

**DEPARTMENT OF TECHNOLOGY PROMOTION AND COORDINATION**

**UNIVERSITY OF COMPUTER STUDIES**

**SECOND YEAR (B.C.Sc. & B.C.Tech.)**

**FIRST SEMESTER EXAMINATION**

**MARCH, 2016**

**ENGLISH**

**ZONE IV**

**Answer All Questions.**

**Time Allowed: 3 Hours**

- L Read the passages and answer the following questions. ( 20 Marks )**

Language is an extraordinary institution, standing in as much need of explanation as any other aspect of human life, possibly more. But to explain it, one has to stop taking it for granted. Virtually all of us are pretty fluent employers of language; we grow up with it as we grow up with the ability to walk or run, and using it seems as easy as those activities. To see how truly remarkable language is, we must, as the psychologist Wolfgang Kohler put it, retreat to a 'psychic distance' from the subject.

Language is the most complex and sophisticated of our possessions. Only very recently, for instance, have grammarians begun to uncover the enormously complicated rules of grammar which underlie our languages, and they still have a long way to go. Computers can be marvellous at dealing with mathematics and playing chess. Yet, at least at present, no computer is at all close to the reproduction of human verbal abilities. Computers are, at best, second-rate users of language, while animals are not users of language at all.

Talking might be seen as the defining characteristic of human beings. No doubt we are also the only creatures who laugh, and have two legs and no feathers - but that is not too interesting. We may be the only creatures who use tools and who organise politically - and this is more interesting. Still, amongst many peoples, political organisation and the use of tools are extremely rudimentary, whereas all known communities have possessed sophisticated languages. Further, it is probably easier to find analogies in the animal world to tools and politics than it is to language.

Many animals, of course, are capable of producing noises which cause their friends or enemies to respond in certain ways, but these noises are so different in kind from human speech that it is, at best, a misleading analogy to speak of such noises being part of a language. First, animals are incapable of organising their noises into sequences beyond the most primitive level, whereas the most salient characteristic of human talkers is their ability to form an infinite number of sequences from a limited stock of noises. As the poet and critic Herbert Read once remarked, 'no difference between man and beast is more important than syntax'. Second, animals produce their noises in direct response to stimuli in their environment, as when a bird squawks at the approach of a cat. Such noises are analogous to human cries of pain or alarm, not to the sentences we produce. Nothing in my environment 'stimulated' me to write down the sentence I just wrote down. In the light of this, it is easier to understand those followers of the French philosopher René Descartes who found it impossible to suppose that animals could be capable of any mental activity. 'If beasts reasoned,' said one of them, 'they would be capable of true speech with its infinite variety.' We might not want to go as far as that, but at least we must admit that speech is one, if not *the*, salient feature of human nature which distinguishes it from any other sort of nature.

Not only is language our most sophisticated, important and unique possession, it is also, remarkably enough, an almost universal human possession. As already mentioned, all known human societies have possessed a language, whatever else each of them may have lacked. Not only that, but whereas there are mathematical geniuses and chess-playing geniuses, when it comes to language, nearly all of us are capable of producing and understanding an infinite number of sentences.

Language is also remarkable in its versatility. By uttering the appropriate noises, in the right circumstances, a single person in a single day can easily do each of the following: inform others of what is happening, ask them to do something, command them, excite them, promise them, insult them, express anger and get married. As some of these examples show, we do not in general utter noises as an activity separate from other activities. We perform actions with words, actions which it would be difficult, inconvenient or even impossible to perform without words. The number of such possible actions is indefinitely large.

### Questions 1-6

Do the following statements reflect the claims of the writer in Reading Passage ?

On your answer sheet write

- YES** if the statement reflects the claims of the writer  
**NO** if the statement contradicts the claims of the writer  
**NOT GIVEN** if it is impossible to say what the writer thinks about this

1. Grammarians now have a thorough understanding of their subject.
2. Even the least developed communities have complex languages.
3. Certain noises that animals make can be classified as language.
4. Certain human cries have something in common with animal communication.
5. People who are good mathematicians are likely to be good at chess.
6. Talking usually forms part of a wider activity.

### Questions 7-10

Complete the notes below.

Choose NO MORE THAN ONE WORD from the passage for each answer.

Write your answers on your answer sheet.

Characteristics of human beings:

- unlike animals, able to use language and to 7.....
- far more capable than animals of manipulating 8..... politically

Characteristics of animals:

- cannot create 9.....
- only make sounds in reaction to 10.....

### II. Fill in the spaces with the words below.

( 10 Marks )

satisfactorily      that      shape      than      and  
create                it           character      of      plot

Happiness in life could be defined as successfully acting as the chief 1.....in a story one has written oneself. While individuals 2..... a meaningful personal story through action, experience, behaviour 3..... memory, so too the history of a nation (or other group) is a story 4..... gives meaning to the members of that nation living today.

Historians try to combine an understanding 5..... social, economic, political and cultural activity into a general story, explaining how these have affected each other to 6..... the general course of human events.

Historians use rational scientific methods like the study of statistics and data, but their goal is to tell stories that make sense and have a 7..... Many facts are, or seem, certain. But the meaning of those facts, or even the full story of what happened, is less obvious 8..... one might think. To understand and explain the past, the historian must develop a theory and test 9..... against the evidence he or she has collected. In a nutshell, the more evidence it can 10..... account for, the better the theory.

**III.(A) Complete the sentences with the verbs in parentheses. Use any appropriate tense.**  
**( 17 Marks )**

On June 20th, I returned home. I 1.....(be)..... away from home for two years. My family 2.....(meet)..... me at the airport with kisses and tears. They 3.....(miss)..... me as much as I had missed them. I 4.....(be)..... very happy to see them again.

When I 5.....(get)..... the chance, I 6.....(take)..... a long look at them. My little brother 7.....(be)..... no longer little. He 8.....(grow)..... a lot. He 9.....(be)..... almost as tall as my father. My little sister 10.....(wear)..... a green dress. She 11.....(change)..... quite a bit too, but she 12.....(be, still)..... mischievous and inquisitive. She 13.....(ask)..... me a thousand questions a minute, or so it seemed.

My father 14.....(gain)..... some weight, and his hair 15.....(turn)..... a little grayer, but otherwise he was just as I had remembered him. My mother 16.....(look)..... a little older, but not much. The wrinkles on her face 17.....(be)..... smile wrinkles.

**III.(B) These sentences contain errors. Correct them.** **( 5 Marks )**

1. Fast-food outlets are open longer that ordinary restaurants.
2. I would rather have a sandwich then a pizza.
3. The number of people who eat rice is considerably greater the number who eat potatoes.
4. The amount of meat eaten in the USA is far more that eaten in China.
5. Hamburgers are more popular as noodles in Europe.

**III.(C) For each space, choose the right word from the box. In some cases, there is more than one possibility. There is an example to help you.** **( 8 Marks )**

<i>that</i>	<i>which</i>	<i>who</i>	<i>whom</i>	<i>whose</i>
-------------	--------------	------------	-------------	--------------

Are you one of those people *0 whose* expenditure is greater than their income? If so, read on - you might find out why you spend so much on goods *1* .....you don't really need.

One of the most common techniques with *2* .....advertisers try to persuade you to buy their products is for a person *3* .....name and face you know well to tell you that they can't live without that particular product. These celebrities, most of *4* .....can hardly need the money *5* .....they receive for it, may endorse the most unexpected products - like the footballer *6* .....appeared in an advertising campaign for packets of snack food.

Another common style is the advert in *7* .....we're told that everybody else has already bought the product, so you'd better hurry if you don't want to be the one person *8* .....doesn't have it. This high-pressure approach generally works because it's difficult for you to find out whether or not the product is really selling well.

