

So the typewriter was not a new idea, although there had not been a successful realisation of the idea before Christopher Sholes' machine. His typewriter became very popular, and soon people learned to type very quickly - so quickly, in fact, that the keys became tangled. On manual typewriters the characters were set on the end of bars which rose to strike the paper when the key was pressed. In the first models, the keys were set alphabetically. When a quick typist tapped out a word like *federal*, it was very likely the adjacent *e* and *d* keys would become entangled.

Sholes therefore set about finding ways to slow the typist down. He looked for the letters which were most often used in English, and then placed them far away from each other. For instance, *q* and *u*, which are almost always used together in English, are separated by five intervening letters. The plan worked, and the typist was slowed down a little.

When computers came into use in the latter part of the twentieth century it was suggested that the keyboard should be rationalised. After all, there was no longer any need to avoid clashing manual typewriter keys. One new board included keys which produced letters which frequently occur together in English, like *ing* and *th* and *ed*, so the word *thing* would take two strokes to write instead of five. Although this made perfect sense, people found it very hard to learn to use a new keyboard, and the idea was dropped. It is unlikely that the keyboard will ever be changed: as we approach the twenty-first century the voice-activated computer, already in an advanced state of development, is becoming more and more accessible. It is very likely that we will soon have machines which take dictation as we speak to them, and the keyboard will be used for corrections.

### Questions 1-5

Write the appropriate letters **A-D** in box on your answer sheet for the following statements **1-5**.

**You can use your answer more than once.**

1. Sundback's zipper
2. the development of nylon
3. the development of velcro
4. the development of the first typewriter-like machine
5. the development of the voice-activated computer

A - before the nineteenth century
B - during the nineteenth century
C - in the first half of the twentieth century
D - at the end of the twentieth century

### Questions 6-10

Write on your answer sheet **'TRUE, FALSE or NOT GIVEN'** for the following statements.

6. The first zipper was successful as a fastener.
7. Velcro is another product made from nylon.
8. The first typewriter's keyboard was different to the modern keyboard.
9. The keys of Sholes' first machine were likely to jam.
10. New computers will use the rationalised keyboard.

### Question II

(A). Complete these sentences with **"mustn't"** or **"don't/ doesn't/ didn't have to"**. **(10-marks)**

1. I can stay in bed tomorrow morning because I \_\_\_\_\_ go to work.
2. Whatever you do, you \_\_\_\_\_ touch that switch. It's very dangerous.
3. He \_\_\_\_\_ wear a suit to work but he usually does.
4. Smoking is forbidden in the factory. So you \_\_\_\_\_ smoke in it.
5. I went to the bank this morning. There was no queue, so I \_\_\_\_\_ wait.
6. My mother said me, "You \_\_\_\_\_ be late if you go outside".
7. I \_\_\_\_\_ make more effort if I study regularly.

8. Don't make so much noise. We \_\_\_\_\_ wake the baby.
9. You \_\_\_\_\_ be a good player to enjoy a game of tennis.
10. I don't want anyone to know. You \_\_\_\_\_ tell anyone.

(B). Rewrite each sentence below using a phrasal verb from the box in a correct tense. You have to write each sentence by changing the objective noun to a pronoun. (10-marks)

give out      take on      set up      keep down      make out
--

1. It was hard to see the cruise ship through the fog.
2. Could you help me to distribute some leaflets for the passenger?
3. The manager reduced the number of employees and added working hours.
4. My father started the holiday company in 1967.
5. We'll have to employ extra staff when it's high season.

### Question III

(A). Rewrite the sentences using phrases from the box and making any other necessary changes. (10-marks)

to pull down a building	a bungalow
to move house	a semi-detached house
to rent out a house	a terraced house
to put someone up	a spacious house

1. My aunt is very happy to allow students to have the flat for a reasonable amount.
2. The council is demolishing the old cinema.
3. I live in a house which only has one floor.
4. Her house is connected to another house.
5. John lived in five different houses when he was a child.

(B). Match each word with the appropriate explanations from the box. (10-marks)

1. migration
2. elevation
3. settlement
4. emigration
5. disturbance
6. immigration
7. assimilation
8. crash
9. destination
10. interaction

a. becoming similar to a country's native inhabitants b. mutual or reciprocal action or influence c. moving from one country to another d. moving away from one's home country e. an accident involving vehicles f. the act of preventing something from happening g. a place to which a person is going or something is being sent h. making a permanent home in a country i. the state of floating in the air j. moving into another country
---

#### Question IV

(A). Answer the following questions in **complete sentences with meaningful sense**. (10-marks)

