

BACHELOR OF COMPUTER APPLICATIONS (BCA)

(Revised Syllabus)

BCA(Revised Syllabus)/ASSIGN/SEMESTER-II

ASSIGNMENTS

(July - 2018 & January - 2019)

MCS-011, MCS-012, MCS-015, MCS-013, BCSL-021, BCSL-022,



**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 : **MCS-011**
Course Title : **Problem Solving and Programming**
Assignment Number : **MCA(2)/011/Assignment/2018-19**
Maximum Marks : **100**
Weightage : **25%**
Last Date of Submission : **15th October, 2018 (for July, 2018 batch)**
15th April, 2019(for January, 2019 batch)

There are eight questions in this assignment which carries 80 marks. Each question carries 10 marks. Rest 20 marks are for viva-voce. Answer all the questions. 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.

Question1: Write an algorithm, draw a flow chart and write its corresponding C program to convert a decimal number to its equivalent hexadecimal number. (10 Marks)

Question2: 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. (10 Marks)

Question 3: Write a C program to generate the following pattern: (10 Marks)

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

Question 4: Write a program to generate Fibonacci series using Recursion. (10 Marks)

Question 5: 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. (10 Marks)

Question 6: Write an interactive C program to calculate the string length of a given string, using pointers. (10 Marks)

Question 7: 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. (10 Marks)

Question 8: Write an interactive C program for each to illustrate the following concepts: (10 Marks)
(a) Enumerated data type (b) Macros in C (c) typedef (d) Goto statement (e) Break statement

Course Code	:	MCS-012
Course Title	:	Computer Organisation and Assembly Language Programming
Assignment Number	:	BCA(2)/012/Assignment/2018-19
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	15th October, 2018 (For July, 2018 Session) 15st April, 2019 (For January, 2019 Session)

There are four questions in this assignment, which carries 80 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. Answer to each part of the question should be confined to about 300 words. Make suitable assumption, if any.

Question 1 (Covers Block 1)

- (a) What are fixed point numbers in a computer system? Why are negative fixed point numbers represented in complement form? Give examples of fixed point numbers (positive as well as negative) assuming the size of the notation to be 8 bits (including sign bit).

Perform the following arithmetic operations using signed 2's complement 8 bit representation. (Please note that the numbers given below are in decimal notation)

- i) Add -30 and -98
- ii) Subtract -79 from 45

Please indicate overflow if it occurs. Explain how have you identified the overflow? (2 Marks)

- (b) Perform the following conversion of numbers:

- i) Decimal $(56789123)_{10}$ to binary and hexadecimal
- ii) Hexadecimal $(ABCDEF0)_H$ into Octal.
- iii) ASCII string "Subject: Computer %\$ Sc." into UTF 8 string
- iv) Octal $(345123)_O$ into Decimal

(2 Mark)

- (c) Design a circuit for the following function:

$$F(A, B, C, D) = \sum (2,3,4, 5, 10, 11, 12, 13)$$

Draw the truth table. Use the Karnaugh's map to design the circuit and draw it using AND, OR and NOT gates. (4 Marks)

- (d) What is the need of a parity bit? Explain with the help of an example. How many parity bits are needed to detect and correct a single bit error in a 8-bit data? Explain the process of correction of Single bit error with the help of an example which is not from your Unit. (4 Marks)

- (e) Design a two bit down counter (a sequential circuit). The counter states are 11, 10, 01, 00, 11, 10, 01, 00, 11... You should show the state table, state diagram, the k-map for circuit design and logic diagram of the resultant design using D flip-flop or J-K flip flop. (4 Marks)

- (f) What is floating point number? What is the difference between Single precision and double precision floating point numbers? What is a representation for Zero in IEEE 754 single precision standard. Represent $(-23456.05)_{10}$ and $(0.00025)_{10}$ in IEEE 754 single precision format. (4 Marks)

Question 2 (Covers Block 2)

