist change
5	Role-Players/Attendees	
6	Chairman	

Q2: Write a telephone conversation on the basis of cues given below: (10 Marks)

- A: Ask to speak to Mr. Andrew (*Hint: May I speak to.....?*)
- B: He’s in a meeting
- A: Ask when he’ll be free
- B: You don’t know. Offer to find out
- A: Say you’ll wait
- B: He won’t be free till after 6 p.m.
- A: You want him to call you first thing tomorrow.
- B: Find out caller’s name and number.
- A: Give your (real) name and number
- B: Note down the information and say you’ll leave the message on his desk
- A: Say thanks and goodbye.

Q3: Write short notes on any four of the following: (20 Marks)

- i) Significance of Minutes of the meeting.
- ii) Interpersonal Skill of a Manager in an Organization.
- iii) Do’s and Don’ts during Meetings.
- iv) Importance of Visuals in Presentations.
- v) Do’s and Don’ts on Social Media.

Q4: You work for a company, which manufactures external hard disks and pen drives. You are visiting another company, “Ajitech”, to buy some accounting software for your finance department. They have expressed an interest in your company’s external hard disks and pen-drives. You would like to take twenty brochures and three sample external hard disks and pen-drives with you. (10 Marks)

- Write a memo to Mr. John, the stores manager.
- Ask for his permission to take these items.
- Explain the time and date when you want to collect them.
- Say what you hope to achieve by showcasing these products.

Q5: Read the advertisement below and write your Curriculum Vitae on the basis of it.

(10 Marks)

Printer Sales Executives (South Delhi)
For a
Leading Multinational Company

We are looking for young, dynamic males/females interested in selling various types of Printers.

The position is based in Delhi and the candidates will be responsible for sales in Punjab, Uttar Pradesh, Haryana and Uttaranchal.

No experience required but working knowledge of Printers is essential.

Remuneration is comparable with the best in the industry, and will be linked to performance.

Apply to Ms. Anuradha
Personal Executive
ABC Co.(Pvt) Ltd
P.O. Box: 3675

Q6: Fill in the blanks with suitable prepositions:

(5 Marks)

Last year, The Indian Trade Fair 2023 was held.....the Bharat Mandapam, Pragathi Maidan, DelhiNovember 10.....20. The fair was organized by the Trade Fair Authority of India(TFAI). The fair, was open.....11 a.m.9 p.m.all the days for Public.

It was an all India fair. Traders and Manufactures.....all the states participatedit. The aim of the fair was to bring together the buyers and sellers of goods manufactured.....different parts of India and promote trade and industry.....the country.

Q7: These are the answers to ten questions. Write the *Wh-* questions.

(10 Marks)

Example: Who does Rahul for?

Rahul works for JTN.

- i) He is the Marketing Director.
- ii) There are five Directors at JTN.
- iii) He lives in Mumbai.
- iv) He starts work at 8.30 a.m.
- v) Next week he's going to a trade fair in Abudhabi.
- vi) He joined the company six years ago.
- vii) He has been Marketing Director since 2017.
- viii) Before joining JTN, he worked for FANTASTECH India.
- ix) He was with them for seven years.
- x) He left because of a misunderstanding.

- Q8:** Prepare a presentation *on any one* of the following: **(10 Marks)**
- i) Presentation on any Software MNC (or else the company where you work)
 - ii) Any hardware (latest) product
 - iii) A software project you have been involved in recently
 - iv) Emerging Technologies in your working area.

Before you begin, indicate:

- i) you and audience
- ii) who they are
- iii) if it's a formal or informal occasion.

Indicate any props you may need, *e.g.*, White board, Overhead projector, Power point, etc. The presentation must be in about 200 words.

- Q9:** Prepare minutes for an official meeting that was held in XYZ company (*or in your company where you are working*) to discuss the Quarterly Sales Report of a Product and future plans to promote it further. **(5 Marks)**

Course Code	:	MCS-215
Course Title	:	Security and Cyber Laws
Assignment Number	:	MCA_NEW(1)/215/Assign/2024
Maximum Marks	:	100
Weightage	:	30%
Last date of Submission	:	30thApril 2024 (for January session) 31stOctober2024 (for July session)

This assignment has two questions. Answer all questions. The remaining 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 the presentation.

Q1: (3x4= 12 Marks)

- (a) What are the three pillars of digital security? What is the need for digital security?
- (b) Explain the following in the context of security issues/attacks:
 - (i) DDoS attacks
 - (ii) Malware
 - (iii) Crypto-jacking
- (c) Explain the term Cyber Security intrusion detection with the help of an example.
- (d) What are the laws related to unauthorised access and web jacking?

