

INSTITUTE OF INFORMATION TECHNOLOGY

Course: Data Structure Lab

Time: 1 Hour

Total Marks: 30

- 1) Write a C++ program to merge two sorted array into one sorted array.
Sample input: Array1 = 2, 4, 5, 8, 9
 Array2 = 3, 6, 7, 10, 12
 Output: 2, 3, 4, 5, 6, 7, 8, 9, 10, 12
- 2) Write a C++ program to implement Count Sort.
- 3) Write a C++ program to implement Stack using linked list. a) Insert into Stack b) Delete an item from Stack c) Traverse the Stack.
- 4) Write a C++ program to implement Queue using linked list. a) Insert into Queue b) Delete an item from Queue c) Traverse the Queue.

Answer any **Five (05)** from the following questions. Figures at the right indicate the marks.

1. a) What do you mean by the 'complexity of an algorithm'? Write some prominent features an algorithm should have. 3
- b) What are the various types of data structures widely used? List the name of operations that can be performed on a particular data structure? 3
- c) What is data type? Mention the size and range of various integer data types. What are general rules for using variable name in C programming? 4
- d) Write two considerations on which the choice of a particular data structure depends. 2

2. a) Describe the worst case running time of the following pseudocode functions in Big-Oh notation in terms of the variable n 3


```
void silly(int n) {
    if (n <= 0) return;
    System.out.println("n = " + n);
    silly(n/2);
}
```
- b) Write down algorithm to delete an item from a Singly Linked List. 4
- c) What is difference between Singly Linked List and Doubly Linked List data structure? 2
- d) What is the maximum number of comparisons that can take place when a bubble sort is implemented? Assume there are n elements in the array? 3

3. a) Suppose you implement a queue as a linked list. Write the code for the insert and delete operations. 4


```
struct Node{
    int data;
    struct Node *next;
}*front =NULL; *rear= NULL;
void insert (int value) {.....}
void delete ( ) {.....}
```
- b) Consider the following infix expression Q: 5

$$Q: (4+8)*(6-5) / ((3-2)*(2+2))$$

Translate Q into its equivalent postfix expression P using STACK.
- c) What is overflow and underflow? When do they occur in a linked list? 3

4. a) Write down the quick sort algorithm to sort some positive integers. 4
- b) Suppose S is the following list of 8 integers: 4

$$2 \ 8 \ 7 \ 1 \ 3 \ 5 \ 6 \ 4$$

Apply the PARTITION subroutine of quick sort algorithm to divide the list into two parts.
- c) Show that the running time of QUICKSORT is $\Theta(n^2)$ when the array A contains distinct elements and is sorted in decreasing order. 2
- d) What is the difference between queue and priority queue. 2

5. a) What are the different ways of representing a binary tree in the memory of a computer? Illustrate any one of them. 3

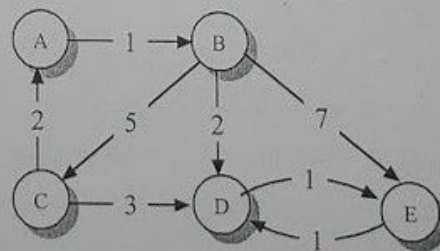
- b) What is a threaded tree? Convert the binary tree shown in figure-2 into a two-way in-order threaded tree. 3
- c) What are the criteria for building a heap? Build a heap H from the following list of numbers: 3
- 18, 25, 50, 37, 80, 55, 44, 66
- d) What is Huffman coding? Suppose the frequency of occurrence of some characters for an English text is shown in the table below. Construct a Huffman Coding tree. And then determine Huffman code for each of the characters. 3

Letter	Frequency
D	100
H	53
K	133
P	60
T	44
I	8

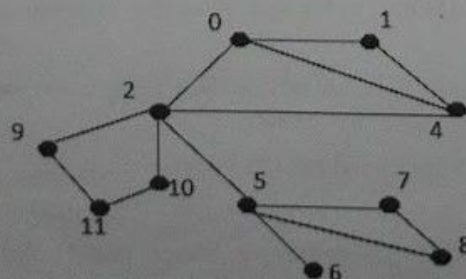
6. a) A binary tree T has 9 nodes. The *inorder* and *preorder* traversals of T are as follows: 4
- Inorder: E A C K F H D B G
- Preorder: F A E K C D H G B
- Draw the tree T.
- b) Make a Binary Search Tree (BST) for the following sequence of numbers. 11, 6, 8, 19, 4, 10, 5, 17, 43, 49, 31. Traverse the Binary Search Tree (BST) created in *Preorder*, *Inorder*. 5
- c) Write down the algorithm to insert an item in a *binary search tree*. 3
7. a) The following values are to be stored in a hash table 4
- 25, 42, 96, 101, 102, 162, 197