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(A) You are looking for a part-time job in a sports centre. Write a letter to the manager of the sports centre. ( 7 Marks )

In your letter

- introduce yourself
- explain what experience and special skills you have
- tell him/her when you think you could start.

(B) Describe someone who has motivated you. ( 7 Marks )

You should write:

who they are  
what was special about this person  
what other people say about this person  
and explain why this person has motivated you.

(C) 1. What kinds of food do you like best? ( 2 Marks )  
2. What is your idea of a perfect meal? ( 2 Marks )  
3. What do you eat on special occasions? ( 2 Marks )

Write about the following topic: ( 20 Marks )

Marks )

Millions of people every year move to English-speaking countries such as Australia, Britain or America, in order to study at school, college or university.

Why do so many people want to study in English?

Why is English such an important international language?

Give reasons for your answer and include any relevant from your own knowledge or experience.

**Department of Technology Promotion and Coordination**

**University of Computer Studies**

**Second Year (B.C.Sc./ B.C.Tech.)**

**First Semester Examination**

**Java Programming (CST-201)**

**March, 2016**

**Zone IV**

**Answer all questions.**

**Time allowed: 3 hours**

1. Choose the correct answer for the following questions. (15 marks)
- (i). To compile a Java program is to translate a Java program into \_\_\_\_\_ which is executable by a Java Virtual Machine.  
(a) machine code    (b) assembly code    (c) byte code    (d) java code
- (ii). What is the legal range of values for a variable declared as a byte? Select the one correct answer.  
(a) 0 to 256    (b) -128 to 127    (c) -128 to 128    (d) 0 to 255
- (iii). What is the number of bytes used by Java primitive long?  
(a) 2    (b) 4    (c) 8    (d) 32
- (iv). Java has a list of reserved words that can be identifiers.  
(a) true    (b) false
- (v). What is not a primitive data type in Java?  
(a) String    (b) byte    (c) short    (d) Boolean
- (vi). Which of the following is NOT a modifier?  
(a) public    (b) static    (c) void    (d) protected
- (vii). Which of these methods of String class can be used to test two strings for equality?  
(a) isequal()    (b) isequals()    (c) equal()    (d) equals()
- (viii). In Java, elements of an array are automatically initialized to some default value. What is the default value for the elements of an array of integers?  
(a) 0    (b) "0"    (c) null    (d) false
- (ix). A procedure always returns a value to the caller.  
(a) true    (b) false
- (x). ----- operator is used to create an object.  
(a) class    (b) new    (c) print    (d) main
- (xi). What modifier should you use on a class so that they are accessed from anywhere in the program.  
(a) private    (b) public    (c) protected    (d) default
- (xii). ----- package need to import for using file class.  
(a) java.lang.\*;    (b) java.util.\*;    (c) java.io.\*;    (d) java.sql.\*

- (xiii). A String Tokenizer is a predefined Java Class found in the ----- package  
 (a) java.lang.\*;      (b) java.util.\*;      (c) java.io.\*;      (d) java.sql.\*
- (xiv). ----- is the bringing together of a set of fields and methods into an object definition and hiding their internal workings from the users of the object.  
 (a) Inheritance    (b) Encapsulation    (c) Generalization    (d) Polymorphism
- (xv). An interface is a named collection of method definitions that do not have implementations.  
 (a) true    (b) false

2. What is the output of the following programs? (15 marks)

- (i). public class Test1 {  
     public static void main(String[] args) {  
         int a=0x11;  
         int b=0110;  
         int c=111;  
         System.out.println("a = "+a);  
         System.out.println("b = "+b);  
         System.out.println("c = "+c);  
     }  
 }  
 }
- (ii). public class Test2 {  
     public static void main(String[] args) {  
         int a=5, b=3, c=7, d=9;  
         int answer = a++ - --b + ++c + d--;  
         System.out.println("Answer = "+answer);  
         System.out.println(" a = "+ a );  
         System.out.println(" b = "+ b );  
         System.out.println(" c = "+ c );  
         System.out.println(" d = "+ d );  
     }  
 }  
 }
- (iii). public class Test3 {  
     public static void main(String[] args) {  
         int a=8;  
         int b=11;  
         int c=a ^ b;  
         System.out.println("Decimal c= "+ c );  
         int d=~a;  
         System.out.println("Decimal d= "+ d );  
         int e=b>>2;  
         System.out.println("Decimal e= "+ e );  
     }  
 }  
 }

(iv). public class Test4{  
 public static void main(String[] args) {  
 int j=1;  
 for(int i=0; i<5; i+=2)  
 {  
 j+=i;  
 System.out.println( " i = "+ i + " j = "+j );  
 }  
 }  
}

(v). public class Test5 {  
 public static void main(String [] args) {  
 String [][]names={{“Mr.”, “Mrs.”, “Ms.”}, {"Smith”, “Jones”}};  
 System.out.println(names[0][0]+names[1][0]);  
 System.out.println(names[0][2]+names[1][1]);  
 }  
}

3. Detect and Correct of the following programs. (15 marks)

- (i) Detect and correct the following program to compute the total of 8 random odd numbers ranging from 0 to 6 (inclusive).

```
public class test1 {  

    public static void main(String[] args) {  

        int total=0;  

        for(int count=1;count<=8;count)  

        {  

            int randomInt;  

            do  

            {  

                randomInt =(int)(Math.random()*10);  

            } while(randomInt %2==0)  

            System.out.println(randomInt);  

            total= randomInt;  

        }  

        double avg=total;  

        System.out.println(avg);  

    }  

}
```

(ii) public class Matrix {  
 Public static void Main(String[] args)  
 {  
 int[][] matrix=new int[10][10]  
 for (int i = 1; i < 10; i++)  
 {  
 for (int j = 0; j < 11; j++)  
 {  
 matrix[i][j]=(i\*10)+j;  
 }  
 }  
 }  
}

```

        System.out.print(matrix[i][j]+" ");
    }
    System.out.println(); }
}

```

```

(iii) public class ComputePower {
    public static void main(String[] args) {
        int x=2;
        int y=Integer.parseInt(args[0]);
        System.out.println(computePower(x, y));
    }
    public static double computePower(x,y)
    {
        double result=0; //initialize result
        for (int i = 0; i < y; i++)
        {
            result=result*x; //compute power
        }
        if(y<0) //if y is negative
            return 1/result;
        else // y is positive
            return result;
    }
}

```

4. Write a java class to represent a bank account. A bank account contains such information as: name of account holder, account number, current balance. The bank account class must contain static information to keep track of the number of account created. You should provide a constructor for the creation of bank account objects. The objects shall have given names, account numbers and with an initial balance of zero. You must keep track of the total number of accounts created as well. Provide methods to deposit and withdraw from the account, these methods should report if the operations are successful and if so, report the new balance after the operations. Finally, provide a method to print out summary of a bank account and a class method that prints out the number of accounts created. Write a user class and create two instances of the bank account class with the appropriate information and display that information. (15 marks)

5. Assume that you have a file named "data.txt" which consist of a line "**the quick brown fox jumps over the lazy dog and the lazy dog got up and barked at the quick brown fox**". Write a java program, TextProcessor.java, which includes readFile( ), retrieveChars( ), findcharOccurrences( ) and printResult( ) are defined as follows:

- **readFile( )** method opens a file named "data.txt" and reads a text from this file and assign to str. Then close the file.
- **retrieveChars( )** retrieves one character (without space) at a time from str using charAt() method and assign to charArr[].
- **findcharOccurrences()** count the number of occurrences of each character using for loop and then count in the charOccurrences[] array.
- **printResult()** shows the characters, words and occurrences of character in the following format.

