

# **BACHELOR OF COMPUTER APPLICATIONS (BCA\_NEWOL)**

BCA\_NEWOL /ASSIGN/SEMESTER-II

## **ASSIGNMENTS**

**(January - 2026 & July - 2026)**

**FEG-02, MCS-202, MCS-203, MCSL-204, MCS-201, MCSL-205,**



**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 through the Learning Management System (LMS) 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\_NEWOL Programme Guide.
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<b>Course Code</b>	:	<b>FEG-02</b>
<b>Course Title</b>	:	<b>English</b>
<b>Assignment Number</b>	:	<b>BCA_NEWOL (II)/02/Assignment/2026</b>
<b>Maximum Marks</b>	:	<b>100</b>
<b>Weightage</b>	:	<b>25%</b>
<b>Last Dates for Submission</b>	:	<b>30<sup>th</sup> April, 2026 (For January Session)</b> <b>31<sup>st</sup> October 2026 (For July Session)</b>

**There are six questions in this assignment which carried 100 marks. Answer all the questions. Please go through the guidelines regarding assignments given in the Program Guide for the format of presentation.**

**Q1:** Read the following passage and make notes in an appropriate format: **(15 Marks)**

One day a wonderful plate made of gold fell from Heaven into the court of a temple at Benares; and on the plate these words were inscribed; "A gift from Heaven to him who loves best." The priests at once made a proclamation that every day at twelve o'clock, all who would like to claim the plate should assemble at the temple, to have their kind deeds judged.

Every day for a whole year all kinds of holy men, hermits, scholars and nobles came, and related to the priests their deeds of charity, and the priests in solemn council heard their claims. At last they decided that the one who seemed to be the greatest lover of mankind was a rich man who had that very year given all his wealth to the poor. So they gave him the plate of gold, but when he took it in his hand, it turned to worthless, lead; though, when he dropped it in his amazement on to the floor, it became gold again. For another year claimants came; and the priests awarded the prize three times. But the same thing happened, showing that Heaven did not consider these men worthy of the gift. Meanwhile a large number of beggars came and lay about the temple gate, hoping that the claimants who came would give them alms to prove they were worthy of the golden plate. It was a good time for the beggars, because the pilgrims gave them plenty of money; but they gave them no sympathy, nor even a look of pity. At last a simple peasant, who had heard nothing about the plate of gold, came; and he was so touched by the sight of the miserable beggars, that he wept; and when, he saw a poor blind and maimed wretch at the temple gate, he knelt at his side and took his maimed hands in his and comforted him with kind words. When this peasant came to the temple, he was shocked to find it full of men boasting of their kind deeds and quarrelling with the priest. One priest, who held the golden plate in his hand, seeing the peasant standing there, beckoned to him; and the peasant came, and knowing nothing about the plate, took it in his hands. At once it shone out with three times its former splendour, and the priests said: "Son, the gift is yours : for you love best."

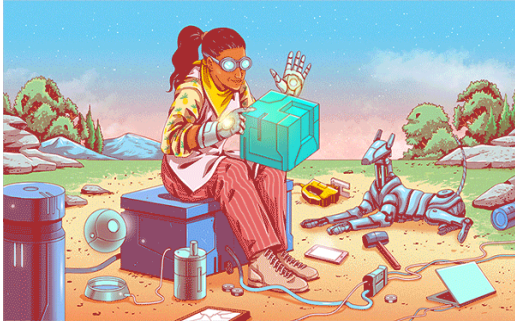
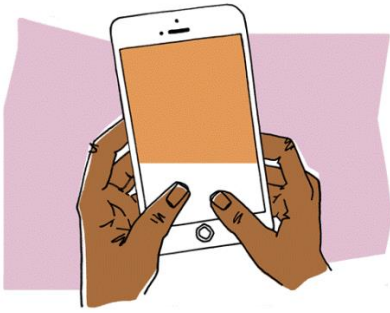
**Q2:** Write a summary of the passage and give it an appropriate title. **(15 Marks)**