Describe how the values are hashed by using remainder method of hashing with a table size of 7. Use quadratic probing as the method of collision resolution.

- b) Draw the node list and adjacency matrix for the following digraph G. 2



- c) Draw the AVL tree that results from inserting the keys: 3, 9, 2, 7, 4, 5, 8 in that order into an initially empty AVL tree. 3
- d) Show the result of running depth first search (DFS) on the undirected graph given below using vertex 0 as source. 3



ANSWER ANY FIVE (5) QUESTIONS

1. a) Why C++ is called an object-oriented programming (OOP) language?
b) What is Polymorphism? How is it supported by C++?
c) Write the output of the following program and explain.

3

4

2

```
#include <iostream>
using namespace std;

void swapThemByVal(int num1, int num2)
{
    int temp = num1;
    num1 = num2;
    num2 = temp;
}

void swapThemByRef(int& num1, int& num2)
{
    int temp = num1;
    num1 = num2;
    num2 = temp;
}
```

```
int main()
{
    int i = 10, j = 20;
    swapThemByVal(i, j);
    cout << i << " " << j << endl;
    swapThemByRef(i, j);
    cout << i << " " << j << endl;
    return 0;
}
```

- d) How does method overloading differ from method overriding?
e) Write the output of the following program and explain.

2

1

```
#include <iostream>
using namespace std;

int main()
{
    float a[] = {2.0, 3.5, 8.9, 5.5};
    float* p = a;
    cout << p << endl;
    cout << *p << endl;
    ++p;
    ++p;
    cout << p << endl;
    cout << *p << endl;
    return 0;
}
```

2. a) Discuss about the output for the following two programs

2

```
int main()
{
    char str1[100];
    cout << "Enter string" << endl;
    cin >> str1;
    cout << "Entered string " << str1 << endl;

    return 0;
}
```

```
int main()
{
    char str1[100];
    cout << "Enter string" << endl;
    cin.get(str1, 100);
    cout << "Entered string " << str1 << endl;

    return 0;
}
```

- b) Write a program in C++ to count the number of words in string.
c) Give the object oriented terminology for each of the following object oriented features and supply an example of code that illustrates the feature:
i) A blueprint for an object which defines all the data items contained in the object and the operations that are permitted for the data;
ii) A representation of something within the domain that the program models which contains values of data and which implements operations on that data;
iii) An operation which will manipulate the data contained in an object;
d) For the following Class **Rectangle**, how the members of object **rect** can be accessed? Write the rest of the code to calculate area.

2

3

3

```
class Rectangle {
    int width, height;
public:
    void set_values (int, int);
    int area (void);
} rect;
```

- e) Mention the things to remember while using Public, Protected and Private Inheritance

2

3. a) What is the purpose of the scope resolution operator? 4
- b) Explain Parameterized Constructors, Overloading constructors and copy constructor with examples. 4
- c) "When an object is created, a constructor is called automatically to manage its birth. Similarly, when an object comes to the end of its life, another special member function is called automatically to manage its death". Now explain about the function with example program. 4
- d) A friend function has access to all private and protected members of the class for which it is a friend. Write Syntax of such friend function. 1

4. a) How can you use a base class function using an object/instance of derived class? Explain with example. 4

- b) Consider the inheritance relation in fig. 2. Implement it in C++. 5

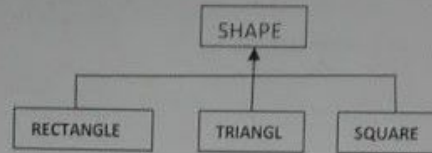


Fig. 2

- c) How can derived class override a base class function? 3

5. a) Compare the inheritance for C++ with Java. 4
- b) What is the difference between protected and private members? 3
- c) What is an abstract base class and concrete derived class? 3
- d) How does polymorphism promote extensibility? 2