In the main method, call appropriate methods to generate the following output:

Output format:

The characters:

Thequickbrownfoxjumpsoverthelazydogandthelazydoggotupandbarkedatthequickbrownfox

The Occurrences:

a=6 b=3 c=2 d=5 e=6 f=2 g=3 h=4 i=2 j=1 k=3 l=2 m=1 n=4 o=8 p=2 q=2 r=4  
s=1 t=6 u=4 v=1 w=2 x=2 y=2 z=2

(20 marks)

- 6.(a) Assume there exists a Triangle class which consists of a Triangle (int side1, int side2, int side3) constructor, a isRightAngle( )method which returns true if the triangle is a right-angle triangle, false otherwise. Write a Java program and in your program, declare an array of 10 Triangle and create the Triangle with random side values ranging from 1 to 5 inclusive, and report if the Triangles created are right-angle triangles. (10 marks)
- (b) An employee of accompany has three attributes: name, age, and basic salary. A sales person is a specialized type of employee. Like all other employees, a sales person has the tree attributes plus an additional attribute: commission. In order to develop an application to display the sorted lists of sales person based on the natural ordering of their name, you have to provide the name comparator to be used in the Arrays.sort( ) method. Write a java code segment for such name comparator by using Comparable or Comparator interface.

(10 marks)

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**Department of Technology Promotion and Coordination**  
**University of Computer Studies**  
**B.C.Sc./B.C.Tech. (Second Year)**  
**First Semester Examination**  
**Mathematics of Computing II (CST-202)**  
**March, 2016**  
**Zone IV**

Time allowed: 3 hours

Answer All Questions.

- (a) How many strings of three decimal digits  
 (i) do not contain the same digit three times?  
 (ii) begin with an odd digit?  
 (iii) have exactly two digits that are 4s? (10-marks)
- (b) (i) How many license plates can be made using either three uppercase English letters followed by three digits or four uppercase English letters followed by two digits? (5-marks)  
 (ii) How many permutations of the letters ABCDEFGH contain the string ABC? (5-marks)
- (c) Suppose that a department contains 10 men and 15 women. How many ways are there to form a committee with six members if it must have the same number of men and women? (5-marks)
- (d) What is the coefficient of  $x^8y^9$  in the expansion of  $(3x + 2y)^{17}$ ? (5 marks)
- (e) Consider the following relations on  $\{1, 2, 3, 4\}$ . (10 marks)

$$R_1 = \{(1,1), (1,2), (2,1), (2,2), (3,4), (4,1), (4,4)\}$$

$$R_2 = \{(1,1), (1,2), (2,1)\}$$

$$R_3 = \{(1,1), (1,2), (1,4), (2,1), (2,2), (3,3), (4,1), (4,4)\}$$

$$R_4 = \{(2,1), (3,1), (3,2), (4,1), (4,2), (4,3)\}$$

(f) Which of these relations are reflexive, symmetric, anti-symmetric, transitive?

(g) Express matrix representation of  $R_1, R_2, R_3$  and  $R_3 \circ R_4$ .

(h) Test for exactness and solve the differential equation  $(x^2 + y^2)dx - 2xydy = 0$ . (10-marks)

(i) Solve the linear differential equation  $y' + y \sin x = e^{\cos x}$ ,  $y(0) = -2.5$ . (10-marks)

(j) Find a general solution

$$(i) 10y'' - 32y' + 25.6y = 0. \quad (ii) (D^2 + 4.00D + 3.36I)y = 0$$

(10-marks)

(k) Solve Euler-Cauchy differential equation.

$$(x^2D^2 - xD - 15I)y = 0, \quad y(1) = 0.1, \quad y'(1) = -4.5 \quad (10\text{-marks})$$

(l) Find a second-order homogeneous linear Ordinary Differential Equation for which the given functions are solutions.

(ii) Show linear independence by the Wronskian. (10-marks)

(iii) Solve the initial value problem.  $\cos 5x, \sin 5x, y(0) = 3, y'(0) = -5$  (10-marks)

(m) Solve the equation  $(D^2 + 0.2D + 0.26I)y = 1.22e^{0.5x}$ ,  $y(0) = 3.5, y'(0) = 0.35$ . (10-marks)

**Department of Technology Promotion and Coordination**  
**University of Computer Studies**  
**Second Year (B.C.Sc./B.C.Tech.)**  
**First Semester Examination**  
**Digital System Design I (CST-203)**  
**March, 2016**  
**Zone IV**

**Answer all questions.**

**Time Allowed: 3 hours**

1. (a) For a gated S-R latch, determine the Q and  $\bar{Q}$  outputs for the input in Figure 1(a). Show them in proper relation to the enable input. Assume that Q starts LOW.

(8-marks)

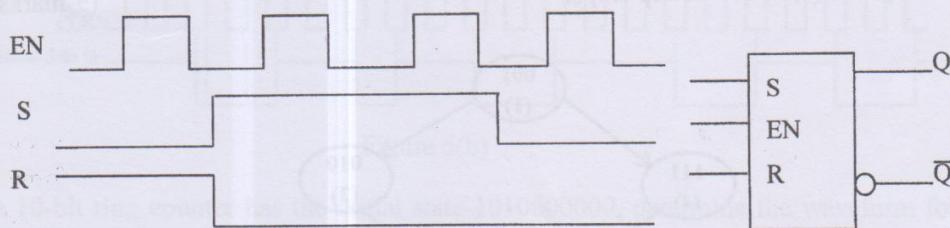


Figure 1(a)

1. (b) Two edge-triggered D flip flops are shown in Figure 1(b). If the inputs are as shown, draw the Q output of each flip flop relative to the clock, and explain the difference between the two. The flip flops are initially RESET.

(8-marks)

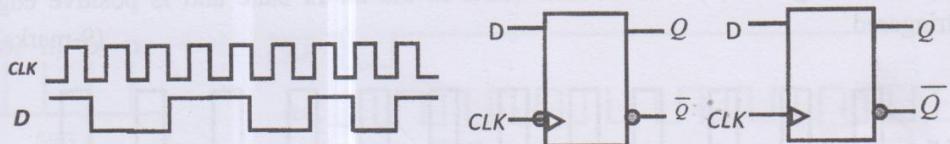


Figure 1(b)

- 2.(a) The Q output of an edge-triggered S-R flip flop is shown in relation to the clock signal in Figure 2(a). Determine the input waveforms on the S and R inputs that are required to produce this output if the flip flop is a positive edge triggered type.

(8-marks)

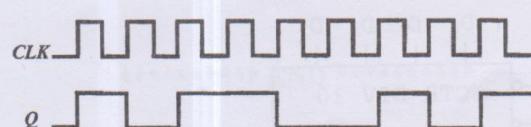


Figure 2(a)

2. (b) For a gated S-R latch, determine the Q and  $\bar{Q}$  outputs for the inputs in figure 2 (b). Show them in proper relation to the enable input. Assume that Q starts LOW.

(8-marks)

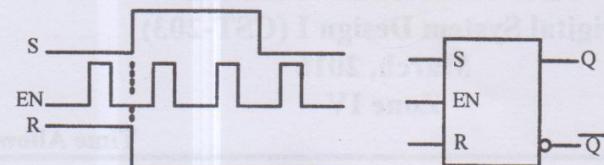


Figure 2 (b)

3. (a) Design a counter with the irregular binary count sequence shown in the state diagram of Figure 3(a). Use J-K flip-flops.