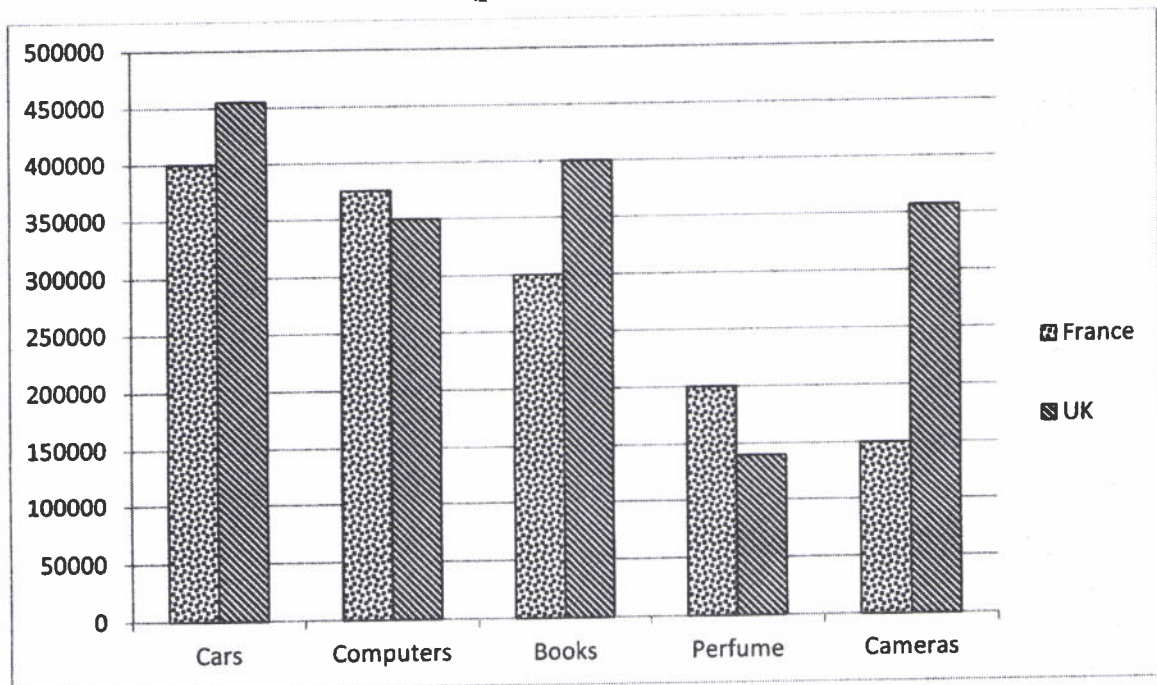
1. What would your ideal room be like?
2. How do you spend your free time?
3. Which types of transportation do people in your country often use to move?
4. What makes a good tourist?
5. What time in the morning would you get up if you could choose?

(B). The chart below shows the expenditure of two countries on consumer goods in 2010. Summarize the information by selecting and reporting the main features and make comparisons where relevant.

Write at least 150 words.

(10-marks)

**The Chart below shows the expenditure of two countries on consumer goods in 2010 (pounds sterling)**



#### Question V

Write about the following topic:

(20-marks)

If countries are serious about solving traffic problems, they should tax private cars very heavily and use the money to provide free or very cheap rail travel.

To what extent do you agree with the above?

Write at least 250 words.

----- *End of Questions* -----

**Department of Higher Education**  
**University of Computer Studies, Hinthada**  
**SecondYear(B.C.Sc./B.C.Tech.)**  
**Final Examination**  
**Advanced Java Programming (CST-201)**  
**September 2018**

**Answer All Questions.**

**Time Allowed: 3 Hours**

1. Choose the correct answer.

**(10 marks)**

- (i) Many of Java's networking classes are contained in package -----.  
A. java.io                      B. java.awt                      C. java.socket                      D. java.net
- (ii) ----- exception occurs when a host name indicated by a client cannot be resolved to an address.  
A. UnknownHostException                      B. IOException  
C. RemoteException                      D. SocketException
- (iii) EJB stands for  
A. Entity Java Bean                      B. Enterprise Java Bean  
C. Environment Java Bean                      D. Exception Java Bean
- (iv) ----- catches an exception thrown by JSP elements in JSTL.  
A. <c:exception/>                      B. <c:catch/>                      C. <c:try/>                      D. All of them
- (v) The default parameter of the setMaxAge() is  
A. positive value                      B. negative value                      C. zero                      D. boolean value
- (vi) The attribute used in <jsp:include/> are -----.  
A. page                      B. file                      C. type                      D. id
- (vii) JSP page can only generate dynamic contents.  
A. true                      B. false
- (viii) Which of the following is used generally for reading the content of database?  
A. Boolean execute()                      B. int executeQuery()  
C. ResultSet executeQuery()                      D. ResultSet executeUpdate()
- (ix) Which method is invoked in only one time in the life cycle of a servlet?  
A. init()                      B. service()                      C. doGet()                      D. doPost()
- (x) Which of the following attribute is used to have uncaught run-time exceptions automatically forwarded to an error processing page?  
A. error                      B. errorPage                      C. exception                      D. exceptionPage
2. Write a Client-Server program to print the factorial of a number using socket. The Client accepts a number from the user and sends it to the Server. Then the Server calculates the factorial of the number and returns the result back to the client. And then result is displayed in client side.  
**(15 marks)**
3. Complete the following RMI programs. **(15 marks)**

```
/*RectangleInterface.java*/
```

```
import java.rmi.*;
public interface RectangleInterface extends ----(i)-----
{
    public double Area(int width, int height) throws -----(ii)-----;
    public double Perimeter(int width, int height) throws -----(iii)-----;
}
```