6. a) Why multiple inheritance is not supported in java? Explain with example 3
- b) Can we override static method? Explain in case of java main method. 2
- c) Explain in detail java.util.Scanner and System.in with example. Also show How to put a Scanner input into an array 2
- d) What is exception handling? Advantage of Exception Handling 3
- e) Explain JDBC. 2

7. a) Write the output of the following code: 2

```

class Joinmethod extends Thread{
    public void run(){
        for(int i=1;i<=5;i++){
            try{
                Thread.sleep(500);
            }catch(Exception e){System.out.println(e);}
            System.out.println(i);
        }
    }
    public static void main(String args[]){
        Joinmethod t1=new Joinmethod();
        Joinmethod t2=new Joinmethod();
        Joinmethod t3=new Joinmethod();
        t1.start();
        try{
            t1.join(1000);
        }catch(Exception e){System.out.println(e);}

        t2.start();
        t3.start();
    }
}
  
```

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

- b) Can we start a thread twice? Explain with example 3
- c) Mention the Problem if we call run() method directly instead start() method? 2
- d) Write a Greeting Client program that connects to a server by using a socket and sends a greeting, and then waits for a response. 5

Course Code: IT-1205
Time: 3 Hours

Course Title: Discrete Mathematics
Full Marks: 60

Answer any **FIVE** Questions
All parts of a particular question must be answered consecutively

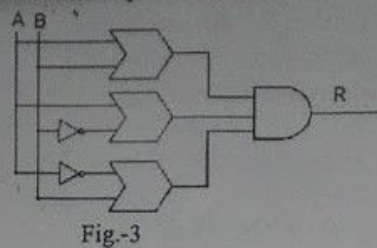
- 1(a) Translate each of the following sentences into propositional expression: 6
- "Neither the fox nor the lynx can catch the hare if the hare is alert and quick."
 - "You can either (stay at the hotel or watch TV) or (you can go to the museum and spend some time there)".
- (b) Suppose a conditional statement **"If we are on vacation we go fishing."** Is given in English. 4
- translate the sentence into a logical expression
 - write the negation of the logical expression and translate the negation into English
 - write the converse of the logical expression and translate the converse into English
 - write the inverse of the logical expression and translate the inverse into English
- (c) Construct a truth table for the following compound proposition 2
- $$(p \rightarrow q) \rightarrow (q \rightarrow p)$$
- 2(a) An advertising agency finds that, of its 170 clients, 115 use Television, 110 use Radio and 130 use Magazines. Also 85 use Television and Magazines, 75 use Television and Radio, 95 use Radio and Magazines, 70 use all the three. Draw Venn diagram to represent these data. Find 3
- How many use only Radio?
 - How many use only Television?
 - How many use Television and Magazine but not radio?
- (b) Let $A = \{0, 1, 2, 3\}$ and a relation R on A be given by $R = \{(0, 0), (0, 1), (0, 3), (1, 0), (1, 1), (2, 2), (3, 0), (3, 3)\}$. Is R reflexive? Symmetric? Transitive? Draw the diagram. 3
- (c) Given that $A = \{a_1, a_2, a_3\}$ and $B = \{b_1, b_2, b_3, b_4, b_5\}$. 6
- Which ordered pairs are in the relation R represented by the matrix (Fig-1)?
- $$M_R = \begin{pmatrix} 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 \end{pmatrix}$$

Fig-1

Fig-2
- Let R be the relation on $\{1, 2, 3, 4, 5\}$ represented by the graph (Fig-2). What is $R \circ R$?
 - If the relation R on A be defined by $R = \{(a, b) \mid a \leq b\}$. Represent R by a matrix.

$$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$$
- 3(a) Suppose that a new company has five employees: Tania, Abraham, Sujit, Chaiti and Maruf. 4
- Each employee will assume one of six responsibilities: planning, publicity, sales marketing, and development and industry relations. Each employee is capable of doing one or more of these jobs: Zamora could do planning sales, marketing or industry relations; Abraham could do planning or development; Smith could do publicity, sales or industry relations; Chou could do planning, sales or industry relations; and Mac could do planning, publicity, sales or industry relations.
- Model the capability of these employees using a bipartite graph.
 - Find an assignment of responsibilities such that each employee is assigned a responsibility.
- (b) 4
- What is the ordered rooted tree that represents the expression $((x+y) \uparrow 2) + (x-4)/3$?
 - What is the prefix form?
- (c) How many reflexive relations are there on a set of n elements? 4