(9-marks)

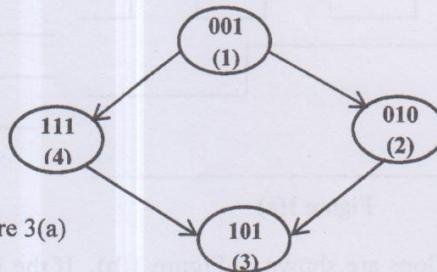


Figure 3(a)

3. (b) Show the timing diagram and determine the sequence of a 4-bit synchronous binary up/down counter if the clock and  $UP/DOWN$  control inputs have waveforms as shown in Figure 3(b). The counter starts in the *all-1s* state and is positive edge-triggered.

(9-marks)

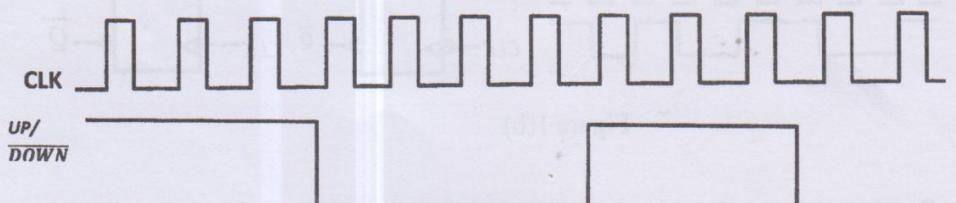


Figure 3(b)

4. (a) Use 74HC190 up/down decade counters as shown in Figure 4(a) connected in the UP mode to obtain 10 kHz waveforms from a 1MHz clock. Show the logic diagram.

(6-marks)

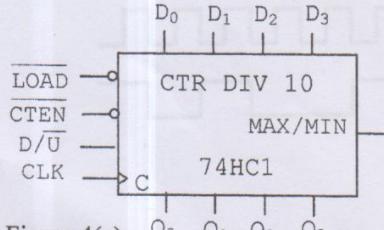


Figure 4(a)

4. (a) Show how an asynchronous counter can be implemented having a modulus- 13 counter with a straight binary sequence from 0000 through 1101. (10-marks)
- 5.(a) Design a logic diagram for a **modulus-10 Johnson counter** and show Timing Diagram for this Johnson counter. (9-marks)
- 5(b) For the serial in/serial out shift register, determine the data-output waveform for the data input and clock waveforms in Figure 5(b). Assume that the register is initially cleared. (9-marks)

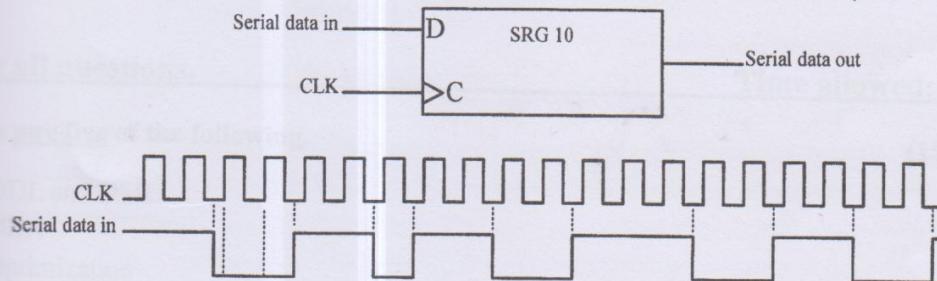


Figure 5(b)

6. (a) If a 10-bit ring counter has the initial state 1010000000, determine the waveform for each of the outputs. (8-marks)

6. (b) The input signals are applied to the 74HC195. Determine the state of the 74HC195 4bit parallel access shift register in Figure 6(b) after each clock pulse. The inputs are  $D_0 = 1$ ,  $D_1 = 0$ ,  $D_2 = 1$ , and  $D_3 = 1$ . The parallel inputs are entered synchronously and RESET the data asynchronously. (8-marks)

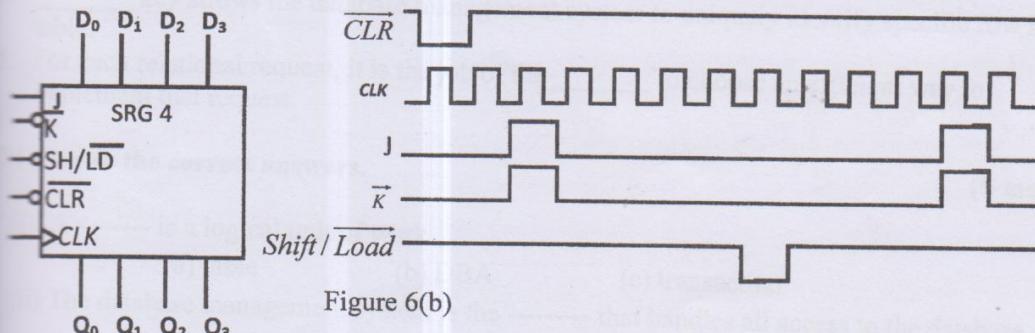


Figure 6(b)

\*\*\*\*\* END \*\*\*\*\*

**Department of Technology Promotion and Coordination**

**University of Computer Studies**

**Second Year (B.C.Sc)**

**CST-204 (Database Management System)**

**First Semester Examination**

**March, 2016**

**Zone IV**

**Answer all questions.**

**Time allowed: 3 hours**

**I. Define any five of the following.**

**(15 marks)**

- (i) DDL and DML
- (ii) DBA
- (iii) Optimization
- (iv) Data dictionary
- (v) Transactions
- (vi) Persistent data

**II. (a) Fill in the blanks.**

**(5 marks)**

1. \_\_\_\_\_ is the smallest unit of the stored data in the relational database.
2. \_\_\_\_\_ is the place where all of the various schema and all of the corresponding mapping are kept.
3. SQL stands for \_\_\_\_\_.
4. \_\_\_\_\_ key allows the database management system to uniquely identify specific row in a table.
5. For each relational request, it is the job of the \_\_\_\_\_ to choose an efficient way to implement that request.

**(b) Choose the correct answers.**

**(5-marks)**

- (i) A ----- is a logical unit of work.  
(a) table                   (b) DBA                   (c) transaction
- (ii) The database management system is the ----- that handles all access to the database.  
(a) hardware               (b) software               (c) user
- (iii) ----- interacts with the system from online workstation or terminals.  
(a) application programmer           (b) database administrator           (c) end user
- (iv) Computerized files such as (name CELLAR) are called -----.  
(a) tables                   (b) columns                   (c) rows
- (v) A ----- supports the definition or declaration of database objective.  
(a) DDL                   (b) DML                   (c) DBA

(c) Match each of the key terms with the definition (a) to (e) that best fits it. (5 marks)

- (1) Heading
- (2) Data administration
- (3) Database Management System
- (4) Body
- (5) Relational Database

- (a) A set of rows that conform to the heading.
- (b) A database that is perceived by its users as a collection of relation variables.
- (c) The software that handles all access to the database.
- (d) A set of column-name: type-name pairs.
- (e) A person who establishes policies for maintaining and dealing with that data once it has been stored.

III. (a) Write the data definition languages for the following:

- (i) Create the following table which contains the following fields and choose the suitable key.

STUDENT (Sid, Sname, ClassName, Major)  
COURSE (Cid, Cname, Credit-Hours, Dept)  
GRADE\_REPORT (Sid, Cid, Grade)

(6 marks)

- (ii) Write a program with embedded SQL statements to list all student details for all students in the major given by the host variable M. (9 marks)

(b) Write SQL statements for the following problems using the tables created in 3(a).

