Autumn, 2019

Mid- Semester Assessment

Department: CSE

Paper Name: Biology for Engineers	Paper Code: 1151131
Paper Component: Theory	Semester: 3rd
Time Allotted: 1 hour	Maximum Marks: 30

A) Answer any five questions: [5 X 2 = 1(

1) What are the macromolecules present in biological systems?
2) Which organelle is known as power house of cell and why?
3) What are the major components of cell membrane?
4) What are the functions of SSB protein and DNA Pol – I enzyme in DNA replication?
5) What are the components of RNA polymerase core enzyme?
6) What are the nitrogenous bases present in DNA / RNA?
7) Explain Chargaff's rule.
8) How many types of RNA molecules are synthesized in transcription? What are they?

B) Answer any five questions: [5 X 4 = 20]

1) Schematically state the central dogma of molecular biology.
2) State the postulates of DNA structure.
3) What are promoter regions?
4) Why sigma factor is important for transcription to be initiated?
5) What are Okazaki fragments in DNA replication?
6) What are the differences between DNA and RNA?
7) What are the modes of transcription termination – describe in brief.
8) What are post transcriptional modifications?
9) Sequentially write down the enzymes involved in DNA replication.

SISTER NIVEDITA UNIVERSITY

SWITCHING CIRCUIT THEORY AND LOGIC DESIGN

MID SEM

BTECH CSE 3RD SEM.(SET A)

TOTAL MARKS:30   **TOTAL TIME:1 HOUR**

1. Perform binary division of 101101 by 110   4

2. Convert binary 111111110010 to hexadecimal   3

3. Convert gray to binary 1110   3

4. Explain SOP and POS with a suitable example(truth table and expression).   6

5. $(0.345)_{10}=(?)_8$ 3

6. Explain full adder using proper truth table, k-map and logical diagram.   4

7. $F(A, B, C)=\pi M(2,3,5)$ Convert it to standard SOP.   7

Course Name: Engineering Mathematics –III   (Set 2)

Course Code: 1191131

| Time Allotted: 60 Minutes | Maximum Marks: 30 |

A. Answer any five of the following (MCQ type):   5x1 = 5

1.i) A single-vertex graph is

  a) 1-chromatic   b) 2-chromatic   c) 0-chromatic   d) 3-chromatic

ii)   In a graph G, $\chi(K_n) =$

  a) n-1   b) n   c) 0   d) n+1

iii) Kuratowski's First Graph is a graph with 5 vertices if it is

  a) connected   b) plannar   c) complete   d) tree

iv) The sum of degrees of all vertices of a graph is

    a) even   b) odd   c) odd or even   d) none of these

v) The following two graphs are

    a) Isomorphic   b) homeomorphic   c) none of these

vi) The chromatic number of a complete graph with 5 vertices is

  a) 8   b) 7   c) 6   d) 5

B. Answer any five questions from the following: 5x5 = 25

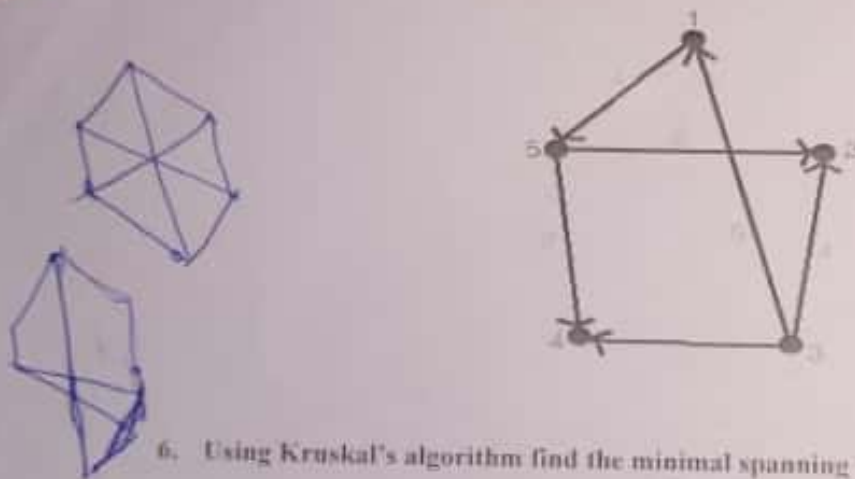 2. Represent each of the expressions in a binary tree
     a) $(A+B)*(C-D)$

b) $[(A-B) \uparrow 2]/(A+B)$

3. Remove an edge of Kuratowski's First Graph and show that it becomes planar.

4. Define homeomorphic Graphs. Show that the following graphs are homeomorphic.

5. Obtain the incidence matrix of the following graph

6. Using Kruskal's algorithm find the minimal spanning tree for the graph of the following

7. Prove that the binary tree with n vertices, the number of pendent vertices is $\dfrac{n+1}{2}$

The figures in the margin indicate full marks.

SET – II

1. Predict the output of the following code: Justify your answer.   3

```
#include<iostream>
using namespace std;
class A {
        public:
        A(){cout<<endl<<"default constructor called";}
        A(const A& o){cout<<endl<<"copy constructor called"; }
        A f(A& o){return o;}
};
int main(){    A o1;   A o2(o1);       o1.f(o2); }
```

2. Predict the output of the following code: Justify your answer.   3

```
#include <iostream>
using namespace std;
class A {
public:
        A(){    cout<<"A's constructor called"; }
};
class B {        static A a;
public:
        B(){    cout<<"B's constructor called"; }
        static A get(){   return a;         }
};
A B::a;
int main(int argc, char const *argv[])
{        B b;    A a1 = b.get(); A a2 = b.get(); A a3 = b.get(); }
```

3. Define a 6-bit non-negative integer, Tiny, that can mix freely with integers in arithmetic operations. Add suitable constructor. Overload arithmetic (+), bitwise (<<, >> not as friend function) and assignment operators. Also overload type casting operator such as int, unsigned int etc.   10

4. Design copy constructors for a class having a dynamic array as member variable. Also, overload '=' operator for the same.   4