Total No. of Questions—7] [Total No. of Printed Pages—6

Seat
No.

[5119]-101

F.Y. B.C.A. (Science) (First Semester) EXAMINATION, 2017

BCA-101 : FUNDAMENTALS OF COMPUTER

Time : Three Hours **Maximum Marks : 70**

N.B. :— (*i*) Question No. **1** (A and B) are compulsory questions.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* option : [7]

(1) RAM is considered .... because you can access any memory cell directly if you know row and column that intersect at that cell :

(*a*) Real Memory

(*b*) Random Memory

(*c*) Rambus Memory

(*d*) None of the above

(2) A translator which scans the entire program and translates it as whole on to machine code is called as ....

(*a*) Interpreter

(*b*) Compiler

(*c*) Assembler

(*d*) None of the above

P.T.O.

(3) The principal used to store data on magnetize devices is ....

(a) Polarization

(b) Hybridization

(c) Digitization

(d) None of the above

(4) A Real Time Operating System (RTOS) is a .... operating system designed for real time applications.

(a) Embedded system

(b) Multitasking

(c) Single user

(d) None of the above

(5) .... is a document that store data grid of rows and columns.

(a) Notepad

(b) Spreadsheet

(c) Word Processor

(d) None of the above

(6) .... is a program a PC microprocessor uses to get the computer system started after it turned on.

(a) BIOS

(b) MOS

(c) LAN

(d) None of the above

(7)   ADJUST method is used in trouble shooting using idea of isolating a problem using ....

   (a)   Logical fault isolation

   (b)   Testing

   (c)   Replacement

   (d)   None of the above

(B)   Define the following terms :   [7]

   (1)   Computer

   (2)   Software

   (3)   Driver

   (4)   Virus

   (5)   Word Processor

   (6)   EPROM

   (7)   Operating System.

Group I

2.   Answer the following :

   (a)   Describe block diagram of computer with suitable diagram.   [5]

   (b)   What is a programming language ? Explain the different types of programming languages.   [5]

   (c)   Explain operating system with its functions.   [4]

3. Solve the following :

(*a*) Convert the following hexadecimal number into its decimal
equivalent : [4]

    (*i*)   AB97D

    (*ii*)   SFBC6

    (*iii*) 39FD8

    (*iv*)   897BA.

(*b*) Solve the following Binary Arithmetics : [4]

    (*i*) $(110111)_2$

        $\times (1101)_2$

    (*ii*) $(11011011)_2$

        $- (10001001)_2$

    (*iii*) $(10110111)_2$

        $+ (10110111)_2$

    (*iv*) $(10110101)_2$

        $\times (101)_2$

(*c*) Solve the following : [3]

Convert the following decimal number to octal number :

    (*i*) $(1792)_{10}$

    (*ii*) $(359)_{10}$

    (*iii*) $(5100)_{10}$.

(d) Convert the following decimal number to binary : [3]

(i) $(196)_{10}$

(ii) $(2012)_{10}$

(iii) $(5096)_{10}$.

4. Answer the following :

(a) Write short notes on : [4]

(i) Desktop

(ii) Troubleshooting.

(b) State and explain different types of Hardware devices. [4]

(c) Differentiate between Imperative Knowledge and Definitional Knowledge. [3]

(d) Explain impact printers. [3]

Group II

5. Answer the following :

(a) Exlain Networking related problems. [5]

(b) What is presentation ? What are the elements of good presentation ? [5]

(c) What are secondary storage devices ? Explain any *two* secondary storage devices. [4]

6. Answer the following :

(a) Convert the following decimal number into binary number : [4]

(i) $(792865)_{10} = (?)_2$

(ii) $(9234798)_{10} = (?)_2$.

(b) Convert the following hexadecimal number into octal

number : [4]

(i) $(A987BC)_{16} = (?)_8$

(ii) $(658FBE)_{16} = (?)_8$.