- (i). Change the major description of major number 'M-204' to 'DBMS'.
- (ii). Insert new course ('C502', 'Agent System', 8, 'Software')
- (iii) Delete the record for the student whose name is 'Smith' and class name is 'A'.
- (iv) Get the total numbers of students in each major.
- (v) Retrieve all students' names start with 'N'. (15 marks)

IV. A teacher teaches at least one course. Each course is taught by one teacher, and may be studied by zero or more students. A student must study at least one course, and may study several.

Attributes about teacher, course and student are given below:

Teacher: Tnumber, Tname, Salary, Address;

Course: CourseID, Course-Desc;

Student: StNumber, StName, Address;

Represent this situation of Teacher, Course and Student with E-R diagram.

(15 marks)

V. (a) Here are two sets of FDs for a relvar R [A,B,C,D,E]. Are they equivalent? (5 marks)

- (i) A->B

Date \_\_\_\_\_  
Page No. \_\_\_\_\_

AB->C  
**(5 marks)** D->AC  
 D->E  
 (ii) A->BC  
 D->AE

- (b) Define 1NF, 2NF, 3NF and BCNF. **(8 marks)**
- (c) The following table is used for Employee\_Department information for every employee. **(12 marks)**

**Employee\_Department Table**

EmpNo	FName	LName	DeptNo	DeptName
000290	John	Parker	E11	IS
000320	Ramlal	Mehha	E21	S/W
000310	Maude	Setright	E11	IS
000410	Jones	Smith	E21	S/W

- (i) Find the primary key for this relation and explain your choice.
- (ii) Get the set of FDs for this relation.
- (iii) Is Employee\_Department in 1NF, 2NF, 3NF? Explain why?
- (iv) If Employee\_Department is not in 3NF, normalize it into 3NF relations.

**(15 marks)**

ay be studied  
several.

**(15 marks)**

**(5 marks)**

**Department of Technology Promotion and Coordination**

**University of Computer Studies**

**Second Year (B.C.Sc), First Semester Examination**

**CS-205(Computer Application Techniques II)**

**March, 2016**

**Zone IV**

**Answer all questions.**

**Time allowed- 3:00hours**

- |   |   |
|---|---|
| 1. Write the output string of given JavaScript statements.  | (15 Marks)  |
| (a) var result1 = "Apple"<"orange";<br>var result2 = "Apple".toLowerCase() <<br>"orange".toLowerCase();<br>var result3 = "45" < "5";<br>var result4 = "45" < 5;<br>alert(result1);<br>alert(result2);<br>alert(result3);<br>alert(result4);<br><br>(b) var text="cat,bat,sat,fat";<br>var pattern=/at/g;<br>var matches=pattern.exec(text);<br>alert(matches.index);<br>alert(matches.[0]);<br>alert(matches.lastindex);<br><br>(c) var colors = new Array();<br>var count = colors.push("red", "green");<br>alert(count);<br>count = colors.push("black");<br>alert(count);<br>var item = colors.shift();<br>alert(item);<br>alert(colors.length); | (d) var numbers=[1,2,3,4,5,4,3,2,1];<br>alert(numbers.indexOf(3));<br>alert(numbers.lastIndexOf(4));<br>alert(numbers.lastIndexOf(2,2));<br><br>(e) var person={ };<br>Object.defineProperty(person, "name", {<br>writable: false,value:"Nicholas"});<br>alert(person.name);<br>person.name="Greg";<br>alert(person.name);<br><br>(f) var text= "this has been a short summer";<br>var pattern= /(.)or(.)(..)m(..)/g;<br>if(pattern.test(text))<br>{<br>alert(RegExp.\$1);<br>alert(RegExp.\$2);<br>alert(RegExp.\$3);<br>alert(RegExp.\$4);<br>} |
| 2. Write the JavaScript statement(s) for following.   | (15 marks)  |
| (a) Create an html page with following.(Use array iterative methods)<br>- Create an array with given items (1,2,3,4,5,4,3,2,1).<br>- And then checks some items are greater than 2.If some items are greater than 2, display an alert with "some items are greater than 2". Otherwise "No item is greater than 2".<br>- Each item in the array is multiply by two and store in new array. Display all items of new array of new array with an alert.  |   |
| (b) Create an object named Person with three properties (name, age, job) and two methods name sayAge and sayJob which return the age and job of object with an alert. Create with instance of object with "Nicholas", "29", "Software Engineer". Call methods of the object. (Use Constructor Function)   |   |

2(c) Write JavaScript code that open the new window with web site named <http://www.wrox.com> give the window named "wrox Window". It dimension is 400px X 400px. Open the window at the screen position (10,10) and it can be resizable. Write a function to resize the window to 500 pixels width and 500 pixels height. Write another function to move the window at the screen position (100,100).

3(a) Create an html page with following.

(7 marks)

Write some statements by using the DOM. Write a CSS rule that specify the paragraph with following: (line-spacing: 25px; border-style: double; color: darkblue;)

- Write a function that creates a paragraph element which applies above CSS rule by using DOM. Place the text in this paragraph " The document object is the root node of the HTML document and the "owner" of all other nodes: (element nodes). The document object provides properties and methods to access all node objects, from within JavaScript" by using DOM.

- Create a button to call the above function when user clicked it.

3.(b) Create an html page with following by using the DOM.

(7 marks)

-Write a CSS rule that specify the division with 32 pixels width and 32 pixels height and set red color to background.

-Write a function that create a division element which is 32 pixels width and height and background color is red.(apply above CSS rule)

-Create a button to call above function the display the division when user clicked it.

3.(c)Create an html page with following.

(6 marks)

-Create a frameset document named "main.html" that has two frames, one on the left taking up "50%" of window space and one on the right that use remainder.

-The file name insert for the first frame should "date.html" and the file name for the second frame "time.html".

-In the "date.html", display the current date with following format by using Date object.

4/3/2016

-In the "time.html", display the current time with following format by using Date object.

10:3:25

4.(a)Draw up the balance sheet for Orchid Co.,Ltd with the following information as at 18 December 2007 using the Standard Layout.

(5 marks)

	£
Premises	20000
Motor Vehicle	30000
Stock	12500
Cash	800
Creditors	16550
Bank	2000
Fixture & Fittings	10200
Debtors	24200
Machinery	5150
Drawings	4800
Profits	12000
Bank Loan	21000

Insert the appropriate figure for Capital.

4(b). Draw up the double-entry accounts to record the following transactions, balance off the accounts at the end of month and extract the Trial Balance.

(15 marks)

Oct 6: Owner invested \$ 3,000 cash and \$ 2,000 worth of office furniture into business.

Oct 7: Business sold \$ 2,000 worth of goods on credit to Joy Ltd and another \$ 1,000 worth of goods by cash.

Oct 9: Business purchased \$ 1,500 worth of goods on credit from Rose Ltd.

Oct 10: Joy returned to business \$ 200 worth of stock because the quality is lousy.

Oct 12: Business paid \$ 1,450 to Rose, the remaining balance is the discount received from Rose. Joy paid to business \$ 1,600.

Oct 15: Cash sale of \$ 1,500 was transacted.

Oct 16: Owner withdraws \$ 200 cash for his own personal use.

Oct 17: Business paid for wages \$ 300 and rent of \$ 1,000 by cash.

Oct 21: Business expended by purchasing \$ 1,000 machinery by cash.

Oct 29: Business borrowed from the bank of \$ 4,000 for its extension.

Oct 31: Business paid for bank interest 5% of bank borrowed and electricity \$ 200 by cheque.