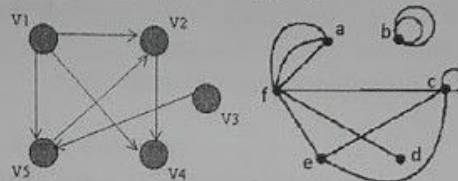
- 4(a) Write the equivalent Boolean expression R for the following circuit diagram (Fig-3).



		YZ			
		00	01	11	10
WX	00	1	0	0	1
	01	0	0	0	0
	11	0	0	0	0
	10	1	0	0	1

Fig.-4

- (b) Define Minterm, Maxterm, Sum of Product (SOP) and Product of Sum (POS) with example. 3
- (c) Minimize the following Boolean expression using K-map:
 $F(A,B,C) = A'BC + A'BC' + AB'C' + AB'C$ 3
- (d) Write the simplified Boolean expression of Fig-4 using K-map. 3
- 5(a) Define Dense and Sparse graphs with example. How many ways are to represent Graphs in Computer Memory? Cite an example of a graph with block diagram to represent into memory. 4
- (b) Find the adjacency matrix of each of the following graph G. 3



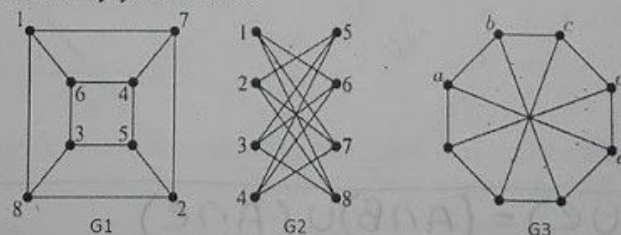
- (c) Draw the graphs corresponding to each adjacency matrix. 3

$$G1 = \begin{bmatrix} 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 1 & 1 \\ 1 & 1 & 1 & 0 & 1 \\ 0 & 1 & 1 & 1 & 0 \end{bmatrix} \quad G2 = \begin{bmatrix} 1 & 3 & 0 & 0 \\ 3 & 0 & 1 & 1 \\ 0 & 1 & 2 & 2 \\ 0 & 1 & 2 & 0 \end{bmatrix}$$

(i) (ii)

- (d) Assume a graph with five vertices, then how many edges contain in the graph and what is the name of that graph and how is it denoted? 2

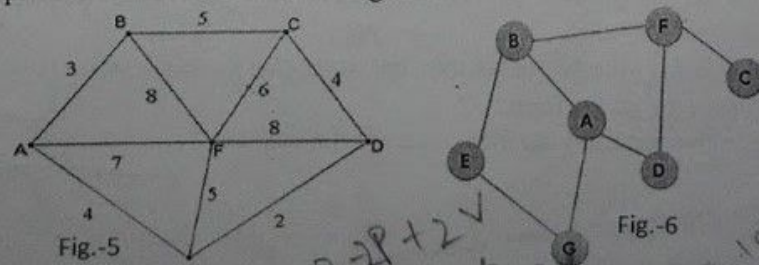
- 6(a) With what conditions two graphs are said to be isomorphic? Determine which pairs of graphs below are isomorphic. Justify your answer 5



- (b) For any graph $G = (V_G, E_G)$, show that $2|E_G| = \sum_{v \in V(G)} \deg(v)$. 3

- (c) Show that if a tree has two vertices of degree 3, then it must have at least 4 vertices of degree 1. 4

- 7(a) Write Depth First Search (DFS), Breadth First Search (BFS) and Kruskal's Algorithms. 3
- (b) i. Find the shortest path by applying Kruskal's Algorithm (Fig.-5). 5
- ii. Find the output sequences by applying DFS and BFS (Fig.-6).
- (c) Write the C implementation of DFS or BFS algorithm. 4



Handwritten notes and calculations at the bottom of the page, including '2N', '2N+2', and '7, 2-2P+2V'.