(c) Solve the following : [3]

(i) $(1011)_2$

$\times (101)_2$

(ii) $(10100)_2$

$- (110)_2$

(iii) $(101101)_2$

$+ (101)_2$

(d) Explain the limitations of DOS. [3]

7. Answer the following :

(a) Explain characteristics of computer. [4]

(b) State and explain any **5** internal DOS commands. [4]

(c) What is Windows operating system ? Explain the utilities of Windows. [3]

(d) Explain any *one* input device with diagram if necessary. [3]

Seat
No.

[5119]-104

First Year B.C.A. (Science) (I Sem.) EXAMINATION, 2017

104 : COMMUNICATION SKILLS

Time : Three Hours **Maximum Marks : 70**

N.B. :— (*i*) Question No. **1** (A and B) are compulsory.

(*ii*) Attempt any *two* questions from Group I.

(*iii*) Attempt any *two* questions from Group II.

(*iv*) Figures to the right indicate full marks.

1. (A) Choose the *correct* answer from the given options : [7]

(*i*) Minutes of the meeting are :

(*a*) Record of the meeting

(*b*) Time of the meeting

(*c*) Negotiations of the meeting

(*d*) Speeches in the meeting

(*ii*) Memo is a written communication between :

(*a*) Teacher and student

(*b*) Two friends

(*c*) Employer and employee

(*d*) Parents and children

(*iii*) Biting nails while speaking is a sign of :

(*a*) happiness

(*b*) sorrow

(*c*) kindness

(*d*) nervousness

(*iv*) Global communication has become easy because of :

(*a*) television

(*b*) cultural exchange

(*c*) technology

(*d*) trade

(*v*) Dishonesty is .... in communication.

(*a*) Legal barrier

(*b*) Ethical barrier

(*c*) Technological barrier

(*d*) Physical barrier

(*vi*) A formal meeting is said to take place when 2 or more than 2 people :

(*a*) discuss

(*b*) laugh

(*c*) argue

(*d*) inform

(*vii*) .... is a wrong communication.

    (*a*) Verbal

    (*b*) Non-verbal

    (*c*) Miscommunication

    (*d*) Oral

(B) Match the following : [7]

(1)	Agenda	Legal barrier
(2)	Internal Communication	Sitting cross-legged
(3)	Fraud	Shaking head
(4)	Non-verbal communication	Circulars
(5)	Body language	List of items in meeting
(6)	Group discussion	Physical barrier
(7)	Noise	Cooperative participation

Group I

2. (*a*) What is the scope of communication ? [5]

    (*b*) What are the principles of effective communication. [5]

    (*c*) What is communication ? Give its definition and meaning.

[4]

3. (*a*) What strategies should be implemented while listening to announcements ? [4]

    (*b*) Explain the term 'Academic Listening'. [4]

(c) Comment on the role of listening skills in communication. [3]

(d) How can listening be made effective ? [3]

4. *(a)* What is telephonic communication ? [4]

(b) How have mobile phones changed communication ? [4]

(c) What are the advantages of telephonic communication ? [3]

(d) Write a detailed note on aspects of telephone communication.

[3]

Group II

5. *(a)* What is Group Discussion ? Explain the types of Group Discussion. [5]

(b) Write a business letter to the manager of a computer firm giving an order of 20 comptuers for the College Computer Lab. [5]

(c) Prepare minutes of a meeting held to discuss the celebration of teacher's day in your college. [4]

6. *(a)* Write a letter of application for the post of asistant in a computer laboratory of a college. [4]

(b) What points should you keep in mind while writing your Resume ? [4]

(c) What are the advantages and disadvantages of an interview ? [3]

(d) Write a report on the 'Sports Meet' in your college. [3]

7. (*a*) What are some of the negotiation skills ?   [4]

(*b*) What is meant by empathy ? Elaborate its significance in communication.   [4]

(*c*) What is reflective thinking ?   [3]

(*d*) Why are intrapersonal skills important in communication ?   [3]

Total No. of Questions—7]

Seat
No.