4.(c) The following trial balance has been drawn up by an experienced Account clerk, redraft the trial balance with correct entries. (5 marks)

	Dr	Cr
Sale	20726	
Drawing		5400
Creditors		5750
Capital	4827	
Purchase	5365	
Bank		3096
Cash	2400	
Debtors		7400
Sale Return	1270	
Discount Allowed		3940
Discount Received	1000	
Wages		750
General Expense	2340	
Carriage inward		861
Carriage outward		631
Purchase Return	1150	

5.(a). A firm has produced the following trial balance at 31<sup>st</sup> Dec 2015. Prepare the Trading profit and loss account for the year ended and balance sheet at this date. (20 marks)

Trial Balance

	Dr	Cr
	\$	\$
Capital		100,000
Creditors and Debtors	20,000	21,500
Sales and Purchases	58,405	138,430
Fixture and Fittings	35,120	
Motor Vehicles	12,000	
Wages	17,910	
Rent & Rates	3,000	
Premises	101,898	
Lighting & Heating	8,422	
Insurance	1,000	
Motor Vehicles Expenses	2,845	
Accumulated Depreciation:		
Motor vehicles		7,000
Fixture and Fittings		13,500

Provision for bad debt		860
Cash in hand	500	
Cash at bank	4,500	
Bank Loan		8,000
Loan Interest	400	
Discount allowed & received	1,000	1,100
Return In and Return Out	780	900
Drawing	5,210	
Stock at 1 <sup>st</sup> Jan 2013	18,300	
	291,290	291,290

Note:

- (i) Stock at 31st Dec, 2013 was \$20,080.
- (ii) Rent paid in advance \$40.
- (iii) Amount still owed at end of the year were: Insurance \$120, wages \$445.
- (iv) The provision for bad debt is to be increased to 5% of debtors.
- (v) Motor vehicles and Fixtures and Fitting are to be depreciated at 10% on the Net book value using the reducing balance method.

5(b) The trial balance at 31 December 2015 showed a difference of \$200, being a shortage on debit side. A suspense account is opened. At of February 1999 all the errors from previous year were found as follows:

- (1) A cheque of \$50 paid to Mr. A had been correctly entered in the cash book, but had been recorded as \$25 in Mr.A account.
- (2) Total of return in day book, \$425 had not been posted to the Nominal Ledger.
- (3) The discount received from creditors of \$ 250, has not been recorded in the discount received account.
- (4) Sale of \$250 was entered in the sale account as 350.

(7 marks)

and append

**Department of Technology Promotion and Coordination**

**University of Computer Studies**

**Second Year (B.C.Sc)**

**First Semester Examination**

**CS-206 (Software Engineering)**

**March, 2016**

**Zone IV**

(11 marks)

the window  
ion on screen

**Answer all questions.**

**Time allowed : 3hours**

**Software Engineering**

**I. Choose the correct answer from the following:**

1. A set of activities whose goal is the development or evolution of software. (12marks)  
(a) True  
(b) False
2. Software dependability has a range of characteristics, including reliability, security and safety.  
(a) True  
(b) False
3. Software process can be decreased by process standardization where the diversity in software processes across an organization is reduced.  
(a) True  
(b) False
4. Acceptance testing is the first stage in the testing process before the system is accepted for operational use.  
(a) True  
(b) False
5. Non-functional requirements are concerned with the software system to be developed.  
(a) True  
(b) False
6. Data structure that are passed from one sub-system to another.  
(a) True  
(b) False
7. Where the software is checked to ensure that it is what the customer requires.  
(a) Software specification (b)Software development (c)Software validation
8. Software must be usable, without undue effort, by the type of user for whom it is designed.  
(a) Usability (b) Efficiency (c) Dependability
9. The software specification, design and implementation are broken down into a series of increments that are each developed in turn.  
(a) Incremental delivery (b) Spiral development (c) Exploratory development
- .....that shows the object classes used in the system and their dependencies.  
(a)A structural model (b) An object model (c) A sequence model
11. These requirements specify product behavior.  
(a)Product requirements (b) Organizational requirements (c) External requirements

12. ....are statements, in a natural language plus diagrams, of what services the system is expected to provide and the constraints under which it must operate.  
(a) System requirements (b) User requirements (c) Domain requirements

**II. Define the following terms:**

1. What is the difference between software engineering and computer science? (9 marks)
2. What are software engineering methods?
3. Describe the three types of categories of CASE tools.
4. Describe the three types perspective of RUP.
5. What are natural language specifications that can be confusing and hard to understand?
6. Describe the three types of non-functional requirements.

**III.(i) What is software engineering? Briefly explain about them.**

(ii) Describe types of software process models. (5 marks)

**IV.(a)Three problems can arise when user requirements are written in natural language sentences, briefly explain about it.**

(b) Define the waterfall model of fundamental development activities. (10 marks)

**V. Describe the three types of interface.**

**System Analysis and Design (SAD)**

**I. Match each of the key terms with the definition (a to h) that best fits it.**

1. System planning and selection
  2. Modularity
  3. Environment
  4. Close-ended questions
  5. Boundary
  6. Informal system
  7. Constraint
  8. JAD session leader
- a. The way a system actually works.
  - b. The line that marks the inside and outside of a system and that sets off the system from its environment.
  - c. The trained individual who plan and lead joint application design sessions.
  - d. Dividing a system up into chunks or modules of a relatively uniform size.
  - e. Questions in interview and on questionnaires that as those responding to choose from among a set of specified responses.
  - f. A limit to what a system can accomplish.

- em is  
arks)
- g. The first phase of SDLC, in which an organization's total information system needs are analyzed and arranged, and in which a potential information system projects is identified and an argument for continuing or not continuing with the project is presented.  
h. Everything external to a system that interacts with the system.

III. Define the following terms:

- (i) Coupling
- (ii) System
- (iii) Interrelated component
- (iv) Purpose

(6 marks)

- IV. (a) What method is used to capture user requirements in concrete form to system analysts? Illustrate this method. (5 marks)  
(b) Explain Business Process Reengineering (BPR) and how affects requirement determination. (5 marks)  
(c) (a) Briefly describe the four system concepts that analysts need to know. (5 marks)  
(b) Explain about the Long-Held Organizational Rules that are being eliminated through Disruptive technologies. (10 marks)

Hoosier Burger

Juan Rodriguez has assigned you the task of requirements determination for the Hoosier Burger. You are looking forward to this opportunity because it will allow you to meet and interact with Hoosier Burger employees. Besides interviewing Bob and ThelmaMellankamp, you decide to collect information from Hoosier Burger'swaiters, cooks, and customers.

Mr.Rodriguez suggests that you formally interview Bob and Thelma Mellankamp and perhaps observe them performing their daily management tasks. You decide that the best way to collect requirements from the waiters and cooks is to interview and observe them. You realize that discussing the order-taking process with Hoosier Burger employees and then observing them in action will provide you with a better idea of where potential system improvements can be made. You also decide to prepare a questionnaire to distribute to Hoosier Burger customer .Because Hoosier Burger has a large customer base, it would be impossible to interview every customer, therefore, you feel that a customer satisfaction survey will suffice.

- (a) Assume you are preparing the customer satisfaction questionnaire. What types of question would you include? What are the major advantages for it?
- (b) What modern requirement determination methods are appropriate for this project?
- (c) Describe the types of documents and what types of documents are appropriate for this project?