Jahangirnagar University
Institute of Information Technology
1st Year 2nd Semester Final Examination 2017
Course IT-1207 (Economics)
Full Mark: 60 Time: 3 hours
Answer any Five of the following questions

1.a) What are the fundamental economic problems of a society? Why such problems arise? How does the market economy solve these problems? 8

b) 'Scarcity implies choice; choice implies opportunity cost'. Explain. 4

2. A university produces two commodities: research and teaching. The resources the university uses include faculty and staff, libraries, classrooms, labs and so on. The following schedule indicates some points on the university's PPF: 12

	A	B	C	D	E	F	G
Research	900	750	600	450	300	150	0
Teaching	0	20	45	75	110	150	200

- i) Define PPF? Graph the university's PPF and explain efficient, inefficient and impossible points.
- ii) Suppose the university is at point B but would like to alter production to point C. What would be the per-teaching unit opportunity cost of producing the extra teaching units?
- iii) What will happen to the PPF if the main laboratory burns down? Graph the new PPF.
- iv) What will happen to the PPF if all of the campus resources are cut in half? Graph the new PPF.

3.a) Why does the supply curve upward sloping? If (i) technological innovation occurs and (ii) raw materials prices increase in the economy, what will happen in the supply curve? Explain with relevant figures. 6

b) Given a demand equation is $Q_d = 40 - 4P$; where Q_d is the quantity demand and P is the price and a supply equation $Q_s = 20 + P$; where Q_s is the quantity supplied and P is the price. Draw the demand and supply curve correctly and show the market equilibrium point and calculate the equilibrium price and quantity. 6

4. a) Explain with necessary diagram and schedule how equilibrium is determined in the computer software market. 6

b) Explain with the **diagram** what will happen to the market equilibrium of a computer software X if:

- i) price of the substitutes decrease;
- ii) technological innovation takes place.

5.a) What is the law of demand? Examine graphically. What are its exception? 6

b) 'The law of demand remains valid if other things remain unchanged'-Explain these other things? What will happen if other things changes? Examine with the diagram. 6

6. a) What are the goals of macro economics and what are the available instruments to achieve those goals?

Explain with a table.

3

b) Explain the circular flow of GDP.

4

c) Below are some data on two goods produced in the economy.

5

Year	Price of rice(/kg) in TK.	Quantity of rice (kg)	Price of cloth (/yard) in TK.	Quantity of cloth (/yard)
2010	15	200	20	250
2011	25	250	35	400
2012	30	300	40	550

7. a) On Tuesday, price and quantity demanded are Tk. 7 and 120 units, respectively. Ten days later, price and quantity demanded are Tk. 5 and 150 units, respectively. Calculate the price elasticity of demand and interpret the result.

8

b) Distinguish between income and cross elasticity of demand. How the nature of the commodities are determined by theses elasticities.

4

25

$$\frac{150-120}{(130+120)/2} \div \frac{7-5}{(7+5)/2}$$

$$\frac{30}{130} \times \frac{2}{2}$$

$$\frac{150-120}{130+120} \div \frac{3-7}{5}$$

$$\frac{30}{130} \times \frac{2}{2}$$

Time: 3 Hours

Marks: 60

- Answer any five (05) of the following questions.
- All parts of each question must be answered sequentially.

Question 1:

Marks: 3+4+5=12

- What is Accounting? Define the elements of accounting equation with examples.
- Who are the users of accounting data? How does accounting provide relevant data to these users?
- Identify and describe the steps in the accounting process.

Question 2:

Marks: 3+9=12

- What are the basic steps in recording process? Explain those steps.
- Dennis Luljak started his own delivery service, Luljak Deliveries, on June 1, 2014. The following transactions occurred during the month of June.

- June
- Dennis invested \$10,000 cash in the business.
 - Purchased a used van for deliveries for \$12,000. Dennis paid \$2,000 cash and signed a note payable for the remaining balance.
 - Paid \$500 for office rent for the month.
 - Performed \$4,400 of services on account.
 - Withdrew \$200 cash for personal use.
 - Purchased supplies for \$150 on account.
 - Received a cash payment of \$1,250 for services performed on June 5.
 - Purchased gasoline for \$200 on account.
 - Received a cash payment of \$1,300 for services performed.
 - Received a cash payment of \$1,300 for services performed.
 - Paid \$250 for utilities.
 - Paid for the gasoline purchased on account on June 17.
 - Paid \$1,000 for employee salaries.