Q2: Explain the following terms with the help of an example of each. (3x6=18 Marks)

- (a) Function-based substitution cypher
- (b) Five Key Functions of Cryptography
- (c) Steganography
- (d) RSA algorithm
- (e) Hash functions
- (f) Pseudo-random number generator

Q3: (3x4= 12 Marks)

- (a) List practices for implementing the CIA triad in data security.
- (b) Explain the following:
 - (i) Phishing attacks.
 - (ii) Ransomware attacks
 - (iii) State-sponsored attacks
- (c) Explain the six principles of security management.
- (d) Explain the terms – (i) Security audit (ii) Security and usability.

Q4: (3x4= 12 Marks)

- (a) Why is there a need to regulate cyberspace? Explain, giving reasons.
- (b) Explain the role of filtering devices and rating scales in regulating Internet content.
- (c) What is the UNCITRAL model law? Explain its doctrines and parts.
- (d) What are the international initiatives for the regulation of cyberspace?

Q5: (3x5= 15 Marks)

- (a) Explain the classification of cybercrimes with the help of examples.
- (b) How is Computer Contaminant defined under Section 43 of the Information Technology Act 2000?
- (c) List any six offences, as per the Information Technology Act, 2000.
- (d) What are the Liabilities of network service providers? Explain.
- (e) Explain the term cyber forensics.

Q6:

(6+3+2= 11 Marks)

- (a) Explain the following forms of IPR and related regulatory framework:
- (i) Copyrights and related rights.
 - (ii) Patents
 - (iii) Trademarks
- (b) What is meant by the terms - linking, in-linking and framing in the context of IPR?
- (c) What are domain name disputes? Explain with the help of an example.

Course Code : **MCSL-216**
Course Title : **DAA and Web Design Lab Assignment**
Number : **MCA_NEW(1)/L-216/Assign/2024**
Maximum Marks : **100**
Weightage : **30%**
Last Dates for Submission : **30thApril 2024 (for January session)**
31stOctober2024 (for July session)

This assignment has two sections. Answer all questions in each section. Each Section is of 20 marks. Your Lab Records will carry 40 Marks (20 Marks for each section). 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.

Note: You must execute the program and submit the program logic, sample input and output along with the necessary documentation. Assumptions can be made wherever necessary.

Section-1

Q1: Implement the task scheduling algorithm on your system to minimize the total amount of time spent in the system for the following problem: **(10 Marks)**

- Job 1 5 2 10
- Service Time 3 7 4 8

Q2: Implement a recursive binary search algorithm on your system to search for a number 100 in the following array of integers: **(10 Marks)**

10 35 40 45 50 55 60 65 70 100

Show the processes step by step. Also, Draw recursive calls to be made in this problem

Section-2

Q1: Design a form for booking a room in the Hostel through an institutional website **(20 Marks)**

The form should have the following fields:

First Name	<input style="width: 100%;" type="text"/>
Last Name	<input style="width: 100%;" type="text"/>
email	<input style="width: 100%;" type="text"/>
Arrival Date	<input style="width: 100%;" type="text"/>
Departure Date	<input style="width: 100%;" type="text"/>
Country	<input style="width: 100%;" type="text" value="Select"/> ▼
Payment mode	Debit card Credit card <input type="radio"/> <input type="radio"/>
	<input style="width: 50px; height: 20px;" type="button" value="Submit"/> <input style="width: 50px; height: 20px;" type="button" value="Reset"/>

- Use Java script to validate all the fields.
- Submit button should enter all the fields' data to the database.
- Error message should be shown if a text field is left blank.
- Reset button resets all the fields to the blank.
- Design a check box for selecting a payment mode.
- Design a drop down list for selecting a country field.

Course Code	:	MCSL-217
Course Title	:	Software Engineering Lab
Assignment Number	:	MCA_NEW(1)/217/Assign/2024
Maximum Marks	:	100
Weightage	:	40%
Last Dates for Submission	:	30thApril 2024 (for January session) 31stOctober 2024 (for July session)

This assignment has one question for 80 marks. 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.

Q1:

ABC is a University which is having Learner Support Centers (LSCs) across the World. It also had Regional Centers (RCs) across the World. ABC also includes many departments which offer various programmes. However, not all LSCs offer all the Programmes. Counseling sessions normally take place during weekends. Minimum attendance of 75% is essential in Practical Counseling Sessions. Every LSC is having a Code. Every RC is having a code. Every Department is having a Code. Every Programme is having a Code. Every Course is having a Code. Any person who takes admission to any of the Programmes is also having an enrollment number. All codes and enrollment number are unique. Semester End Examinations are held at designated Examination Centers and every Examination Center is having a code. Every students is assigned to a LSC where he attends counseling sessions. A student can seek transfer from one LSC to another.

Now, with reference to the above, answer the following:

- (1) List the Entities **(20 Marks)**
- (2) For each Entity, list Attributes **(20 Marks)**
- (3) Define relationships between the Entities **(20 Marks)**
- (4) Finally, draw the Entity Relationship Diagram **(20 Marks)**