(9 marks)

**Department of Technology Promotion and Coordination**  
**University of Computer Studies**  
**Second Year (B.C.Tech), First Semester Examination**  
**CT-205(Computer Application Techniques II)**

March, 2016

Zone IV

**Answer all questions.**

**Time allowed- 3:00hours**

1. Write the output string of given JavaScript statements.

(30 Marks)

<pre>(a) var numbers=[1,2,3,4,5,4,3,2,1]; alert(numbers.indexOf(4)); alert(numbers.lastIndexOf(4));  alert(numbers.indexOf(4)); alert(numbers.lastIndexOf(4, 4));</pre>	<pre>(b) var r1=5, r2="5",r3=5; var result1,result2,result3,result4; result1=r1+r2; alert(result1); result2=r1+r2; alert(result2); result3="The sum of r1 and r3 is "+r1+r3; alert(result3); result4="The sum of r1 and r3 is "+(r1+r3); alert(result4);</pre>
<pre>(c) function addTen(num) {     num+=10;     return num; }  var count=20; var result=addTen(count); alert (count); alert (result);</pre>	<pre>(d) function howManyArgs() {     alert(arguments.length); }  howManyArgs("KoKo",20); howManyArgs(); howManyArgs(20);</pre>
<pre>(e) &lt;form method="post" " id="myForm"&gt; &lt;ul&gt; &lt;li&gt;&lt;input type="radio" name="color" value="red"&gt;Red&lt;/li&gt; &lt;li&gt;&lt;input type="radio" name="color" value="green"&gt;Green&lt;/li&gt; &lt;li&gt;&lt;input type="radio" name="color" value="blue"&gt;Blue&lt;/li&gt; &lt;/ul&gt; &lt;/form&gt; &lt;script type="text/javascript"&gt; (function(){ var form = document.getElementById("myForm"); var colorFields = form.elements["color"]; alert(colorFields.length);</pre>	<pre>(f) &lt;html&gt; &lt;head&gt;&lt;title&gt;My Site&lt;/title&gt;&lt;/head&gt; &lt;body&gt; &lt;div class="hd"&gt; &lt;h1&gt;Computer University&lt;/h1&gt; &lt;ul&gt;     &lt;li&gt;First Year&lt;/li&gt;     &lt;li&gt;Second Year&lt;/li&gt;     &lt;li&gt;Third Year&lt;/li&gt; &lt;/ul&gt; &lt;/div&gt; &lt;script type="text/javascript"&gt; var c1=document.body.firstChild; alert(c1.tagName); var c2=document.body.firstChild.nextSibling;</pre>

<pre> var firstColorField = colorFields[0]; var firstFormField = form.elements[0]; alert(firstColorField.value); alert(firstColorField === firstFormField);  })0; &lt;/script&gt; </pre>	<pre> mentSibling; alert(c2.tagName); var c3=document.body.lastElementChild; alert(c3.tagName); var c4=document.body.lastElementChild.previousElementSibling; alert(c4.tagName); &lt;/script&gt; &lt;/body&gt; &lt;/html&gt; </pre>
<pre> (g) var person = {}; Object.defineProperty(person, "name", { writable: false, value : "Nicholas" }); alert(person.name); person.name = "Greg"; alert(person.name); </pre>	<pre> (h) var age=29; window.color="red"; delete window.age; delete window.color; alert (window.age); alert (window.color); </pre>
<pre> (i) var colors = ["red", "green", "blue"]; var colors2 = colors.concat("yellow",[black", "brown"]); alert (colors); alert(colors2); </pre>	<pre> (j) var stringValue="yellow"; alert (stringValue.localeCompare("brick")); alert stringValue.localeCompare("yellow"); alert (stringValue.localeCompare("zoo")); </pre>
<pre> (k) &lt;div id = "content"&gt; &lt;p&gt;This is a&lt;strong&gt;paragraph&lt;/strong&gt;with a list following it.&lt;/p&gt; &lt;ul&gt; &lt;li&gt; Item I&lt;/li&gt; &lt;li&gt; Item II &lt;/li&gt; &lt;li&gt; Item III &lt;/li&gt; &lt;/ul&gt; &lt;/div&gt; &lt;script type = "text/javascript"&gt; var div = document.getElementById("content"); alert(div.innerHTML); &lt;/script&gt; </pre>	<pre> (l)&lt;script type="text/javascript"&gt; function Person( ){ } Person.prototype.name="Nicholas"; Person.prototype.age=29; Person.prototype.job="Software Engineer"; Person.prototype.sayName=function() {     alert (this.name); };  var person1=new Person( ); var person2=new Person( ); person1.name="Greg"; alert (person1); alert (person2); delete person1.name; alert (person1); </pre>

2 Write the JavaScript statement(s) for followings. (25 marks)

(a) Create an HTML page with following.

- Create an array with the following text: "History", "Psychology", "Philosophy"
- Create an array with the following text:  
"Physics", "Chemistry", "Biology", "Economy", "Mathematics", "Computer"
- Concatenate these two arrays into a "subject" array.
- Display the "subject" array on document.
- Create a random integer to get a random integer to access the item of subject array.
- Display the random text of array with alert.

(b) Write the dynamic script by using the DOM to specify JavaScript code is inline as in this example: <script type = "text/javascript" src = "client.js"></script>

(c) Create a function named website() that pops up alert says, "Welcome to My Site". And then execute this function at every 10 seconds. Create another function that stop the endless calling of website() function. Create another function named new\_window() that opens a new window with <http://www.google.com> and give the window named "wroxWindow".

(d) Create an HTML page which use the EventUtil object in EventUtil.js file in previous mentioned. In this page, create a button "Display" that alert "Hello World" When user clicked it. Create another button "Remove" that remove the event handler of previous button when user clicked it.

(e) Create an html page that will load the external javascript file (example.js). When the file has been loaded, displays an alert "Loaded!" Use the cross-browser EventUtil object in EventUtil.js file. Both files have already existed in your folder.

3.(a) Create an HTML page with the following. (7 marks)

In this page, use the regular expression to validate the name and email address that the viewer entered with prompt.

(i) Assume that you need the name contain the following:

- It must begin Mg or Ma and it has at least white space. Followed by letters.

(ii) Assume that you need email address contain the following format:

- It must begin a letter or number. It has a letter, number or underscore.
- This type of character occurs at least twice. The at @ sign required.
- The letters, number, and the hyphen (-) occurs at least three characters.
- The dot(.) sign required. The letter occur exactly three characters

If Name and email address validate, send an alert saying "Information valid". Otherwise send an alert saying "Information invalid: Try again".

3.(b) Create an html page with following. (7 marks)

- Create a function named sayhello() that pops up alert says, "Hello." And then wait 10 seconds before attempting to execute the code.
- Create another function 'cancelhello()' that cancels the calling of 'sayhello()' function . Call this function by clicking button 'Cancel Hello'.

3.(c) Create an html page with following. (By using array iterative methods) (6 marks)

- Create an array with given items (1, 2, 3, 4, 5, 4, 3, 2, 1).
- And then checks each item is greater than 2. If every item is greater than 2, display an alert with "Every item is greater than 2." Otherwise "Every item is not greater than 3."
- Each item in the array is multiply by two and store in new array. Display all items of new array with an alert.

- 4.(a) Create an html page with following. (Write the code by using DOM.) (7 marks)
- create an empty unordered list.
  - create a function that creates a document fragment node with following list item and append the document fragment node to unordered list.
    - Book
    - Pencil
    - Eraser
- call the function when user clicks the “Add items” button.
- 4.(b) Create two HTML pages with the following. (11 marks)
- The First page:
- Create a function named new\_window () that opens a new window with text1.html and the window named is “win\_open”. Give it dimension of 300x200 pixels and give it an initial position on screen of (30,30). Also give it status bar and a menu bar.
- Create a button that call the new\_window () function when click to open a new window Label is “Open Window”.
- The Second page :( text1.html)
- Define a single function called “handler” to handle three different events: click, mouseover, mouseout. This function is able to determine which event occurred and then react appropriately. When the button is clicked; it should pop up an alert “Clicked”. When the mouse is moved over the button, the background color should change to orange. When the mouse is moved from button, the background color should revert to its default.
- Create a button and add events: click, mouseover and mouseout by DOM event object.