**Q3:** Write a paragraph of 100-150 words on any one of the following topics: **(10 Marks)**  
a) The use of AI                      b) Online Education

**Q4:** You are the Secretary of the Students Union in your college. Write a report in 250 words of a meeting held to discuss how to hold a Stand-up comedy show in the college. **(20 Marks)**

**Q5:** Write a report in 250 words of an interview you had with the education minister of your state. **(20 Marks)**

**Q6:** Write a composition of 250-300 words based on any **one** of the pictures given below: **(20 Marks)**



# **POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS**

**(PGDCA\_NEW)**

**PGDCA\_NEW/ASSIGN/SEMESTER-I**

**ASSIGNMENTS**

**(January – 2026 & July – 2026)**

**MCS-201, MCS-202, MCS-203, MCSL-204, MCSL-205**



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<b>Course Code</b>	:	<b>MCS-201</b>
<b>Course Title</b>	:	<b>Programming in C and PYTHON</b>
<b>Assignment Number</b>	:	<b>PGDCA_NEW(I)/201/Assignment/2026</b>
<b>Maximum Marks</b>	:	<b>100</b>
<b>Weightage</b>	:	<b>30%</b>
<b>Last Date of Submission</b>	:	<b>30<sup>th</sup> April, 2026 (for January session) 31<sup>st</sup> October, 2026 (for July session)</b>

There are ten questions in this assignment which carries 80 marks. Each question carries 8 marks. Rest 20 marks are for viva-voce. Answer all the questions from both the sections i.e. Section A and Section B. You may use illustrations and diagrams to enhance the explanations. Include the screen layouts also along with your assignment responses. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

### **SECTION-A (C-Programming)**

**Question 1:** Write an algorithm, draw a flow chart and write its corresponding C program to convert a decimal number to its equivalent Binary number. **(8 Marks)**

**Question 2:** Write an algorithm and its corresponding C program to generate students' Progress-Report for VIII standard (section of 20 students) of a CBSE school for all its 4 terms. Use Structures concept. Assumptions can be made wherever necessary. **(8 Marks)**

**Question 3:** Write a C program to generate the following pattern: **(8 Marks)**

```

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

```

**Question 4:** Write a C program to perform the following operation on matrices  $D = A + (B * C)$ , where A, B and C are matrices of (3 X 3) size and D is the resultant matrix. **(8 Marks)**

**Question 5:** Write a C program to take a list of N numbers, separate even and odd numbers and put them in two appropriate files (evenfile and oddfile). Use File Handling concept. **(8 Marks)**

### **SECTION-B (PYTHON-Programming)**

**Question 6:** Write a program in Python to check if a given year (entered by user) is a leap year or not, support your programme with suitable comments to improve readability **(8 Marks)**

**Question 7:** Write a program to prompt for a score between 0.0 and 1.0. If the score is out of range, print an error. If the score is between 0.0 and 1.0, print a grade using the following table **(8 Marks)**

Score	Grade
$\geq 0.9$	A
$\geq 0.8$	B
$\geq 0.7$	C
$\geq 0.6$	D
$< 0.6$	F

**Question 8:** Write a programme in Python to create a package named Area and create 3 module in it named – square, circle and rectangle each having a function to calculate area of square, circle and rectangle respectively. Import the module in separate location and use the functions. **(8 Marks)**

**Question 9:** Write a program in Python to perform following: **(8 Marks)**

- To find cube of numbers in a list using lambda function.
- To display frequency of each word in a file.
- To display first n lines from a file, where n is given by user.
- To display size of a file in bytes

**Question 10:** What are Co-routines? How Co-routines support cooperative multi-tasking in python? How Co-routines differ from threads? Compare Subroutines and Co-routines. **(8 Marks)**

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**PGDCA\_NEW/ASSIGN/SEMESTER-I**

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**MCS-201, MCS-202, MCS-203, MCSL-204, MCSL-205**