Instruction: Prepare a tabular analysis of the above transactions.

Question 3:

Marks: 3+9=12

- What is a chart of accounts and why is it important?
- The Classic Theater is owned by Kim Lockerby. All facilities were completed on March 31. At this time, the ledger showed: Cash \$4,000, Land \$10,000, Buildings (concession stand, projection room, ticket booth, and screen) \$8,000, Equipment \$6,000, Accounts Payable \$2,000, Mortgage Payable \$8,000, and Owner's Capital \$18,000. During April, the following events and transactions occurred.

- April
- Paid film rental of \$1,100 on first movie.
 - Ordered two additional films at \$1,000 each.
 - Received \$2,800 cash from admissions.
 - Made \$2,000 payment on mortgage and \$1,000 for accounts payable due.
 - Classic Theater contracted with Rhonda Humes to operate the concession stand. Humes is to pay Classic Theater 20% of gross concession receipts, payable monthly, for the rental of the concession stand.
 - Paid advertising expenses \$500.
 - Received one of the films ordered on April 3 and was billed \$1,000. The film will be shown in April.
 - Received \$5,200 cash from admissions.
 - Paid salaries \$2,000.
 - Received statement from Rhonda Humes showing gross concession receipts of \$1,000 and the balance due to The Classic Theater of \$200 ($\$1,000 \times 20\%$) for April. Humes paid one-half of the balance due and will remit the remainder on May 5.
 - Prepaid \$1,200 rental on special film to be run in May.

In addition to the accounts identified above, the chart of accounts shows: Accounts Receivable, Prepaid Rent, Service Revenue, Rent Revenue, Advertising Expense, Salaries & Wages Expense, and Rent Expense.

Instruction: Journalize the April transactions.

Question 4:

Marks: 5+5+2=12

Maria Juarez is a licensed dentist. During the first month of the operation of her business, the following events and transactions occurred.

- July 1 Invested \$40,000 cash.
 1 Hired a secretary-receptionist at a salary of \$600 per week payable monthly.
 2 Paid office rent for the month \$1,000.
 3 Purchased dental supplies on account from Smile Company \$4,000.
 10 Provided dental services and billed insurance companies \$5,100.
 15 Received \$1,000 cash advance from Trudy Borke for an implant.
 20 Received \$2,100 cash for services completed and delivered to John Stanley.
 25 Paid \$1,600 to Smile Company for accounts payable due.
 31 Paid secretary-receptionist for the month \$2,400.

Maria uses the following chart of accounts: Cash, Accounts Receivable, Supplies, Accounts Payable, Unearned Revenue, Maria's Capital, Service Revenue, Salaries Expense, and Rent Expense.

Instructions

- (a) Journalize the transactions.
 (b) Post to the ledger accounts.
 (c) Prepare a trial balance on July 31, 2016.

Question 5:

Marks: 2+7+3=12

- a) What is trial balance? What are the limitations of a trial balance?
 b) Drew Carey Company has the following balances in selected accounts on December 31, 2010.

Accounts Receivable	\$ -0-
Accumulated Depreciation—Equipment	-0-
Equipment	7,000
Interest Payable	-0-
Notes Payable	10,000
Prepaid Insurance	2,100
Salaries Payable	-0-
Supplies	2,450
Unearned Consulting Revenue	40,000

All the accounts have normal balances. The information below has been gathered at December 31, 2010:

1. Drew Carey Company borrowed \$10,000 by signing a 12%, one-year note on September 1, 2010.
2. A count of supplies on December 31, 2010, indicates that supplies of \$800 are on hand.
3. Depreciation on the equipment for 2010 is \$1,000.
4. Drew Carey Company paid \$2,100 for 12 months of insurance coverage on June 1, 2010.
5. On December 1, 2010, Drew Carey collected \$40,000 for consulting services to be performed from December 1, 2010, through March 31, 2011.
6. Drew Carey performed consulting services for a client in December 2010. The client will be billed \$4,200.
7. Drew Carey Company pays its employees total salaries of \$9,000 every Monday for the preceding 5-day week (Monday through Friday). On Monday, December 29, employees were paid for the week ending December 26. All employees worked the last 3 days of 2010.