/\*RectangleServer.java\*/

```
import java.rmi.*
import----(iv)-----;
import----(v)-----;
public class RectangleServer extends ----(vi)----- implements ----(vii)-----{
    RectangleServer () throws ----(viii)-----{
        super();
    }
    public double Area(int width, int height) throws ----(ix)-----{
        return----(x)-----;
    }
    public double Perimeter(int width, int height) throws ----(xi)-----{
        return----(xii)-----;
    }

    public static void main(String args[]){
        RectangleServer obj= new RectangleServer();
        Naming.rebind("rmi://localhost:1099/recObj" , obj);
    }
}
```

/\*RectangleClient.java\*/

```
import java.rmi.*;
import java.net.*;
public class RectangleClient{
    public static void main(String []args) throws Exception{
        RectangleInterface remoteObj;
        remoteObj=----(xiii)-----;
        System.out.println(" Area= " + ----(xiv)----- (20,30) );
        System.out.println(" Perimeter= " + ----(xv)----- (20,30) );
    }
}
```

4. Suppose you have to develop the Online Student Registration System. Create a registration form about Student that contains Student Name, Email, Gender, Year (First Year to Fifth Year) and Hobby.

Student Registration Form	
Please fill student information:	
Student Name:*	<input type="text"/>
E-Mail:*	<input type="text"/>
Gender:*	<input checked="" type="radio"/> Male <input type="radio"/> Female
Year:*	First Year <input type="button" value="v"/>
Interesting Subject:*	<input checked="" type="checkbox"/> J2EE <input type="checkbox"/> PHP <input type="checkbox"/> ASP.NET
<input type="button" value="Register"/> <input type="button" value="Cancel"/>	

When the user submits the information from first form, the system will generate unique student id and save the request information to ArrayList as Student object (ArrayList<Student>) in same session. After saving each student record, all the students information stored in this session will be displayed as shown in figure below. You can use Cookies or Session if you need to keep track of the Student ID and student information.

```
Student ID      : ID1
Student Name   : SiThu
Email          : sithu@gmail.com
Gender         : male
Year           : Second Year
Interesting Subject : J2EE/PHP
```

When submits the second form information, display as follows and so on:

```
Student ID      : ID1
Student Name   : SiThu
Email          : sithu@gmail.com
Gender         : male
Year           : Second Year
Interesting Subject : J2EE/RHP
*****
Student ID      : ID2
Student Name   : MayThu
Email          : maythu@gmail.com
Gender         : female
Year           : First Year
Interesting Subject : PHP/ASP.NET
```

To do so, you need to create bean class(Student.java) with required fields. And then write web.xml. **(25 marks)**

5. Create Draw Table Form using JSP, your system should have the following pages:

(i) "index.html", your welcome page is displayed as the following form:

### Draw Table Entry

Rows	5
Columns	2
Draw	

(ii) "drawTable.jsp", when you submit the "Draw" button, sample table entry is shown in the following:

**Sample Table Entry**


(iii) and **“showError.jsp”** to handle error in **“drawTable.jsp”** .

**(10 marks)**

6. Write a web application to order Pizza. Pizza Order Form is shown in figure below.

Get form parameters, and save the request information to database named as **“dbOrder”** and table named as **“Order”** table using Servlet or JSP and JDBC. Assume that the fields of the **“Order”** table are **Name, Order\_Type, Pizza\_Type, Address**. Display the orders information from **“Order”** table as tabular form. **(15 marks)**

7. Write a jsp page with the following features using JSTL. Firstly, create a **salary** variable with the value of **“200000”** in session scope. And then output the salary variable as shown below. The following condition will decide that whether the salary is good or not. If the *salary is less than and equal to zero*, the output message is *“Salary is very low to survive!”*. And if the *salary is greater than 100000*, the output message is *“Salary is very good!”* and the *default* message is *“No Comment!”*. Print result as below:

<p><i><b>Your salary is 200000.</b></i></p> <p><i><b>Salary is very good!</b></i></p>
---

**(10 marks)**

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



**Department of Higher Education**  
**University of Computer Studies, Hinthada**  
**Second Year (B.C.Sc./ B.C.Tech.)**  
**Final Examination**  
**Mathematics of Computing II (CST-202)**  
**September, 2018**