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<b>Course Code</b>	:	<b>MCS-202</b>
<b>Course Title</b>	:	<b>Computer Organisation</b>
<b>Assignment Number</b>	:	<b>PGDCA_NEW(I)/202/Assignment/2026</b>
<b>Maximum Marks</b>	:	<b>100</b>
<b>Weightage</b>	:	<b>30%</b>
<b>Last Dates for Submission</b>	:	<b>30<sup>th</sup> April, 2026 (for January session)</b> <b>31<sup>st</sup> October, 2026 (for July session)</b>

**There are four questions in this assignment, which carries 80 marks. 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 presentation format. The answer to each part of the question should be confined to about 300 words. Make suitable assumptions, if any.**

**Question 1:** (covers Block1) **(2 marks each × 10 parts =20 Marks)**

- (a) Explain the von Neumann architecture with the help of a diagram. Also, explain how the data and instructions are stored in this architecture.
- (b) Explain how a computer will execute the following high-level language program segment:
 

```
int x=10, y=20, result;
result=x+y;
```
- (c) Perform the following conversion of numbers:
  - (i) Decimal  $(1479865320)_{10}$  to binary and hexadecimal.
  - (ii) Hexadecimal  $(BCDAFD01)_h$  to binary and Octal.
  - (iii) ASCII String “BCA Programme Code is BCA\_NEW & BCA\_NEWOL” to UTF-8
  - (iv) Octal  $(72143065)_o$  to Decimal
- (d) Simplify the following function using a K-map:  $F(A, B, C, D) = \Sigma (1,3, 4, 5, 7, 11, 12)$ . Draw the circuit for the simplified function using NAND gates.
- (e) Consider the Adder-Subtractor circuit given in Unit 3 of Block 1. Explain how this circuit will perform subtraction (A-B) if the value of A is 1001 and B is 0111. You must list all the bit values, including  $C_{in}$ ,  $C_{out}$ , and the overflow condition.
- (f) Make the Truth Table and draw the logic diagram of a 3×8 decoder. Explain its functioning with the help of a truth table and an example input.
- (g) Assume that a source data value 1011 was received at a destination as 0011. Show how Hamming's Error-Correcting code will be appended to the source data, so this one-bit error is identified and corrected at the destination. You may assume that the transmission error occurs in the source data and not in the error correction code.
- (h) Explain the functioning of the RS flip-flop with the help of a logic diagram and a characteristic table. Also, make and explain the excitation table of this flip-flop.

- (i) Explain the functioning of a synchronous counter.
- (j) Represent  $(-729.25)_{10}$  and  $(0.0078125)_{10}$  in IEEE 754 single precision format.

**Question 2:** (covers Block 2)

**(4 marks each × 5 parts =20 Marks)**

- (a) (i) Explain the structure of a  $4 \times 2$  ROM with the help of a diagram. (ii) How many memory chips of size  $128K \times 8$ bits are needed to build a RAM of size 64 M words if the word size of RAM is 32 bits? (iii) Find the storage capacity of a Magnetic disk with 16 recording surfaces, and 256 tracks consisting of 256 sectors each. You may assume that each sector can store 1 MB of data. (iv) Find the rotational latency of a disk that rotates at 9000 rpm.
- (b) Consider that the main memory of a computer is 256 words (assume a memory word to be 32 bits). The cache memory of this computer consists of 8 blocks, each 128 bits in size. Find the cache addresses for the main memory addresses  $01100011_2$  and  $11010111_2$  for the following cache mapping schemes:
  - (i) Associative cache mapping
  - (ii) Direct cache mapping
  - (iii) Two-way set associative cache mapping
- (c) Explain the steps of a Direct Memory Access (DMA) transfer. What are the advantages of using the DMA technique of data transfer? Illustrate the DMA breakpoints in an instruction cycle with the help of a diagram.
- (d) What is an interrupt? Explain the steps of interrupt processing with the help of a diagram. Explain the design issues for implementing interrupt-driven Input/Output (I/O).
- (e) Explain the features of the following I/O Technologies:
  - (i) Active-Matrix Liquid Crystal Displays
  - (ii) Colour Depth in the context of Video cards
  - (iii) Scanners
  - (iv) Non-impact printers