[5119]-201

F.Y. B.C.A. (Science) (II Semester) EXAMINATION, 2017

201 : COMPTUER ORGANIZATION

(2016 PATTERN)

Time : Three Hours   **Maximum Marks : 70**

N.B. :— (*i*)   Question No. **1** is compulsory.

(*ii*)   Attempt any *two* from Group I and any *two* from Group II respectively.

(*iii*)   Draw neat diagram wherever necessary.

(*iv*)   Figures to the right indicate full marks.

1.   (A)   Attempt the following :   [7]

(*i*)   The binary equivalent of $(11\text{-}55)_{10}$ is ....

(*a*)   1011.1001

(*b*)   1011.10001

(*c*)   101.10001

(*d*)   1101.10001

(*ii*)   A + $\overline{A}$B = ...

(*a*)   B

(*b*)   A + B

(*c*)   AB

(*d*)   None of the above

(*iii*) .... subtracts two bits along with the borrow generated from previous bit position.

(*a*) Half subtractor

(*b*) Full subtractor

(*c*) Half adder

(*d*) Full adder

(*iv*) In .... counter the clock is applied parallely to all flip-flops.

(*a*) Asynchronous

(*b*) Ripple

(*c*) Synchronous

(*d*) None of the above

(*v*) ALU is ....

(*a*) Adding and logical unit

(*b*) Algorithm and logical unit

(*c*) Arithmetic and logical unit

(*d*) Arithmetic and lexical unit

(*vi*) EPROM is ....

(*a*) Ejectable Program Read Only Memory

(*b*) Erasable Programmable Read Only Memory

(*c*) Erasable Perishable Read Only Memory

(*d*) Erasable Programmable Reject Only Memory

(*vii*) 8086 is a .... bit microprocessor.

(*a*) 32

(*b*) 16

(*c*) 24

(*d*) 48

(B) Attempt the following :   [7]
   (*i*) Draw the symbol for NOT gate and OR gate.
   (*ii*) What is an encoder ?
   (*iii*) Define positive edge triggered flip-flop.
   (*iv*) List the types of buses.
   (*v*) State the different types of printers.
   (*vi*) Give the structure of flag register.
   (*vii*) What is positive and negative logic ?

Group I

2. Attempt the following :
   (*a*) Build AND, OR, NAND and EX-OR gate using NOR gate. [5]

   (*b*) Write a short note on half subtractor.   [5]

   (*c*) (*i*)   1111 . 1101   [4]

                   10111 . 1110

               + 100 . 1010
               ─────────────

               ─────────────

         (*ii*)   110011.10

               − 11110 . 11
               ─────────────

               ─────────────

         (*iii*) 11110 ÷ 10

         (*iv*)   11 . 01

               × 11 . 10
               ─────────

               ─────────

3. Attempt the following :

(*a*) Which are the common applications of flip-flops. Explain the bounce eliminating switch. [4]

(*b*) Draw and explain logic diagram of 3 to 8 line decoder. [4]

(*c*) Simplify using Boolean algebra and draw simplification diagram $A\overline{B}C + \overline{A}\overline{C}D + \overline{C}A$. [3]

(*d*) Explain weighted and unweighted codes. [3]

4. Attempt the following :

(*a*) With a neat diagram explain the working of 1-bit ALU. [4]

(*b*) Give the steps for processing of an instruction. [4]

(*c*) Give the interrupt processing sequence. [3]

(*d*) Write or give the memory classification. [3]

Group II

5. Attempt the following :

(*a*) Draw block diagram of 8087 and mention why it is needed. [5]

(*b*) What is an IVT ? Draw its structures. [5]

(*c*) Write a short note on paging and segmentation. [4]

6. Attempt the following :

(*a*) Explain the functions of the CPU. [4]

(*b*) Write a short note on instruction pipeline. [4]

(*c*) Explain the terms : address register, control and status register in DMA. [3]

(*d*) Explain external memory in short. [3]

7. Attempt the following :

(*a*) What do you mean by modulus of a counter ? [4]

(*b*) Draw logic gate, and give Boolean function and truth table for EX-NOR gate. [4]

(*c*) Write a short note on T-flip flop. [3]

(*d*) Convert the following : [3]

(*i*) $(701.108)_8 = (?)_{16}$

(*ii*) $(3A2.5B)_{16} = (?)_{10}$

(*iii*) $(85.CA)_{16} = (?)_8$

Seat
No.