**Answer All Questions.**

**Time Allowed: 3 Hours.**

1. (a) Find the inverse transform  $f(t)$  if  $F(s) = \frac{4s+32}{s^2-16}$ .
- (b) Represent  $t - 2$  ( $t > 2$ ) using unit step functions. Find its transform. Show the details of your work.
- (c) Solve the initial value problem  $y'' + 6y' + 8y = e^{-3t} - e^{-5t}$ ,  $y(0) = y'(0) = 0$  by the Laplace transform.
2. (a) Find the inverse transform  $f(t)$  if  $F(s) = \mathcal{L}(f(t)) = \frac{5.5}{(s+1.5)(s-4)}$  by using convolution.
- (b) Express the repeating decimal 5.23 23 23 ... as the ratio of two integers.
- (c) Write out the first few terms of the series  $\sum_{n=0}^{\infty} \left( \frac{1}{2^n} + \frac{(-1)^n}{5^n} \right)$ . Then find the sum of the series.
- (d) Use the Limit Comparison Test to determine the series  $\sum_{n=1}^{\infty} \frac{2n+1}{n^2+2n+1}$  converges or diverges.
3. (a) Use the Ratio Test to determine the series  $\sum_{n=1}^{\infty} \frac{2^n}{n!}$  converges or diverges.
- (b) Use the alternating series test to determine the series  $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{n}{n^3+1}$ .
- (c) Find the Maclaurin series for the function  $e^{-x}$ .
- (d) Find the equation for the line tangent to the curve for  $x = \sec t$ ,  $y = \tan t$  at the point  $(\sqrt{2}, 1)$  where  $t = \frac{\pi}{4}$ .
4. (a) The parabola  $y^2 = 8x$  is shifted down 2 units and right 1 unit to generate the parabola  $(y + 2)^2 = 8(x - 1)$ .
- (i) Find the new parabola's vertex, focus and directrix.
- (ii) Plot the new vertex, focus, directrix and sketch in the parabola.
- (b) Find the hyperbola's standard form equation from the vertices:  $(\pm 3, 0)$ , asymptotes:  $y = \pm \frac{4}{3}x$ .
- (c) Find the focus and directrix of the parabola  $x^2 = -6y$ .
5. (a) Find (i) the direction of  $\overrightarrow{P_1P_2}$  and
- (ii) the mid-point of the line segment  $P_1P_2$  where  $P_1(-1, 1, 5)$  and  $P_2(2, 5, 0)$ .
- (b) Find the length and direction of  $\vec{u} \times \vec{v}$  and  $\vec{v} \times \vec{u}$  where  $\vec{u} = -8\hat{i} - 2\hat{j} - 4\hat{k}$ ,  $\vec{v} = 2\hat{i} + 2\hat{j} + \hat{k}$ .



**Department of Higher Education**  
**University of Computer Studies**  
**Second Year (B.C.Sc. / B.C.Tech.)**  
**Final Examination**  
**Advanced Data Structure (CST-203)**  
**September 2018**

**Answer All Questions.**

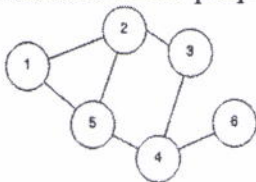
**Time Allowed: 3 Hours**

**1. Choose the correct answers of the following questions.**

**(15 Marks)**

- (i) The insertion sort is the best of other sort, \_\_\_\_\_ as fast as the bubble sort.  
(A) once (B) twice (C) three times (D) four times
- (ii) How many recursive calls for the recursive function triangular (5)?  
(A) 1 (B) 4 (C) 5 (D) 6
- (iii) Which data structure is used in depth first search of a graph to hold the nodes?  
(A) Stack (B) Queue (C) Tree (D) Array
- (iv) Maximum number of leaf nodes in full binary tree with height  $h=4$  is \_\_\_\_\_ .  
(A) 4 (B) 7 (C) 8 (D) 9
- (v) The bubble sort is the \_\_\_\_\_ algorithms.  
(A) simplest (B) complex (C) average (D) none of them
- (vi) Merge sort requires \_\_\_\_\_ time.  
(A)  $O(N)$  (B)  $O(N^2)$  (C)  $O(\log N)$  (D)  $O(N \log N)$
- (vii) In a binary tree, a node has at most \_\_\_\_\_ children.  
(A) no child (B) one (C) three (D) two
- (viii) The advantages of hash table are \_\_\_\_\_.  
(A) quick moving and quick sorting (B) quick moving and quick searching  
(C) quick insertion and quick searching (D) quick copying and quick searching
- (ix) A \_\_\_\_\_ transforms a range of key values into a range values into a range of index values.  
(A) tree (B) heap (C) hash function (D) linked-list
- (x) An adjacency matrix is a \_\_\_\_\_ dimensional array.  
(A) one (B) two (C) three (D) none of them
- (xi) In binary tree, each node has a key less than its parents and \_\_\_\_\_ than its children.  
(A) less (B) equal (C) greater (D) none of them
- (xii) A hash table is based on \_\_\_\_\_.  
(A) array (B) stack (C) queue (D) linked list
- (xiii) Secondary clustering occurs because \_\_\_\_\_.  
(A) many keys hash to the same location (B) the sequence of step lengths is always the same  
(C) too many items with the same key are inserted (D) the hash function is not perfect
- (xiv) An inorder traversal visits nodes in order of \_\_\_\_\_ keys.  
(A) equal (B) descending (C) ascending (D) vice versa
- (xv) A node is always removed from the \_\_\_\_\_ in a heap sort.  
(A) left child (B) right child (C) last (D) root
2. (a) Write an algorithm that sorts the given data using selection sort. **(5 Marks)**  
(b) Trace by hand the sorting of the array into a  $[ ] = \{44,77,66,55,11,99,33,88,22\}$  by the selection sort algorithm. **(7 Marks)**  
(c) Describe the efficiency of selection sort? **(3 Marks)**