- 4.(c) Create an HTML page with following. (7 marks)
- Define a single function called “handler” to handle three different events: click, mouseover and mouseout. This function is able to determine which event occurred and then react appropriately. When the button is clicked, it should pop up an alert “Clicked”. When the mouse is moved over the button, the background color should change to red. When the mouse is moved away from the button, the background color should revert to its default.
  - Create a button and add events: clicks, mouseover and mouseout by DOM event object.

**Department of Technology Promotion and Coordination**  
**University of Computer Studies**  
**Second Year (B.C.Tech.)**  
**First Semester Examination**  
**Electrical Circuits I (CT-206)**

March, 2016

Zone IV

**Answer All Questions**

**Time Allowed: 3 hours**

1. (a) Find the power absorbed by each element in the circuit in Figure 1(a). Verify the sum of the absorbing power is equal to zero. (10 marks)

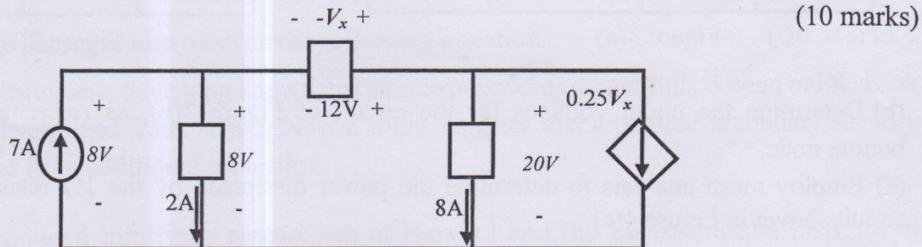


Figure 1(a)

- (b) The current waveform depicted in Figure 1(b) is characterized by a period of 4s. (i) What is average value of the current over a single period? (ii) Compute the average current over the interval  $1 < t < 3$ s. (iii) If  $q(0) = 1\text{C}$ , sketch  $q(t)$ ;  $0 < t < 4$ s. (10 marks)

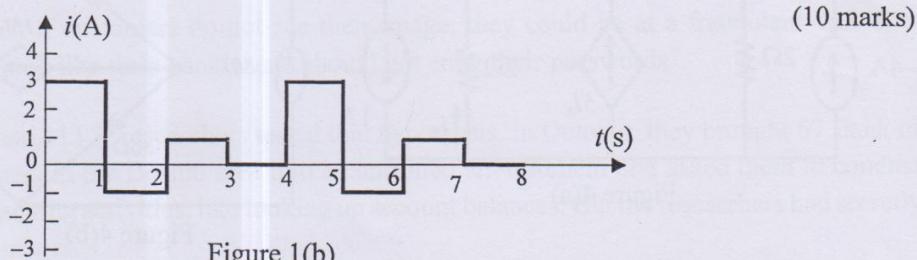


Figure 1(b)

2. (a) For the single-node-pair circuit of Figure 2(a), find  $i_A$ ,  $i_B$ , and  $i_C$ . (10 marks)

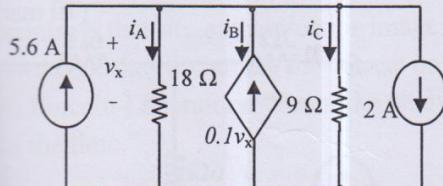


Figure 2(a)

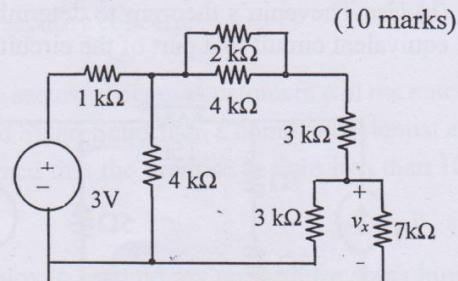


Figure 2(b)

- (b) In the circuit of Figure 2(b), only the voltage  $v_x$  is of interest. Simplify the circuit using appropriate resistor combinations and iteratively employ voltage division to determine  $v_x$ . (10 marks)

3. (a) Employing resistance combination and current division as appropriate, determine values for  $i_1$ ,  $i_2$ ,  $V_{6\Omega}$  and  $V_{2\Omega}$  in the circuit of Figure 3(a).  
 (10 marks)

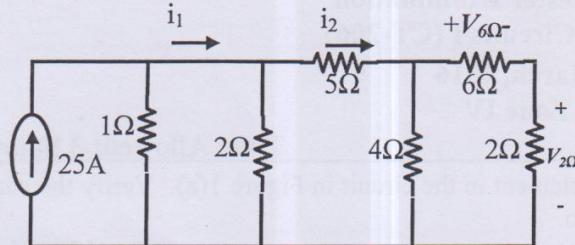


Figure 3(a)

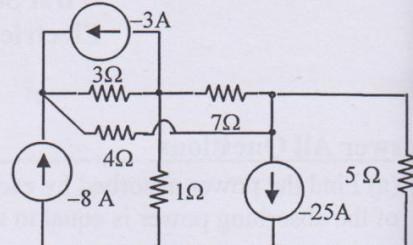


Figure 3(b)

- (b) Determine the nodal voltages for the circuit of Figure 3(b), as referenced to the bottom node.  
 (10 marks)
4. (a) Employ mesh analysis to determine the power dissipated by the  $1\Omega$  resistor in the circuit shown in Figure 4(a).  
 (10 marks)
- (b) Determine  $v_3$  in the circuit of Figure 4(b).  
 (10 marks)

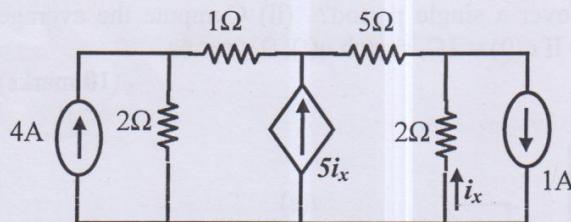


Figure 4(a)

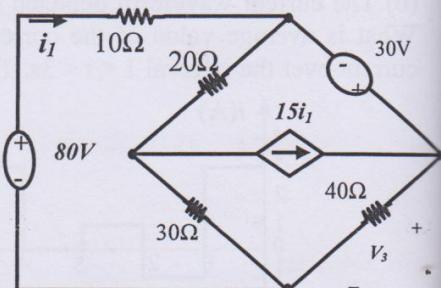


Figure 4(b)

5. (a) For the circuit of Figure 5(a) use superposition to compute the current  $i_x$ .  
 (10 marks)
- (b) Use Thevenin's theorem to determine the Thevenin's equivalent circuit and Norton's equivalent circuit that part of the circuit in Figure 5(b) to the left of  $R_L$ .

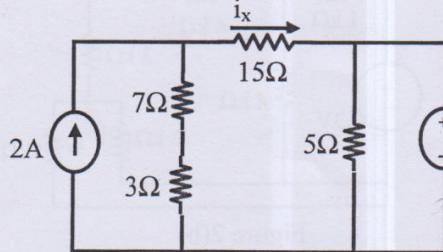


Figure 5(a)

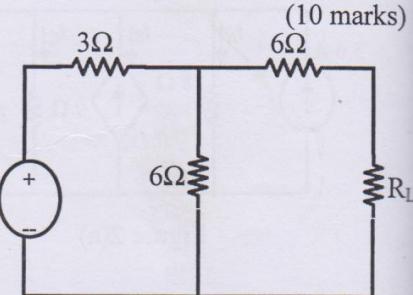


Figure 5(b)