[5119]-202

F.Y. B.C.A. (Science) (II Semester) EXAMINATION, 2017

BCA–202 : ADVANCED PROGRAMMING IN C

Time : Three Hours   **Maximum Marks : 70**

N.B. :— (*i*)   Question No. **1** (A and B) are compulsory.

(*ii*)   Attempe any *two* questions from Group–I

(*iii*) Attempt any *two* questions from Group–II

(*iv*)   Figures to the right indicate full marks.

1.   (A)   Choose the appropriate option.   [7]

(*i*)   In which stage the # include < stdio.h > gets replaced by the contents of the file stdio.h ?

(*a*) During editing   (*b*) During linking

(*c*) During execution   (*d*) During preprocessing

(*ii*) What will be output of program.

```
# include < stdio.h>
int main ( )
{
int i = 3, * j, k ;
j = & i;
printf ( "% d\n",    i* *j * + *j);
return 0;
```

(*a*) 30

(*b*) 27

(*c*) 9

(*d*) 3

(*iii*) If the two strings are identical, then strcmp () function returns :

(*a*) −1   (*b*) 1

(*c*) 0   (*d*) yes

(*iv*) Which of the following is a collection of different data types ?

(*a*) String   (*b*) Array

(*c*) Structure   (*d*) Files

(*v*) The size of union is size of the longest element in the union :

(*a*) Yes   (*b*) NO

(*vi*) The function used to release previously allocated space from memory is :

(*a*) malloc   (*b*) Free

(*c*) release   (*d*) none

(*vii*) Find the output of the following :

```
#  include  <  stdio.h  >
#  define  int  char
void  main  (  )
    }
    int  i  =  65;
    Printf  ("sizeof  (i)  =  %d",  sizeof  (i));  }
```

(*a*) 2   (*b*) 1

(*c*) 4   (*d*) 8

(B)   Attempt the following :   [7]

   (*i*)   Define structure.

   (*ii*)   All members of union can be accessed at a time–state

      true or false.

   (*iii*)   What is the difference between string variable and string

      literal ?

   (*iv*)   How can a pointer to pointer be declared ?

   (*v*)   State the purpose of # error directive.

   (*vi*)   Write the purpose of function ftell( )

   (*vii*)   fwrite function writes a block of data from binary file

      to memory. State true or false.

Group–I

2.   Answer the following :

(*a*)   Differentiate between macro and function.   [5]

(*b*)   Write a program using pointer to array concept to add two

   1D arrays store addition in third array.   [5]

(*c*)   Write syntax and prototype of the following functions : [4]

   (*i*)   strlen( )

   (*ii*)   strcpy( )

   (*iii*)   strcat( )

   (*iv*)   strcmp( )

3.   Attempt the following :

(*a*)   Write a program in C for finding the largest of 2 numbers

   using macro.   [4]

(*b*)   Write a note on Dynamic memory allocation.   [4]

(*c*) Write a C program to copy one string into another string (Copy alternate characters)

S1 = "Hello"

S2 = "HIO" [3]

(*d*) Explain the purpose of each of the following declaration : [3]

(*i*) int(* x) (int * a);

(*ii*) int(* a) (int, int);

(*iii*) int(* p) (char);

4. Answer the following :

(*a*) Write a program to accept details of *n* students (S_no, S_name, S_div, S_mark1, S_mark2) and display students details of 'A' division. [4]