3. (a) Write an algorithm `recMerge ( )` that carried out the merging the two sorted arrays. **(5 Marks)**  
 (b) Suppose that we have two sorted arrays, array A has 4 elements (25,49,82,99) and array B has 6 elements (8,16,40,55,67,75). They will be merged into an array C that starts 10 empty cells. Trace merging of two arrays by showing the step of comparisons necessary to determine which element will be copied? **(8 Marks)**  
 (c) What is the base case in recursive functions? **(2 Marks)**
4. (a) Write the code for `inorder ( )` that traverse the binary search tree in inorder. **(5 Marks)**  
 (b) Draw the binary search tree, whose elements are inserted in the following order 55,47,68,25, 49,59,11,29,62,27,30,60,65. And then (i) Find the node 11 in tree (ii) Insert a new node 9 into tree (iii) Delete the node 30 from tree (iv) State the internal memory representation of tree using sequential representation (Array-based Representation). **(10 Marks)**
5. (a) Define open addressing. Describe three methods of open addressing. **(5 Marks)**  
 (b) Given input {4371,1323,6173,4199,4344,9679,1989,4172,1988,1325} and a hash function  $h(x) = x \text{ mod } 10$ , show the result using hash table using linear probing and separate chaining methods. **(10 Marks)**
6. (a) Define a heap. Describe the steps for removing the node with maximum key in a heap. **(5 Marks)**  
 (b) Show the heap after inserting each of these keys in this order: 8,5,12,4,3,2,9,7,6,10. Show the heap that results from deletion of the heap built in above. **(10 Marks)**
7. Find each of the properties for the graph. **(10 Marks)**



- (i) its size  $n$
- (ii) its vertex set  $V$
- (iii) its edges set  $E$
- (iv) its degree  $d(x)$  of each vertex  $x$
- (v) a path of length 5
- (vi) a cycle of length 4
- (vii) its adjacency matrix
- (viii) its adjacency list
- (ix) DFS tree strategy at vertex 1
- (x) BFS tree strategy at vertex 1

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

**Department of Higher Education**  
**University of Computer Studies, Hinthada**  
**Second Year (B.C.Sc.)**  
**Final Examination**  
**System Analysis and Design (CT-204)**  
**September, 2018**

**Answer All Questions.**

**Time Allowed: 3 Hours**

- I. Choose the answer for the following statements: (20 marks)
- (1) The process of developing and maintaining an information system.  
(A) Agile methodologies (B) System  
(C) System analysis and design (D) Information system analysis and design
  - (2) The overall goal or function of a system.  
(A) Purpose (B) Boundary (C) Constraint (D) Interface
  - (3) Software tools that provide automated support for some portion of the system development process.  
(A) Agile methodologies (B) Computer-aided software engineering (CASE)  
(C) Joint application design (D) Rapid application development
  - (4) The shortest time in which a project can be completed.  
(A) Critical path (B) Slack time (C) Work breakdown structure (D) Resources
  - (5) The first phase of the project management process, in which activities are performed to assess the size, scope, and complexity of the project and to establish procedures to support later project activities.  
(A) Project planning (B) Project initiation (C) Project execution (D) Project closedown
  - (6) The process of dividing the project into manageable tasks and logically ordering them to ensure a smooth evolution between tasks.  
(A) Critical path scheduling (B) Program evaluation review technique  
(C) Work breakdown structure (D) Feasibility study
  - (7) The process of evaluating how key stakeholders within the organization view the proposed system.  
(A) Operational feasibility (B) Economic feasibility  
(C) Political feasibility (D) Schedule feasibility
  - (8) A cost resulting from the ongoing evolution and use of the system.  
(A) Tangible cost (B) Intangible cost (C) One-time cost (D) Recurring cost
  - (9) The way a system actually work.  
(A) Formal system (B) Informal system (C) Key business (D) Disruptive technology
  - (10) Questions in interviewed and on questionnaires that have no prespecified answers.  
(A) Open-ended questions (B) Close-ended questions  
(C) Agenda questions (D) Schedule questions
  - (11) A graphic that illustrates the movement of data between external entities and the processes and data stores within a system.  
(A) Data-flow diagram (B) Decision table (C) Conceptual model (D) None of these