- (a) A RAM has 1M rows each having 16 cells:
- (i) How many data input and data output lines does this RAM needs? Explain your answer.
 - (ii) What is the capacity of RAM in bytes.
 - (iii) How many address lines are needed for this RAM? Give reason in support of your answer. (2 Marks)
- (b) A computer has 1 MB RAM and has a word size of 16 bits. It has cache memory having 8 blocks having a block size of 32 bits. Show how the main memory address 0001 1001 1110 1101 0001 will be mapped to cache address, if
- (i) Direct cache mapping is used
 - (ii) Associative cache mapping is used
 - (iii) Two way set associative cache mapping is used. (4 Marks)
- (c) What is the need of DMA in a Computer? How is DMA different than that of Interrupt driven I/O technique? Assume that a new computer supports few bytes of input from multiple user's, which of the three I/O techniques is most suitable for this computer? Justify your answer. (4 Marks)
- (d) Assume that a disk has 1000 tracks with each track having 64 sectors and each sector is of size 512 K. A file having the name *bcamca.txt* is of size 16 M. Assume that disk has four free continuous clusters of 8 sectors each. How can this file be given the space on the disk? Also show the content of FAT after the space allocation to this file. You may make suitable assumptions. You may assume the cluster size as 2 sectors, if needed. (4 Marks)
- (e) Explain the following giving their uses and advantages/disadvantages. (Word limit for answer of each part is 50 words ONLY) (6 Marks)
- (i) Memory Interleaving
 - (ii) RAID
 - (iii) IDE interface
 - (iv) CAV and CLV in the context of disks
 - (v) Passive and Active matrix display
 - (vi) Advantages and disadvantages of Ink-jet printers

Question 3 (Covers Block 3)

- (a) A computer has a single core processor having 8 General purpose registers and 8 additional special purpose registers. The machine has 64 KB RAM. The size of each register and memory word is 16 bits each. An instruction of the machine is of fixed length and is equal to two memory words. Each instruction of the machine has two operands – one memory operand and second register operand. Memory

operand uses direct addressing; however, register operand can use either register direct or register indirect addressing. (Please note that if register operand uses indirect addressing, then stated register contains the address of the operand in the memory.) An instruction of a machine consists of operation code bits, One addressing mode bit and one register operand and one memory operand. The addressing mode bit specifies addressing mode as:

Addressing mode bit	Register Operand	Memory Operand
0	Indirect	Direct
1	Direct	Direct

Five of the special purpose registers perform the task as Program Counter (PC), Accumulator (AC), Memory Address Register (MAR), Data Register (DR) and Flag registers (FR). The size of Integer operands on the machine may be assumed to be of equal to size of accumulator register. In order to execute instructions the machine has an Instruction Register (IR) of size 32 bits as each instruction is of this size. Perform the following tasks for the machine.

- (i) Design suitable instruction formats for the machine. Specify the size of different fields that are needed in the instruction format. Also indicate how many different operations can be coded for this machine. Give reasons in support of your answer. (3 Marks)
 - (ii) Put some valid values in certain registers and memory locations and demonstrate examples of different addressing modes of this machine. (1 Mark)
 - (iii) Assuming that the instructions are first fetched to Instruction Register (IR) and memory operands is brought to DR register; indirect operand is brought to AC; and result of operation is stored in the AC register; write and explain the sequence of micro-operations that are required for fetch cycle and execute cycle of an instruction which performs addition of two operands having addressing mode bits as 0. Please note that one of the operand is Indirect Register Operand and the second is a direct memory operand. Make and state suitable assumptions, if any. (6 Marks)
- (b) Assume that you have a machine as shown in section 3.2.2 of Block 3 having the micro-operations as given in Figure 10 on page 62 of Block 3. Consider that R1 and R2 both are 8 bit registers and contains 01111011 and 10000100 respectively. What will be the values of select inputs, carry-in input and result of operation (including carry out bit) if the following micro-operations are performed? (For each micro-operation you may assume the initial value of R1 and R2 as given above) (2 Marks)
- (i) Subtract R2 from R1 with borrow
 - (ii) Exclusive OR of R1 and R2
 - (iii) Shift Left R1 twice
 - (iv) Increment R1

- (c) Explain the structure of Control Unit with the help of block diagram. What is the role of control signals in instruction execution? (3 Marks)
- (d) Explain the reasons of reducing complexity in a RISC machine. What are the advantages of using large register file in RISC? How RISC machine's instruction pipelining different from other machine's instruction pipelining? (2 Marks)
- (e) A RISC machine has 128 registers out of which 32 registers are reserved for the Global variables and 32 for Instruction related tasks. This machine has been designed to have 8 registers for storing two input parameters, two output parameters and four local variables for function call. Explain with the help of a diagram, how the overlapped register window can be implemented in this machine for function/procedure calls. You must explain how the parameters will be passed when a function calls another function. How many levels of calls such a machine can support? (3 Marks)

Question 4 (Covers Block 4)