**Question 3:** (Covers Block 3)

**(4 marks each × 5 parts =20 Marks)**

- (a) Explain the functioning of subroutine call and return instructions with the help of an example. Also, explain indirect addressing, indexed addressing, and stack addressing with the help of an example for each.
- (b) Demonstrate how the size of a machine program changes for the computation of the expression **result=(a+b) \* (a\*b+c)** when the instruction sets have (i) zero address instructions, (ii) one address instructions, (iii) two address instructions, and (iv) three address instructions.
- (c) Consider a machine that uses PC, IR, AC, and MAR registers to execute different instructions. All the memory accesses during instruction execution bring data to a temporary register named TR. The ALU of the machine performs the subtraction operation using the AC and TR registers, and the result of the subtraction operation is stored in the AC register. List and explain all the microoperations required to execute the following machine instruction:  
 $AC \leftarrow AC -M$ ; where M is the address of a direct operand in the Memory  
 Assume that PC is currently pointing to this instruction.  
 Make and state suitable assumptions, if any.

- (d) Explain the operation of a micro-programmed control unit with the help of a diagram.
- (e) What are the features of a RISC machine? Explain the RISC pipelining with the help of a diagram.

**Question 4:** (Covers Block 4)

**(5 marks each × 4 parts =20 Marks)**

- (a) What is a Flag register in the 8086 microprocessor? Explain any four flags and their use. What is the need for a segment register in the 8086 microprocessor? Compute the physical address for the following {Segment Register : Offset} pairs in an 8086 microprocessor:
  - (i) CS: IP = ABCD<sub>h</sub>:AAFF<sub>h</sub>
  - (ii) DS:BX = 1FBH<sub>h</sub>:99FF<sub>h</sub>
  - (iii) SS: SP = EFFF<sub>h</sub>: 00AB<sub>h</sub>
- (b) What is an Interrupt Vector Table (IVT) in the 8086 microprocessor? Explain its use with the help of a diagram. Write a program using 8086 assembly language to input a string: “Welcome to the Programme.”
- (c) Write a program in 8086 assembly language that converts a 4-bit unsigned binary number to an equivalent unpacked BCD value. For example, the input binary number 1101<sub>2</sub> is first converted to its equivalent BCD value, 13, i.e., 00010011<sub>2</sub>. This value is then unpacked and stored as unpacked BCD values, 00000001<sub>2</sub> and 00000011<sub>2</sub>. Explain the algorithm of the program.
- (d) Explain the features and advantages of the following:
  - (i) Pipeline for adding two floating-point numbers
  - (ii) Vector Processing
  - (iii) Bus interconnection structure in a multiprocessor system
  - (iv) Multi-core processors
  - (v) Inter-processor communication and synchronisation

# **POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS**

**(PGDCA\_NEW)**

**PGDCA\_NEW/ASSIGN/SEMESTER-I**

**ASSIGNMENTS**

**(January – 2026 & July – 2026)**

**MCS-201, MCS-202, MCS-203, MCSL-204, MCSL-205**



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**Course Code** : MCS-203  
**Course Title** : Operating Systems  
**Assignment Number** : PGDCA\_NEW(I)/203/Assignment/2026  
**Maximum Marks** : 100  
**Weightage** : 30%  
**Last Date of Submission** : 30<sup>th</sup> April, 2026 (for January session)  
 31<sup>st</sup> October, 2026 (for July session)

**This assignment has four questions. Answer all questions. Each question is of 20 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.**

**Question 1:**

Consider the following jobs.

Job#	Arrival time	Run time
A	0	2
B	2	3
C	3	1
D	5	6

- Using the **FCFS** method, compute the completion times of the above jobs, average turn around time and average waiting time.
- Using the **SRTF** (Shortest Remaining Time first) method, compute the completion times of the above jobs, the average turn around time and the average waiting time. Note that SRTF is SJF with preemption. (Hint: Completion time - arrival time = turnaround time).
- Using the Round Robin method (with Quantum = 2), compute the completion times of the above jobs and the average waiting time.