- (12) That part of a decision table that specifies which actions are to be followed for a given set of conditions.  
 (A) Action stubs (B) Condition stubs (C) Rules (D) All of these
- (13) A simultaneous relationship among instances of three entity types.  
 (A) Unary relationship (B) Binary relationship (C) Ternary relationship (D) None of these
- (14) An attribute that uniquely identifies each instance of an entity type.  
 (A) Identifier (B) Multivalued attribute (C) Candidate key (D) Cardinality
- (15) A business document that contains some predefined data and may include some areas where additional data are to be filled in; typically based on one database record.  
 (A) Form (B) Report (C) Dialogue (D) Template-based HTML
- (16) Prototyping is the process of designing and building a scaled-down but working version of a desired system. (True/False)
- (17) Feasibility study is the process of determining whether the information system make sense for the organization from an economic and operational standpoint. (True/False)
- (18) One-time cost is a cost resulting from the ongoing evolution and use of the system. (True/False)
- (19) Closed-ended questions are questions in interviewed and on questionnaires that have no prespecified answers. (True/False)
- (20) To design the system help, the guidelines SOS is simplify, organize and show. (True/False)

II. Answer **ANY FIVE** from the following questions: (20 marks)

- (a) List the phases that included in SDLC. Describe any two of them.
- (b) The activities performed by the project manager during project initiation.
- (c) List the different types of project feasibility factors. Describe any two of them.
- (d) Characteristics for an analyst who are involved in requirement determination.
- (e) To design forms and reports, which questions are, needed to be answered?
- (f) Nine characteristics of a system.
- (g) What are the guidelines for effective interviewing.

III. (a) A project has been defined to contain the following list of activities along with their required times for completion. Draw a **Network diagram** for the activities, **calculate the earliest expected completion time and show the critical path.** (10 marks)

Activity	Time (Weeks)	Immediate Predecessors
A	3	-
B	4	A
C	3	B
D	4	B
E	5	C,D
F	5	E
G	6	E
H	4	F,G



III. (b) For the following figure, prepare the economic feasibility analysis using the discount rate of 10 percent, what are the **overall NPV and ROI**? When will **break even occur**? (10 marks)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Net economic benefits	\$0	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
One-time costs	\$80,000					
Recurring costs	\$0	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000

IV. (a) Perfect Pizza wants to install a system to record orders for pizza and chicken wings. When regular customers call Perfect Pizza on the phone, their phone number goes automatically into the Pizza system. The phone number invokes the name, address, and last order date comes automatically up on the screen. Once the order is taken, the total, including tax and delivery, is calculated. Then the order is given to the cook. A receipt is printed. Occasionally, special offer (coupons) is printed so the customer can get a discount. Drivers who make deliveries give customers a copy of receipt and coupon (if any). Weekly totals are kept for comparison with the last year's performance. Draw a **context diagram** for the Perfect Pizza. (10 marks)

IV.(b) Construct a **decision table** for a marking company to decide how to treat clients according to three characteristics: Gender, City Dweller, and age group: A(under 30),B(between 30 and 60),C(over 60). The company has four products (W,X,Y,Z) to test market. Product W will appeal to female city dwellers. Product X will appeal to female city dwellers. Product X will appeal to young females. Product Y will appeal to Male middle aged shoppers who do not live in cities. Product Z will appeal to all but older females. (10 marks)

V. (a) A university wants to design a database with the following entities: A library has many books and many readers. One reader can borrow many books, one book can be borrowed by many readers at different time. If a book is lent to a reader, the lending date and return date must also be recorded. Attributes about book and readers are given below:

Book: book number, book name, author, price, publishing date, status;

Reader: card number, reader name, gender, address, phone number;

Draw an **E-R diagram** about book and reader, if necessary; add associative entity to represent the relationship between book and reader. (10 marks)

V. (b) The university Student registration system is ready to move into the system design phase which involves designing the system's forms. Reports and database. Using the design guidelines, **design the student registration list form** which shows list of students that have been registered in a specified year. The form should include the student's detail information; register information and appropriate information. (10 marks)

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

**Department of Higher Education**  
**University of Computer Studies, Hinthada**  
**Second Year (B.C.Tech.)**  
**Final Examination**  
**Digital System Design I (CT-205)**  
**October, 2018**

**Time Allowed: 3 Hours**

**Answer All Questions.**

**(20 Marks)**

1. Choose the correct answer.

- (i). A PAL is a logic device which is
- (a) a one-time programmable
  - (b) an erasable programmable
  - (c) electronically erasable and programmable
  - (d) both (a) and (b)
- (ii). A typical macrocell consists of
- (a) gates, multiplexers, a flip-flop
  - (b) gates and a shift register
  - (c) a Gray code counter
  - (d) a fixed logic array
- (iii). A 16-bit word consists of
- (a) 3 bytes
  - (b) 4 nibbles
  - (c) 4 bytes
  - (d) 3 bytes and 1 nibble
- (iv). The storage element of a DRAM is a
- (a) resistor
  - (b) transistor
  - (c) capacitor
  - (d) Diode
- (v). A DAC is a
- (a) digital-to-analog computer
  - (b) digital analysis calculator
  - (c) data accumulation converter
  - (d) digital-to-analog converter
- (vi). The quantization process
- (a) converts the sample-and-hold output to binary code
  - (b) converts a sample impulse to a level
  - (c) converts a sequence of binary codes to a reconstructed analog signal
  - (d) filters out unwanted frequencies before sampling takes place
- (vii). Three methods of modulating a digital signal with analog data are
- (a) PAM, PWM, PPM
  - (b) PAM, ASK, PPM
  - (c) FSK, QAM, PAM
  - (d) QAM, PAM, PWM
- (viii). The modes of light propagation in optical fibers are
- (a) simplex and duplex
  - (b) multimode and single-mode
  - (c) synchronous and asynchronous
  - (d) scatter and direct
- (ix). A system bus is composed of
- (a) address bus
  - (b) data bus
  - (c) system bus
  - (d) answers (a), (b), and (c)
- (x). The role of the CPU is to
- (a) control the system hardware
  - (b) provide hardware support the operating system
  - (c) SP
  - (d) None of these