- (a) Write a program using 8086 assembly Language (with proper comments) that accepts four characters entered using the keyboard. It checks if all these characters are decimal digits. If all of them are decimal digits, then program calculates the equivalent hexadecimal value of the four digit number that has been input. The program then displays this hexadecimal number on the screen. Make suitable assumptions, if any. (7 Marks)
- (b) Write a program using 8086 assembly Language (with proper comments) that passes AL register value as parameter to a near procedure named DIVZERO, which checks if this passed AL value is zero or not. In case this value is ZERO program is terminated, otherwise same value is returned in AL register. Make suitable assumptions, if any. (7 Marks)
- (c) Explain the following in the context of 8086 Microprocessor (6 Marks)
- (i) The supported memory in 8086 is 1 MB whereas instruction offset is only 16 bits
 - (ii) Processing of Interrupts using IVT
 - (iii) Indirect addressing modes of 8086 microprocessor

Course Code	:	MCS-015
Course Title	:	Communication Skills
Assignment Number	:	MCA(2)/015/Assignment/2018-19
Maximum Marks	:	100
Weightage	:	25%
Last date of submission	:	15th October, 2018 (For July, 2018 Session) 15st April, 2019 (For January, 2019 Session)

This assignment has ten questions. Answer all questions. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

Question1:-

Read the passage carefully and answer the questions given below:

Every market activity is an investment in time, energy and money. Few companies would spend a large sum of money on, say, a purchase of capital equipment without a full investigation into why it is needed, the choices available, and the expected return on what has been spent. Yet every year the vast majority of companies invest a large amount of money in marketing actions without knowing what their financial worth to the company or likely return will be. By introducing the discipline arising from market planning, a company should be able to ensure that the costs of marketing planning show a reasonable return and are calculated in the same way as all other business investments.

Many managers believe that the costs of marketing form an additional expense that has to be accepted in order to sell their goods. Whilst it is true that many companies use certain tools of marketing for this purpose, it is also true that the most successful companies accept marketing as an essential part of the company's total commercial operation, for it is an essential cost in the same way as production or finance.

Companies often avoid planning marketing procedures in detail because of the effort needed to express their forward policy in a written form. Managers commonly consider that their time is too valuable to spend on anything other than urgent operational problems. In fact, the manager who spends his time on dealing with current administrative detail is almost certain to have ignored proper planning in the past. For, if properly prepared, the marketing plan will contain sufficient details of the company's policy and operational strategy for the work to be done by an assistant. As the many alternative courses of action are programmed, the assistant takes any action or decisions which are appropriate. Only unusual situations need be dealt with by the manager.

The first step in preparing a marketing plan is that of producing the information necessary for decision making. Usually, a company will have within its own administration and control system the raw material necessary for the plan's

foundations. In addition, there is plenty of published information which is made available by government departments, institutions and the press.

Marketing research is yet to be fully exploited by the majority of companies. It has so far only been used by companies that have recognized that their existing information sources are inadequate. Because of the scale of operations that now confronts the typical businessman, it is essential that investment decisions are based upon relevant information, so reducing the business risk.

For a marketing-oriented activity to produce lasting results, the entire operation has to be systematically planned. By producing basic information in written form and establishing aims for the future, the company is creating standards against which actual performance can be measured. Documentation of detailed policy actions then provides the basis for controlling the company's operation. Future trends may be predicted through the investigation of all factors likely to influence company results.

A good marketing plan is therefore essential to a company's successful development, but so is an effective marketing manager. He must be capable of identifying the parameters for market research and interpreting the data produced so that he can quantify the existing and potential needs of customers. Someone with an eye for style in packaging and product promotion is also a valuable asset. In an ideal world, the manager would possess all these abilities; however, they may be useless if not combined with the real love of and natural flair for the job which allow him sometimes to ignore the rational evidence and act instinctively.

- 1a Why do you think market planning is not calculated in the same way as other business investments. Discuss. (3 Marks)
- 1b Marketing research is still to be fully exploited by companies. Why? Discuss. (3 Marks)
- 1c Who, according to the passage, is an effective marketing manager? (3 Marks)
- 1d Give a title to the passage. Say why you chose it. (2 Marks)
- 1e Find words from the passage which mean the same as the following: (5 Marks)
- i Examining/studying all details (para 1)
 - ii Buying (para 1)
 - iii Necessary (para 2)
 - iv Important/precious (para 3)
 - v A special instinctive aptitude for doing something well (last para)
- 1f Pick one from the options given against each question: (4 Marks)
- i The amount of money spent on marketing by most companies each year
 - a) Equals the amount spent on capital equipment.