(*b*) Explain how union can be used within structure. [4]

(*c*) Explain the file opening modes with their meaning. [3]

(*d*) Write a note on Array of structures. [3]

Group–II

5. Attempt the following :

(*a*) What is a structure ? How is a structure declared and initialized ? Give an example. [5]

(*b*) Differentiate between structure and union. [5]

(*c*) What are streams ? List the *five* streams that are automatically opened when program runs. [4]

6. Answer the following :

(*a*) Illustrate how a character can be written to and read from a file. [4]

(b)   Write a program using command line argument to display the contents of a file.   [4]

(c)   How typedef can be used with structures ?   [3]

(d)   How to declare a union and how their members can be accessed ?   [3]

7.   Attempt the following :

(a)   Write any *four* predefined macros in C language.   [4]

(b)   What are command line arguments ? Write their advantages. [4]

(c)   Find the output of the following.   [3]

main ( )

{

int a = 10, b = 15;

change (a, & b)

printf ("%d %d", a, b) ;

}

change (int x, int *y)

{

    x = 20;

    *y = 30;

    }

(d)   C makes no difference between char S (10) and char *S. Comment.   [3]

Total No. of Questions—7]   [Total No. of Printed Pages—4+2

Seat
No.   **[5119]-203**

F.Y. B.C.A. (Science) (Second Semester) EXAMINATION, 2017

BCA 203 : APPLIED MATHEMATICS–II

Time : Three Hours   **Maximum Marks : 70**

N.B. :— (*i*)   Question Number **1** is compulsory.

(*ii*)   Attempt any *two* questions from Group–I and any *two*
questions from Group–II

(*iii*) Figures to the right indicate full marks.

1.   (A)   Choose the *correct* alternative.   [7]

(*i*)   If k is an odd number, then k^2-1 is divisible by :

(*a*)   8   (*b*)   4

(*c*)   2   (*d*)   None of these

(*ii*) The order of 3 in Z_{13} is :

(*a*)   3   (*b*)   4

(*c*)   5   (*d*)   None of these

(*iii*) If $\phi (m)$ is the number of elements of [m] that are co-prime
to m, then $\phi (60)$ is :

(*a*)   8   (*b*)   16

(*c*)   32   (*d*)   None of these

(*iv*) If two graphs are isomorphic then their complements are :

(*a*)　always isomorphic　(*b*) Some times isomorphic

(*c*)　Never isomorphic　(*d*) None of these

(*v*) If every vertex of a graph G has degree at least two, then G contains *a* :

(*a*)　a leaf　(*b*) cycle

(*c*)　No cycle　(*d*) None of these

(*vi*) The chromatic polynomial of a tree with *n*-vertices is :

(*a*)　k^n　(*b*) $(k-1)^{n-1}$

(*c*)　$k\ (k-1)^{n-1}$　(*d*) None of these

(*vii*) If F_n is the Fibonacci number, $n = 0, 1, 2 \ldots$, then

$$1 + \sum_{i=0}^{n} \quad \text{is} :$$

(*a*)　F_{n+1}　(*b*) F_{n+2}

(*c*)　F_{n+3}　(*d*) None of these

(B) Answer the following questions in *one* or *two* lines.　　[7]

(*i*)　If S = N–{1} = {2, 3, 4, ...}. Define the relation R on S by $(x, y) \in R$ if and only if gcd $(x, y) > 1$. Determine whether R is a transitive relation.

(*ii*)　Use the pigeonhole principle to show that if S $\subseteq$ N and |S| = 37, then S contains two elements that have the same remainder when divided by 36.

(iii) If $a_n = a_{n-1} + 2\, a_{n-2}$ for $n \geq 2$ with $a_0 = 1$ and $a_1 = 8$, then find the characteristic equation of the above recurrence relation.