**(20 Marks)**

**Question 2:**

- Explain the Banker's problem. Consider the following snapshot of a system:

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
<b>P0</b>	0	0	1	2	0	0	1	2	1	5	2	0
<b>P1</b>	1	0	0	0	1	7	5	0				
<b>P2</b>	1	3	5	4	2	3	5	6				
<b>P3</b>	0	6	3	2	0	6	5	2				
<b>P4</b>	0	0	1	4	0	6	5	6				

Answer the following questions using Banker's algorithm:

- i. What is the content of the matrix need?
  - ii. Is the system in a safe state?
  - iii. If a request from P1 arrives for (0, 4, 2, 0), can the request be granted immediately?
- (10 Marks)**
- b. Consider the following page-reference string:  
1, 2, 3, 4, 2, 1, 3, 4, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 4

How many page faults would occur for following replacement algorithms assuming one, two, three, four, five, six or seven frames? Remember that all frames are initially empty, so your first unique pages will all cost one fault each.

- i. LRU replacement.
  - ii. FIFO replacement.
  - iii. Optimal replacement.
- (10 Marks)**

### Question 3:

- a. Multiprocessor systems aim to improve both throughput and application speedup, yet these objectives often conflict with each other. Critically analyze how processor scheduling policies and task allocation strategies in multiprocessor operating systems attempt to balance this trade-off. Illustrate your answer with suitable scenarios where prioritizing one objective adversely affects the other.  
**(10 Marks)**
- b. Different multiprocessor interconnection architectures (bus-oriented, crossbar, hypercube, and multistage switch-based systems) exhibit varying scalability and contention characteristics. Compare these architectures from the perspective of scalability, cost, fault tolerance, and communication overhead, and justify which architecture would be most suitable for large-scale parallel applications.  
**(10 Marks)**

### Question 4:

- a. Modern operating systems increasingly rely on virtual memory techniques to balance performance and resource utilization. Using Windows 10 and Linux as reference case studies, examine how demand paging, working sets, page caching, and memory compression contribute to efficient memory management. Evaluate the trade-offs involved when physical memory is constrained, and discuss how these strategies influence application performance.  
**(10 Marks)**
- b. File system design plays a crucial role in data integrity, performance, and security. Drawing from the case studies on Windows (NTFS) and Linux file systems, discuss how directory organization, file metadata handling, access control, and storage management differ in philosophy and implementation. Assess how these differences affect scalability, fault tolerance, and system administration in enterprise environments.  
**(10 Marks)**

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<b>Course Code</b>	:	<b>MCSL-204</b>
<b>Course Title</b>	:	<b>WINDOWS and LINUX Lab Assignment</b>
<b>Number</b>	:	<b>PGDCA_NEW(I)/L-204/Lab_Assignment/2026</b>
<b>Maximum Marks</b>	:	<b>100</b>
<b>Weightage</b>	:	<b>30%</b>
<b>Last Dates for Submission</b>	:	<b>30<sup>th</sup> April, 2026 (for January session)</b> <b>31<sup>st</sup> October, 2026 (for July session)</b>

**The assignment has two parts A and B. Answer all the questions. Each part is for 20 marks. WINDOWS and LINUX lab record carries 40 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 PGDCA Programme Guide for the format of presentation. If any assumptions made, please state them.**

### **PART-I: Windows 10**

**Question 1:** For Windows 10, write the step-by-step procedure for the following along with the screenshots are execution for each:

- i. To create a new user account in Windows 10 and change it from a standard user to an administrator.
- ii. To customize the Windows 10 desktop by changing the background, theme, and taskbar settings.
- iii. To create, rename, copy, move, and delete files and folders using File Explorer.
- iv. To install an application from the Microsoft Store and uninstall it using Windows Settings.
- v. To view running processes and end a task using the Windows 10 Task Manager.
- vi. To configure and use Remote Desktop to connect to another computer.
- vii. To check disk usage and perform Disk Cleanup in Windows 10.
- viii. To enable Windows Defender and perform a quick virus scan.
- ix. To create a backup of files and restore a previous version in Windows 10.
- x. To use Command Prompt to check the IP configuration and network connectivity.