- b) Does not give a good return on the investment.
 - c) Is not based on an assessment of its potential value.
 - d) Is viewed by these companies as an important business investment.
- ii Why are marketing plans not written down by many managers?
- a) They don't have time to do it.
 - b) They know it would be difficult to do.
 - c) They spend their time on more important things.
 - d) They don't think it is really necessary.
- iii Good marketing procedures would allow a manager
- a) To take different courses of action.
 - b) To do less work than others.
 - c) To avoid unforeseen problems.
 - d) To give more responsibility to others.
- iv How should a manager begin writing a marketing plan?
- a) By doing market research outside the company.
 - b) By looking at information produced by other companies.
 - c) By analyzing procedures already used by the company.
 - d) By finding information from many different sources.

Question2: Write a letter introducing your company to a prospective customer.
 Include in it: (10 Marks)

- The services/products your company offers.
- Suggest that you could make a presentation about your company at a date and time convenient to your customer.

Question 3: Write a paragraph in about 150 words on any *one* of the following: (10 Marks)

- i Your dream job
- ii Is this an age of excessive technology? Do you agree or disagree? Give reasons for your point of view.
- iii Someone you know who holds a very important job

Question 4: You are Divya/Vishwas. You have just completed your Master's Degree in Computer Application. You have seen an advertisement for the post of Trainee (Technical) at Express Technologies. Write an application to the company. Include details of your qualification and other interests. (10 Marks)

Question 5: Given below are some answers. Write the question. The first one is given as an example: (5 Marks)

- i How many laps can you swim?
I can swim 20 laps.
- ii _____ (basket ball)
Not too well!
- iii _____ (buy running shoes)
From any sports shop.

- iv _____ (use swimming pool)
From 6 am to 9 pm.
- v _____ (dive!)
No, but I can swim.
- vi _____ (play soccer)
On the school playground.

Question 6: Here is a phone conversation. Fill in the blanks with the appropriate modals: (5 Marks)

- Shreya: Hello, I speak to Atul.
- Atul: Hi! Shreya. This is Atul on the line. WhatI do for you?
- Shreya: Hi! Good to speak to you. Please give me Shweta’s telephone no.
- Atul: Of course! Ihave to get it from my mobile phone.
- Shreya: No problem, Ihold on.
- Atul: Oh, Ihave to check it from my diary. I’ll Whatsapp it to you.

Question 7: The following sentences are in the passive voice. Change them into the active voice. (5 Marks)

- i They were told to complete the work on time.
- ii The race was won by a student of Himalaya School.
- iii A good speech is always remembered.
- iv The father was depressed after hearing the news that his son had failed the exam.
- v He was told he would be invited to speak later.

Question 8: Use the phrasal verbs given in the box to complete the sentences given below. You may use a phrasal verb more than once: (10 Marks)

are you through	call back	cut off	get through
hang up	hold on	look up	pick up
			put through

- i The phone’s ringing. Why don’t youthe receiver?
- ii I’m afraid she isn’t available at the moment. Can youlater?
- iii Can youtheir number in the directory, please?
- iv I’m afraid she’s with a client, shall Iyou.....to her secretary?
- v Hello? Are you still there? I thought we werefor a moment.

- vi Mr. Green never seems to be in his office. I've been trying to to him all morning.
- vii Could youfor a moment? I'll just find out for you.
- viii If the secretary puts me on hold and plays me that awful electronic music again, I'll
- ix If you get a wrong number, it's polite to say 'I'm sorry, I've dialed the wrong number' before you
- x If an American asks '.....?', she wants to know if your call is over.

Question 9: Every Diwali a company gives its customers gifts ranging from diaries and calendars to silver items. The financial manager says it's too expensive and wants to stop the practice. The sales manager disagrees. Write a dialogue between the two, stating each person's point of view.
(10 Marks)

Question 10: You are the General Manager (Human Resource Development) of the company. You want to talk about the effective ways of making good presentations to the Sales staff. Use the following points to write the body of your presentation.
(15 Marks)

- How good presentations can benefit your company.
- How speakers should prepare before giving presentations
- The qualities of a good speaker
- How a speaker can keep the attention of the audience
- The effective use of visual aids in presentations

Course Code	:	MCS-013
Course Title	:	Discrete Mathematics
Assignment Number	:	MCA(2)/013/Assignment/2018-19
Assignment Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	15th October, 2018 (For July, 2018 Session) 15th April, 2019 (For January, 2019 Session)

Note: There are eight questions in this assignment, which carries 80 marks. Rest 20 marks are for viva-voce. Answer all the questions. You may use illustrations and diagrams to enhance the explanations. For more details, go through the guidelines regarding assignments given in the Programme Guide.