Instructions: Prepare adjusting entries for the seven items described above.

- c) At the beginning of the year, Hernandez Company had total assets of \$800,000 and total liabilities of \$500,000. Answer the following questions (Every situation is independent):
- (a) If total assets increased \$150,000 during the year and total liabilities decreased \$80,000, what is the amount of owner's equity at the end of the year?
- (b) During the year, total liabilities increased \$100,000 and owner's equity decreased \$70,000. What is the amount of total assets at the end of the year?
- (c) If total assets decreased \$80,000 and owner's equity increased \$120,000 during the year, what is the amount of total liabilities at the end of the year?

Question 6: Marks: 6+6=12
a) Andy Wright, D.D.S., opened a dental practice on January 1, 2010. During the first month of operations the following transactions occurred.

- i) Performed services for patients who had dental plan insurance. At January 31, \$875 of such services was earned but not yet recorded.
- ii) Utility expenses incurred but not paid prior to January 31 totaled \$520.
- iii) Purchased dental equipment on January 1 for \$80,000, paying \$20,000 in cash and signing a \$60,000, 3-year note payable. The equipment depreciates \$400 per month. Interest is \$500 per month.
- iv) Purchased a one-year malpractice insurance policy on January 1 for \$12,000.
- v) Purchased \$1,600 of dental supplies. On January 31, determined that \$400 of supplies were on hand.

Instructions: Prepare the adjusting entries on January 31.

Account titles are: Accumulated Depreciation-Dental Equipment, Depreciation Expense, Service Revenue, Accounts Receivable, Insurance Expense, Interest Expense, Interest Payable, Prepaid Insurance, Supplies, Supplies Expense, Utilities Expense, and Utilities Payable.

- b) Emil Skoda Company had the following adjusted trial balance.

EMIL SKODA COMPANY
Adjusted Trial Balance
for the Month Ended June 30, 2017

Accounts titles	Debits	Credits
Cash	\$3,712	
Accounts Receivable	3,904	
Supplies	480	
Accounts Payable		\$1,792
Unearned Revenue		160
Emil Skoda, Capital		5,760
Emil Skoda, Drawing	300	
Service Revenue		4,064
Salaries Expense	1,344	
Miscellaneous Expense	256	
Supplies Expense	2,228	
Salaries Payable		448
	<u>\$12,224</u>	<u>\$12,224</u>

Instructions

- (i) Prepare closing entries at June 30, 2017.
- (ii) Prepare a post-closing trial balance.

Question 7:

Marks: 3+9=12

- a) Define with examples: i) Opportunity Cost ii) Variable Cost iii) Fixed Cost

- b) The Jame Electronics Ltd. manufactures electronic products. A summary of its activities for the month of January 2002 is as follows:

Stock on 1.1.02:

Direct Material	1,200.00
Work-in-progress	3,100.00
Finished Goods	6,700.00
Direct Material purchased	20,800.00
Carriage on purchase	600.00
Direct wages	15,300.00
Non-productive wages	300.00
Direct Expenses	700.00
Rent, rates and insurance (80% factory)	12,000.00
Depreciation of:	
Factory equipment	2,000.00

Office building	1,000.00
Sales equipment	500.00
Building rent (factory)	1,000.00
Other overhead expense (50% Factory related)	6000.00
Advertising expense	1,800.00
Selling expense	1,000.00
Office insurance	2,000.00
Sales department salaries	500.00
Stock on 31.01.02	
Direct Material	1,500.00
Work-in-progress	4,000.00
Finished Goods	3,800.00
Sales	100,000.00

Requirement:

- Prepare a cost of goods sold statement for the month ended January 31, 2002.
- Assume that the company produced the equivalent of 10000 units of during the year. What was the average cost per unit of direct materials? What was the average cost per unit of building rent?
- Assume that the company expects to produce 15000 units of product during the coming year. What average cost per unit and what total cost would you expect the company to incur for direct materials? For building rent?
- Prepare an income statement for the month ended January 31, 2002.