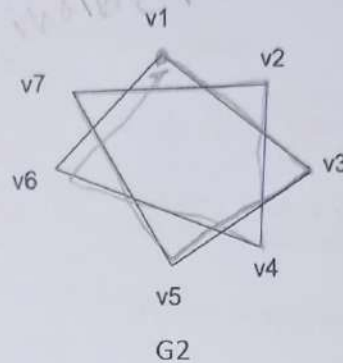
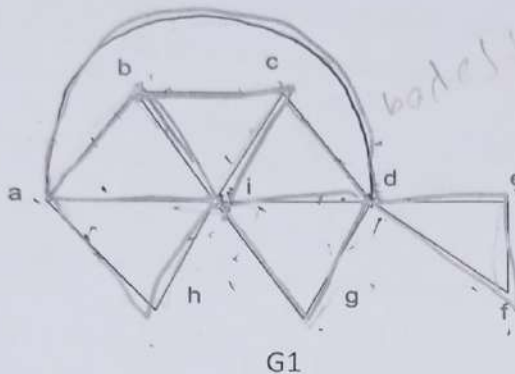
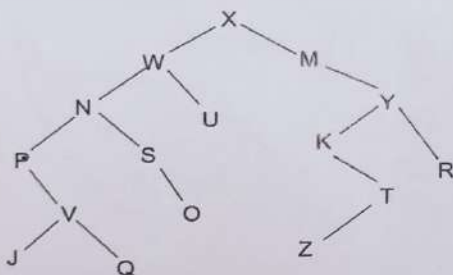


- ✓ 1. Compute number of vertices and edges of the graph $K_{50,100}$. 1.5
- ✓ 2. Is it possible to draw a graph with degree of vertices 1, 1, 3, 3, 2? 1.5
If possible, draw the graph.
- ✓ 3. Is it possible to exist any Euler path or Euler circuit in the graph G1? 2
If possible show the circuit/path.
- ✓ 4. Derive chromatic number of G1 using Welch-Powel algorithm. 2.5
- ✓ 5. Prove that C_7 and graph G2 are isomorphic to each other. 5



6. Suppose that a connected planar simple graph has 20 vertices each of degree 3. 1.5
In this graph, how many regions are there?
- ✓ 7. Mention the two basic features of a tree which differentiate it from other kind 2.5
of graphs. Traverse the following tree in in order way.



- ✓ 8. Write down the contrapositive of the proposition: 1
The home team wins whenever it is raining. $\neg q \rightarrow \neg p$
- ✓ 9. Show the truth table of the proposition $(p \vee q) \wedge (\sim p \vee r) \rightarrow (q \vee r)$. 2
What kind of proposition is it?
- ✓ 10. Using quantifier express the following statements as logical expression: 1+2+2
- ✓ i) No monkey knows calculus
 - ✓ ii) Everyone has exactly one best friend.
 - ✓ (iii) A negative real number does not have a square root that is a real number.
- ✓ 11. Using rules of inference, prove the argument: 3.5
"Linda, a student in this class has own a red convertible. Everyone, who owns a red convertible has gotten at least one speeding ticket. Therefore, someone in this class has gotten a speeding ticket." $R(\text{Linda}) \wedge \forall x (R(x) \rightarrow T(x))$
- ✓ 12. Define argument with an example. 2

Electrical Circuits (EEE - 1103)
In course Exam

Total Marks:25

Time: 1 Hour 15minutes

Answer **all** questions:

1. Explain the temperature effect on the resistance of conductors, semiconductors, and insulators. 3
2. Find the unknown quantities, E , I_1 , I_3 , R_2 , R_3 and P_{R_3} for the networks in Fig. 1. 3