Question 1:

(a) Prove by mathematical induction that $\sum_{i=1}^n \frac{1}{i(i+1)} = n/(n+1)$ (3 Marks)

(b) Make truth table for followings: (3 Marks)

- i) $p \rightarrow (\sim q \vee \sim r) \wedge (p \vee r)$
- ii) $p \rightarrow (\sim r \wedge q) \wedge (p \wedge \sim q)$

(c) Draw a Venn diagram to represent followings: (2 Marks)

- i) $(A \cup B \cap C) \cup (B \cap C \cup D)$
- ii) $(A \cup B \cap C) \cap (C \sim A) \cap (A \cup C)$

(d) Obtain the truth value of disjunction of “Water is essential for life” and “2+2=4”. (2 Marks)

Question 2:

(a) Write down suitable mathematical statement that can be represented by the following symbolic properties. (2 Marks)

- i) $(\exists x) (\exists y) (\forall z) P$
- ii) $(\forall x) (\exists y) (\exists z) P$

(b) What are conditional connectives? Explain with example. (2 Marks)

(c) Write the following statements in the symbolic form. (2 Marks)

- i) Some students can not appear in exam.
- ii) Everyone can not sing.

(d) What are different methods of proof? Example with example. (4 Marks)

Question 3:

(a) Draw logic circuit for the following Boolean Expression: (2 Marks)
 $(x \vee y \vee z) + (x+y+z)' + (x'zy')$

(b) What is dual of a boolean expression? Explain with the help of an example. (2 Marks)

(c) What is proper subset? Explain with the help of example. (2 Marks)

(d) What is relation? Explain properties of relations with example. (4 Marks)

Question 4:

(a) How many different committees can be formed of 10 professionals, each containing at least 2 Project Managers, at least 3 Team Leaders and 1 Vice President. (3 Marks)

(b) There are two mutually exclusive events A and B with $P(A) = 0.5$ and $P(B) = 0.4$. Find the probability of followings: (2 Marks)

- i) A and B both occur
- ii) Both A and B does not occur

(c) What is equivalence relation? Explain use of equivalence relation with the help of an example. (3 Marks)

(d) Explain the basic properties of sets. (2 Marks)

Question 5:

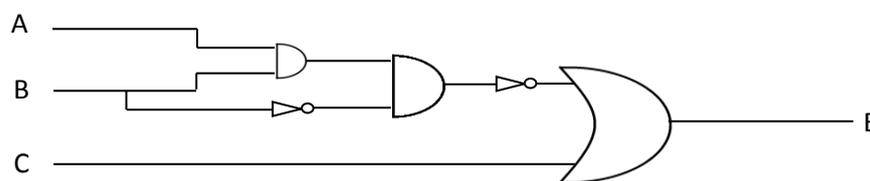
(a) How many words can be formed using letter of **DEPARTMENT** using each letter at most once? (2 Marks)

- i) If each letter must be used,
- ii) If some or all the letters may be omitted.

(b) Show using truth table whether $(P \wedge Q \vee R)$ and $(P \vee R) \wedge (Q \vee R)$ are equivalent or not. (2 Marks)

(c) Explain whether $(P \wedge Q) \rightarrow (Q \rightarrow R)$ is a tautology or not. (3 Marks)

(d) Find dual of boolean expression for the output of the following logic circuit. (3Marks)



Question 6:

(a) How many ways are there to distribute 10 distinct objects into 4 distinct boxes with:

- i) At least two empty box.
- ii) No empty box.

(2 Marks)

(b) Explain principle of multiplication with an example. (2 Marks)

(2 Marks)

(c) Set A,B and C are: $A = \{1, 2, 3, 5, 7, 9, 11, 13\}$, $B = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ and $C = \{1, 2, 4, 5, 6, 7, 8, 10, 13\}$. Find $A \cap B \cap C$, $A \cup B \cup C$, $A \cup B \cap C$ and $(B \sim C)$ (3 Marks)

(d) Show whether $\sqrt{11}$ is rational or irrational. (3 Marks)

Question 7:

(a) What is power set? Write power set of set $A = \{1, 2, 3, 4, 5, 6, 7, 9\}$. (2 Marks)

(b) Give geometric representation for followings: (3 Marks)

- i) $\{-3\} \times \mathbb{R}$
- ii) $\{1, -2\} \times \{2, -3\}$

(c) Explain inclusion-exclusion principle with example. (2 Marks)

(d) Show that : (3 Marks)

$$(P \rightarrow Q) \rightarrow Q \Rightarrow P \vee Q$$

Question 8:

(a) Explain whether function: (2 Marks)

$f(x) = x^2$ posses an inverse function or not.