(iv) Let G be a regular graph of degree n and G' = G − V for some vertex $v \in$ V (G). Is G' regular of degree $(n-1)$? (G is regular of degree n means $d(v) = n$) for each vertex in G

(v) What is the Euler's formula for a connected plane graph.

(vi) Is K_5 a planar graph ? Justify.

(vii) State Chinese Remainder theorem.

Group–I

2. (i) Prove that for every $n \in$ N. Congruence modulo n is an equivalence relation. [5]

(ii) If G is a graph with vertex set in which vertices u, v are adjacent if and only if u and v are relatively prime, then draw the graph and find the number of edges in G. [5]

(iii) How many natural numbers less than 200 have no divisor in {6, 10, 15} ? [4]

3. (i) If p is a prime and a is not a multiple of p, then prove that $a^{p-1} \equiv 1 \pmod{p}$. [4]

(ii) How many natural numbers less than 252 are co-prime to 252 ? Justify. [4]

(*iii*) Find all spanning trees of graph G. [3]
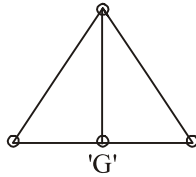
(*iv*) Let a, b, x, n be positive integers. Prove that the following statement is not always true. [3]

" If $ax \equiv bx$ mod n, then $a \equiv b$ mod n"

Prove by a counter example and add a hypothesis on x and n to make the statement always true.

4. (*i*) Let G be a graph with n-vertices and $(n-1)$ edges. Prove that G is connected if and only if G has no cycles. [4]

(*ii*) Define wheel with n-vertices. Determine the chromatic number of the wheel with n-vertices. [4]

(*iii*) Find a formula for a_n for the following recurrence relation :
$a_n = 3a_{n-1} - 2$, $n \geq 1$ with $a_0 = 1$ [3]

(*iv*) If G is a connected graph in which every vertex has even degree, then prove that G has no edge whose deletion leaves a disconnected graph. [3]

Group–II

5. (*i*) Prove that every tree with n-vertices has $(n-1)$ edges. [5]

(*ii*) Define an Eulerian graph. Prove or disprove. There is no Eulerian graph with an even number of vertices and an odd number of edges. [5]

(*iii*) Solve the following recurrence relation $a_n = 2a_{n-1} + 3a_{n-2}$ for $n \geq 2$ with $a_0 = a_1 = 1$ [4]

6. (*i*) Let G be the graph with vertex set [V] in which vertices u and v satisfy the adjacency relation if and only if u and v differ by 4. Draw the graph and determine the number of components of G. [4]

(*ii*) Are the following two graphs isomorphic ? Justify. [4]
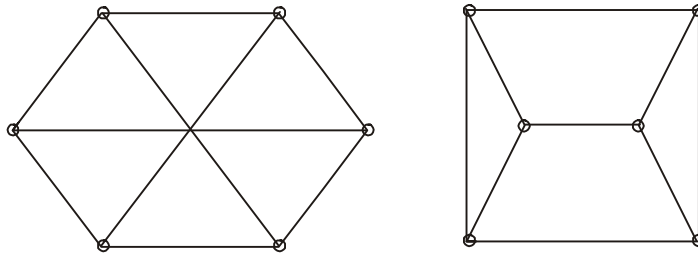
(*iii*) If $f(x)$ is a generating function for the Fibonacci number, then prove that : [3]

$$f(x) = \frac{1}{1 - x - x^2}$$

(*iv*) State the polygon problem for triangulations of a convex polygon. How many ways are there to triangulate a convex polygon with 5 sides. [3]

7. (*i*) Find the remainder of 11^{902} when divided by the prime number, 31. [4]

(*ii*) If a and b are not congruent to 0 mod p, a prime number then show that ab is not congruent to 0 mod p. [4]

(*iii*) Use Pigeonhole principle for the following :

If a and p are relatively prime, then there exist some $b \in \{1, 2,..., p-1\}$ such that $ab \equiv 1 \mod p$ [3]

(*iv*) Use inclusion-exclusion principle to determine the number of words of length 5 that can be formed from letters $\{x, y, z, w, i\}$ such that the first letter is x or the last letter is i. [3]

Total No. of Questions—7]   [Total No. of Printed Pages—7

Seat
No.