(10 Marks)

2. Define the following questions.

- (a) What is the difference between a PAL and GAL?
- (b) Describe the refresh operation in a DARM.
- (c) What is the fastest method of analog-to-digital conversion?
- (d) List the types of transmission media.
- (e) How does content-addressable memory differ from conventional memory?

(15 Marks)

3. Answer Any Three of the followings:

- (a) Show how the PAL-type array in Figure- 3(a) should be programmed to implement each of the following SOP expressions. Use an X to indicate a connected link.

$$Y = A\bar{B}C + \bar{A}\bar{B}C + \bar{A}BC$$

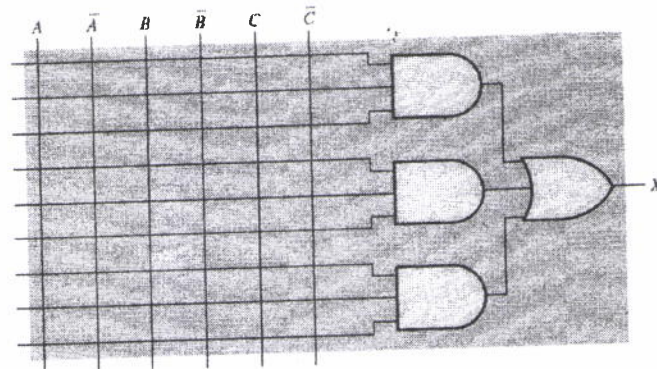


Figure-3(a)

- (b) What is a hit and a miss?
- (c) List the sequence of events for inherent addressing mode.
- (d) Describe the basic operation of a flash memory cell.

4.(a) Draw a simplified diagram of a macrocell in a typical CPLD.

(10 Marks)

- (b) List five properties of a cloud storage system and briefly discuss each.

(10Marks)

- (c) Explain how SRAMs and DRAMs differ.

(5 Marks)

5.(a) Determine the output of the DAC in Figure-5(a) if the waveforms representing a sequence of 4-bit numbers in Figure-5(b) are applied to the inputs. Input  $D_0$  is the least significant bit (LSB).

(10 Marks)

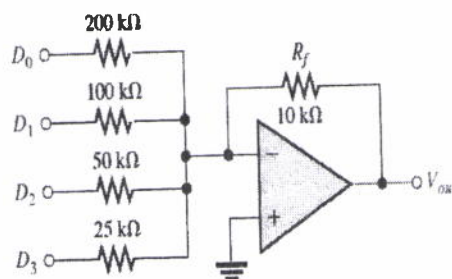


Figure-5(a)

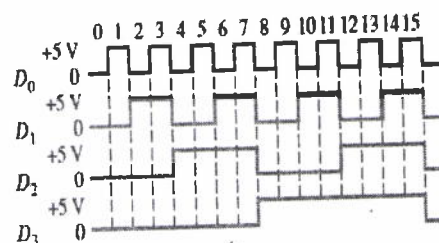


Figure-5(b)

- (b) List three major classes of modulation techniques and explain Amplitude-Shift Keying modulation.

(10 Marks)

- (c) Discuss about Direct Memory Access (DMA).

(10 Marks)

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

**Department of Higher Education**  
**University of Computer Studies, Hinthada**  
**Second Year (B.C.Tech.)**  
**Final Examination**  
**Electrical Circuits I (CT-206)**  
**October, 2018**

**Answer All Questions.**

**Time Allowed: 3 Hours**

- 1.(a) If it is assumed that all the sources in the circuit of Figure-1 have been connected and operating for a very long time, use the superposition principle to find  $v_C(t)$  and  $v_L(t)$ . **(10 marks)**