(b) What are Demorgan's Law? Explain the use of Demorgen's law with example. (3 Marks)

(c) Explain addition theorem in probability, with example. (2 Marks)

(d) Explain distributive laws of Boolean Algebra. (3 Marks)

Course Code	:	BCSL-021
Course Title	:	C Language Programming
Assignment Number	:	BCA(2)/L-021/Assignment/2018-19
Maximum Marks	:	50
Weightage	:	25%
Last date of Submission	:	15th October, 2018 (For July, 2018 Session) 15st April, 2019 (For January, 2019 Session)

This assignment has one question and carries 40 marks. Rest 10 marks are for viva voce. You may use illustrations and diagrams to enhance the explanation. Please go through the guidelines regarding the assignments given in the programme guide for the format of presentation.

Question1: Write an interactive program which prompts the user with the following options on the opening menu to generate the pay-slips for various categories of employees working in a University: (40 Marks)

PAY SLIP GENERATION

- 1) **Faculty (Asst. Professor, Associate Professor, Professor)**
- 2) **Non-Academic Staff**
- 3) **Consultants**
- 4) **Daily-Wagers / Skilled Workers**
- 5) **Security Personals**
- 6) **Quit**

Enter your choice:

If an “1” is entered, prompt the user to take the inputs for calculating the salary for Faculty (Asst. Professor, Associate Professor, Professor) and generating the pay-slip. If “2” is entered prompt the user to take the inputs for calculating the salary for Non-Academic Staff and generating the pay-slip. If “3” is entered prompt the user to take the inputs for calculating the salary for Consultants and generating the pay-slip. If “4” is entered prompt the user to take the inputs for calculating the salary for Daily- Wagers /Skilled Workers and generating the pay-slip. If “5” is entered, prompt the user to take the inputs for calculating the salary for Security Personals. If “6” is entered, it should exit from the program. If the user enters any letters or numbers other than the choice, redisplay the prompt. All outputs should go to the terminal and all input should come from the keyboard.

- Note:**(i) *Give appropriate pay-scales as per 7th Pay Commission for Faculty and Non- Academic Staff of the University. Assumptions can be made for others wherever necessary.*
- (ii) *You must execute the program and submit the program logic, sample input and output along with the necessary documentation for this question.*

Course Code	:	BCSL-022
Course Title	:	Assembly Language Programming Lab
Assignment Number	:	BCA(2)/BCSL022/Assignment/2018-19
Maximum Marks	:	50
Weightage	:	25%
Last Dates for Submission:		15th October, 2018 (For July, 2018 Session) 15st April, 2019 (For January, 2019 Session)

This assignment has two questions of total of 40 marks. Rest 10 marks are for viva voce. Please go through the guidelines regarding assignments given in the programme guide for the format of presentation.

Question 1:

Design a two bit counter circuit that counts from 0 to 3. It should have states 00, 01, 10 and 11. The initial state of the counter may be assumed to be 00. The counter will be in following successive states: 00, 01, 10, 11, 00, 01, 10, 11, 00, 01, 10, 11, 00 ... Use any flip flop to design the circuit. You must design counter using state transition diagram and Karnaugh's map. (10 Marks)

Question 2:

Write and run following programs using 8086 assembly language. (3*10 = 30 Marks)

- (a) Write and run an Assembly language program that converts an ASCII four digit number that is stored in four consecutive byte locations into a packed BCD number that is to be stored in DX register. For example, if ASCII digits 4321 are stored in four consecutive locations then your program will convert them into packed BCD and store it in DX as $(0100\ 0011\ 0010\ 0001)_2$
- (b) Write and run (using appropriate calling program) a near procedure in 8086 assembly language that checks if the input parameter has a value zero or not. If the value is zero subroutines terminates the program else returns a value 1 in AL register.
- (c) Write and run an 8086 assembly language program that finds the sum of odd placed values out of 10 consecutive byte values stored in an array in the memory. For example, if 10 consecutive byte values (in hexadecimal) are - 12, AA, 13, AB, 14, AC, 15, AD, 16, AF, then this program should add only value 12, 13, 14, 15 and 16.