[5119]-204

B.C.A. (Science) (I Year) (Second Semester) EXAMINATION, 2017

BCA-204 : RELATIONAL DATABASE MANAGEMENT SYSTEM

(2016 PATTERN)

Time : Three Hours   **Maximum Marks : 70**

N.B. :—   (*i*)   Question No. **1** is compulsory.

(*ii*)   Attempt any *two* questions from Group I and Group II respectively.

(*iii*)   Figures to the right indicate full marks.

1.   (A)   Attempt *all* of the following :   [7×1=7]

(*a*)   The files of randomly ordered records are called as .... files.

(*i*)   index

(*ii*)   heap

(*iii*)   both (*i*) and (*ii*)

(*iv*)   None of the above

(*b*)   The capacity to change the physical schema without having change to logical or view schema is known as ....
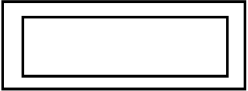
(*i*)   physical data independence

(*ii*)   logical data independence

(*iii*)   data independence

(*iv*)   None of the above

(c) A key consisting of two or more columns is called
as ....

    (i) Composite key

    (ii) Candidate key

    (iii) Key

    (iv) Database key

(d) The attributes which act as primary key in one table
and a reference key in another table is a ....

    (i) Primary key

    (ii) Super key

    (iii) Foreign key

    (iv) None of the above

(e) Repetition of data in a table is known as ....

    (i) dependency

    (ii) accuracy

    (iii) tendancy

    (iv) redundancy

(f) Which of the following notations represents weak entity ?

    (i)

    (ii)

    (iii)

    (iv)

(*g*) Inner join is also konwn as ....

  (*i*)   Full join

  (*ii*) Equi join

  (*iii*) Natural join

  (*iv*) Semijoin

(B) Attempt *all* of the following :   [7×1=7]

(*a*) Define the term 'Cardinality'.

(*b*) State the desirable properties of decomposition.

(*c*) What is relationship set ?

(*d*) State various commands that come under DDL.

(*e*) 'A sorted file is best if range selection is designed.'
       State True or False. Justify your answer.

(*f*) Define functional dependency.

(*g*) In .... database we have strict parent-
       child relationship only.

  (*i*)   network model

  (*ii*) hierarchical model

  (*iii*) relational model

  (*iv*) none of the above

Group I

2. Attempt *all* of the following : [5+5+4=14]

(*a*) Write short note on data abstraction and data independence.

(*b*) Differentiate between strong entity and weak entity.

(*c*) What is Indexed File Organization ?

3. Attempt *all* of the following : [4+4+3+3=14]

(*a*) Define File. Discuss physical and logical files in detail.

(*b*) What is data model ? Write short note on network data model.

(*c*) Write a short note on participation constraints in ER model.

(*d*) What is trivial functional dependency ? Explain with example.

4. Attempt *all* of the following : [4+4+3+3=14]

(*a*) An IT industry is developing several projects on various domains (banking, education, inventory etc.) for many of its clients. Many IT professionals are working on one project and an IT professional can work on many projects :

    (*i*) Identify the entity sets, their attributes and primary key for each entity.

    (*ii*) Identify the relationship set and draw an ER diagram.

(*b*)   Explain various set operations with syntax and example.

(*c*)   Consider the following relations,

Machine (m_no, m_name, m_type, m_cost)

Part(p_no, p_name, p_desc).