**(10 X 2= 20 Marks)**

### **PART-II: LINUX**

**Question 1:**

Write the LINUX commands for the following:

- i. To list all files (including hidden files) in long format and redirect the output to a file named details.txt.
- ii. To find all .txt files in the current directory and its subdirectories and display their absolute paths.
- iii. To change file permissions so that the owner has read, write, and execute permissions, the group has read and execute permissions, and others have only read permission.
- iv. To display the top five processes consuming the highest CPU using appropriate process-related commands.
- v. To search for the word IGNOU in all text files of the current directory, ignoring case sensitivity.

**(5 Marks)**

**Question 2:**

- i. Write a shell script to accept a filename as input and display the number of lines, words, and characters in the file.
- ii. Write a shell script to accept two numbers from the user and display the largest number using conditional statements.
- iii. Write a shell script to read a directory name and list all files having read permission for the user.
- iv. Write a shell script to display the sum of first n natural numbers using a loop, where n is entered by the user.
- v. Write a shell script to accept a string from the user and check whether it is a palindrome.

**(5 X 3 = 15 Marks)**

# **POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS**

**(PGDCA\_NEW)**

**PGDCA\_NEW/ASSIGN/SEMESTER-I**

**ASSIGNMENTS**

**(January – 2026 & July – 2026)**

**MCS-201, MCS-202, MCS-203, MCSL-204, MCSL-205**



**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 PGDCA\_NEW 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 PGDCA\_NEW Programme Guide.
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.

<b>Course Code</b>	:	<b>MCSL-205</b>
<b>Course Title</b>	:	<b>C and PYTHON Lab.</b>
<b>Assignment Number</b>	:	<b>PGDCA_NEW(I)/L-205/Lab_Assignment/2026</b>
<b>Maximum Marks</b>	:	<b>100</b>
<b>Weightage</b>	:	<b>30%</b>
<b>Last Date of Submission</b>	:	<b>30<sup>th</sup> April, 2026 (for January session) 31<sup>st</sup> October, 2026 (for July session)</b>

**There are two questions in this assignment carrying a total of 40 marks. Your Lab Record will carry 40 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. Submit the screenshots along with the coding and documentation.**

### **Section 1: C Programming Lab**

**Question 1:** Using Structures write an interactive program in C language to create an application program for a small office to maintain the employee's database. This application should be having menu options like **(20 Marks)**

- Creating a New Record
- Reading/Listing of Records
- Modify the record
- Delete the record

Each employee record should have Employee Name, Employee ID, Department Name, Salary, Position, Date of Joining, etc.). The application should be designed user-friendly.

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

### **Section 2: PYTHON Programming Lab**

**Question 2: Attempt the following**

- I) Write Program to perform following tasks **(10 Marks)****
- a. Create a database SELECTION\_DB
  - b. Set connection with mysql.connector.connect.
  - c. Create a table EMP\_SELECTION in database SELECTION\_DB with following data FIRST\_NAME, LAST\_NAME, AGE, GENDER, INCOME.
  - d. change table structure / (add, edit, remove column of a table) at run time
    - i. add a column address in the EMP\_SELECTION table.
    - ii. execute SQL *INSERT* statement to create a record into EMP\_SELECTION table
    - iii. run the query to updates all the records having GENDER as 'M', and increase AGE of all the males by one year.
    - iv. delete all the records from EMP\_SELECTION Table where AGE is less than 18.

- II)** Write a python code to read a dataset (may be CSV file) and print all features i.e. columns of the dataset. Determine the descriptive statistics i.e. Maximum, Minimum Mean Median, Count, Variance, Standard Deviation etc. of the numeric features like age, salary etc., may be present in the dataset. **(10 Marks)**

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