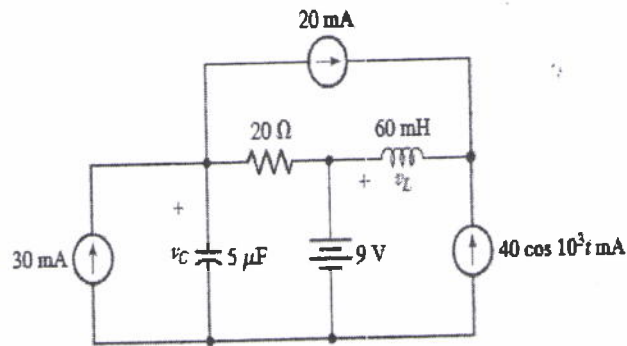


Figure-1

- (b) A 100mH inductor has voltage  $v_L = 2e^{-3t}$  V across its terminals. Determine the resulting inductor current if  $i_L(-0.5) = 1$ A. **(10 Marks)**
- 2.(a) In the circuit of Figure-2(a), both sources operate at  $\omega = 1$  rad/s. If  $I_C = 2\angle 28^\circ$  A and  $I_L = 3\angle 53^\circ$  A, calculate (a)  $I_s$ ; (b)  $V_s$ ; (c)  $i_{R1}(t)$ . **(10 Marks)**
- (b) Determine the equivalent impedance of the network shown in Figure-2(b), given an operating frequency of 5 rad/s. **(10 Marks)**

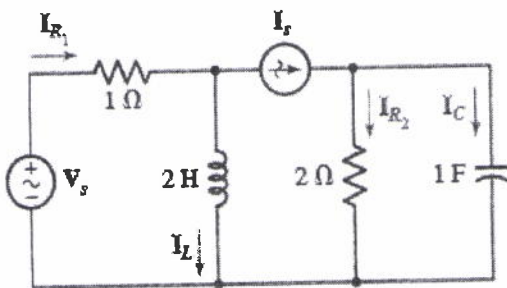


Figure-2(a)

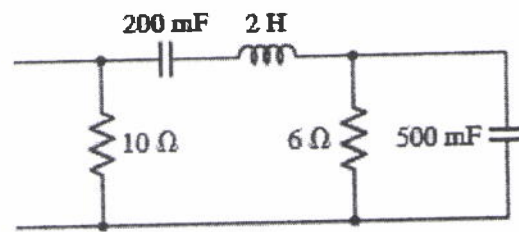


Figure-2(b)

- 3.(a) A current source of  $12 \cos 2000t$  A, a  $200\Omega$  resistor, and a  $0.2$ H inductor are in parallel. Assume steady-state conditions exist. At  $t=1$  ms, find the power being absorbed by the (a) resistor; (b) inductor; (c) sinusoidal source. **(10 marks)**
- (b) Calculate values for the average power delivered to each of the two loads shown in Figure-3(b), the apparent power supplied by the source, and the power factor of the combined loads. **(10 marks)**



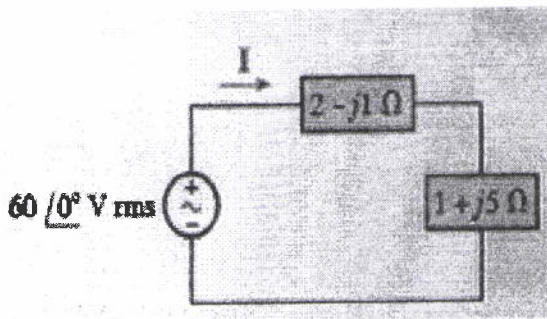


Figure-3(b)

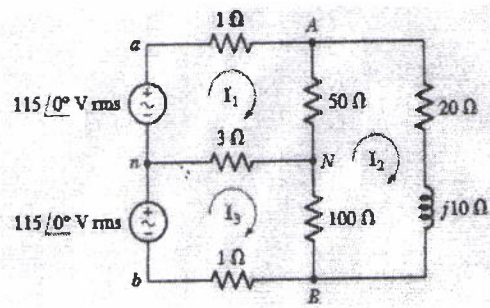


Figure-4(a)

- 4.(a) Determine the power delivered to each of the three loads in Figure-4(a). **(10 marks)**  
 (b) Determine the amplitude of the line current in a three-phase system with a line voltage of 300V that supplies 2000W to a  $\Delta$ -connected load at a lagging power factor, PF of 0.9; then find the phase impedance. **(10 Marks)**
- 5.(a) For the circuit shown in Figure-5(a), find the ratio of the output voltage across the 400 $\Omega$  resistor to the source voltage, expressed using phasor notation. **(10 Marks)**

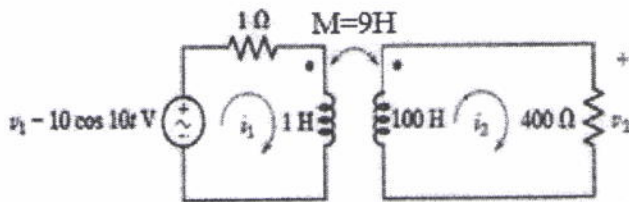


Figure-5(a)

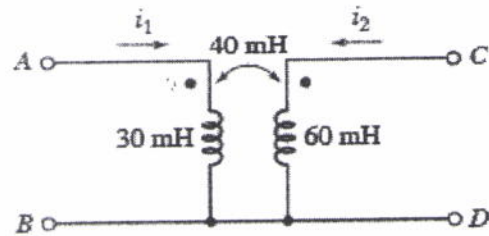


Figure-5(b)

- (b) Find the equivalent  $\Pi$  network of the transformer in Figure-5(b), assuming zero initial currents. **(10 Marks)**

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