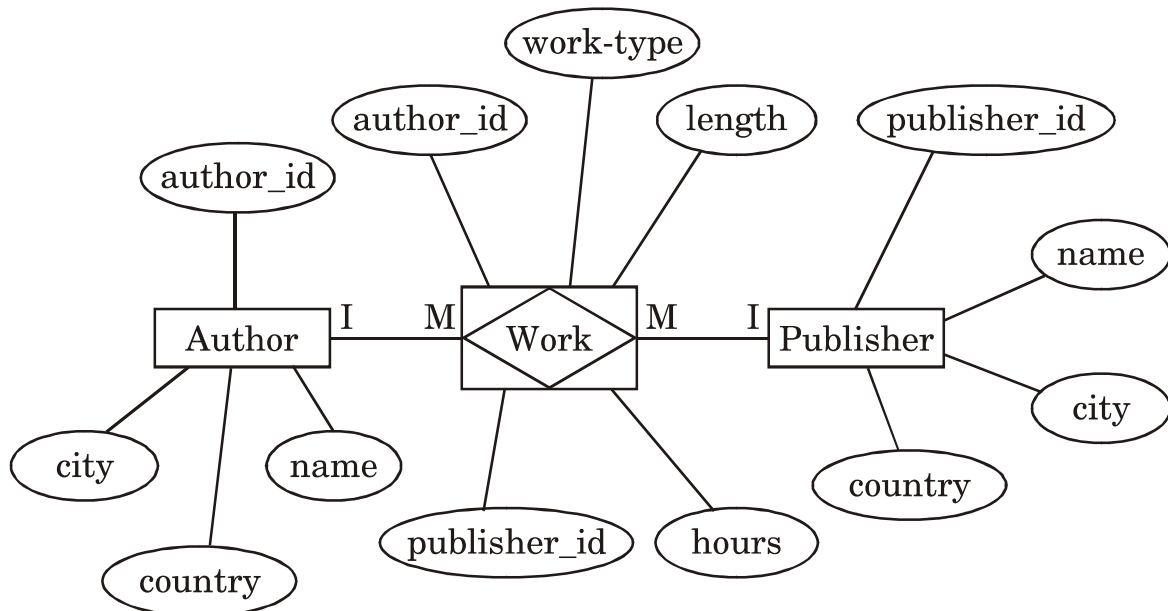Machine and part are related with one to many relationship. Create RDB and solve queries.

(*i*)   Increase the cost of machine by 10%.

(*ii*)   Delete all machines having particulars "wheel".

(*iii*) List all machines whose cost >1,00,000.

(*d*)   Consider the ER diagram given below and convert it into relational model.

Group II

5. Attempt *all* of the following : [5+5+4=14]

(*a*) Write a short note on components of SQL.

(*b*) What are the pitfalls in relational database design ?

(*c*) Write a note on 'Uses of DBMS'.

6. Attempt *all* of the following : [4+4+3+3=14]

(*a*) What is Join ? What is basic condition for taking join of two relations ? Explain any *two* types of join with example.

(*b*) Compute $(BCD)^+$ with the functional dependency :

A → BC, CD → E, E → C, D → AEH,

ABH → BD, DH → BC.

(*c*) Consider the following relations :

Doctor (docno, name, specialization)

Hospital(hospno, name, addr.)

Doctor and Hospital are related with many relationship, with attribute day, create RDB for above and solve the queries.

(*i*) List names of doctors visiting 'Nobel Hospital on Monday'.

(*ii*) Delete all doctors with specialization 'gynaec'.

(*d*) Explain the purpose of normalization and define the terms :

    (*i*)   1NF

    (*ii*)   2NF

    (*iii*) 3NF.

7. Attempt *all* of the following :   [4+4+3+3=14]

  (*a*)   Discuss various types of keys used in RDB.

  (*b*)   Explain concept of overflow pages in ISAM.

  (*c*)   Write a note on 'Generalization' with e.g.

  (*d*)   Consider the relations :

       donor(did, dname, addr)

       patient(pid, pname, paddr.)

       donor and patient are related by many to many with descriptive attribute date of donation :

       (*i*)   Draw an ER diagram.

       (*ii*)   Normalize database with necessary constraints.