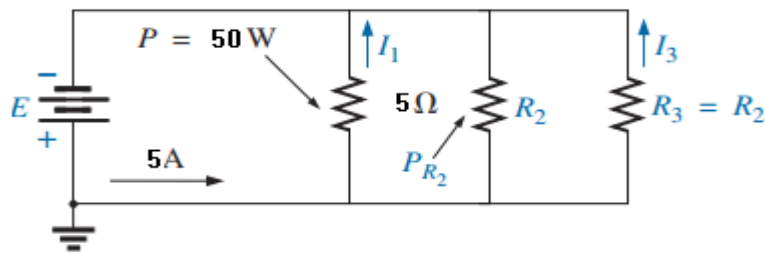


Fig. 1

3. For the configuration in Fig. 2: 4
 - a. Find the currents I_2 , I_5 , and I_6 .
 - b. Find the voltages V_4 and V_6 .

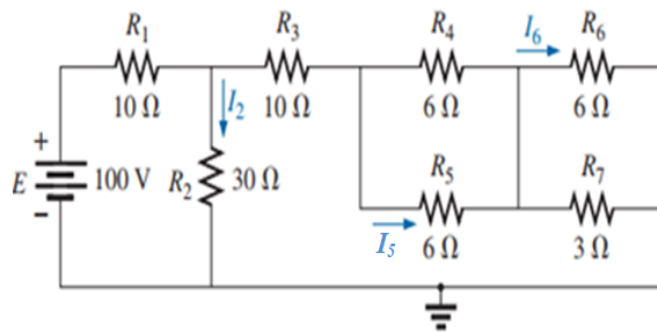


Fig. 2

4. For the network in Fig. 3: 4.5
 - a. Determine voltages V_a , V_b , V_c , V_{ac} and V_{bc} .
 - c. Find current I_2 and current I_{s3}

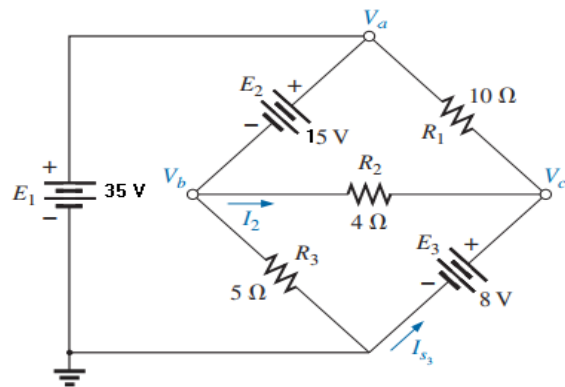


Fig. 3

5. For the multiple ladder configuration in Fig. 4:
 a. Determine I , I_4 , I_6 and I_{10} .

4

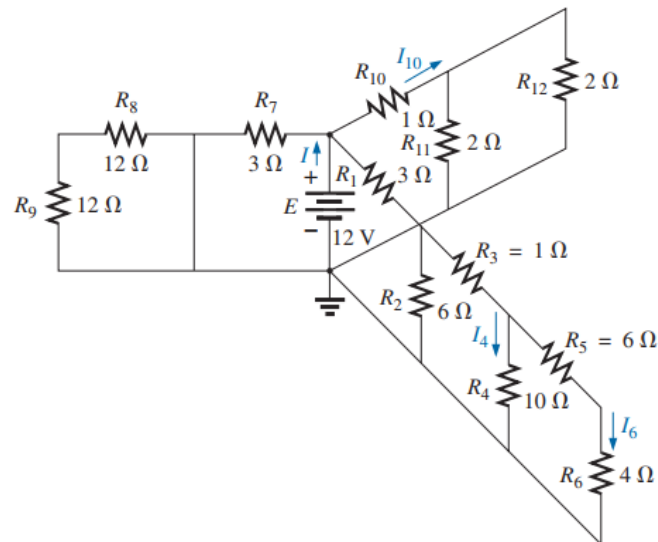


Fig.4

6. Write the mesh equations for each of the networks in Fig. 5. Using determinants, solve for the loop current I_2 . 6.5

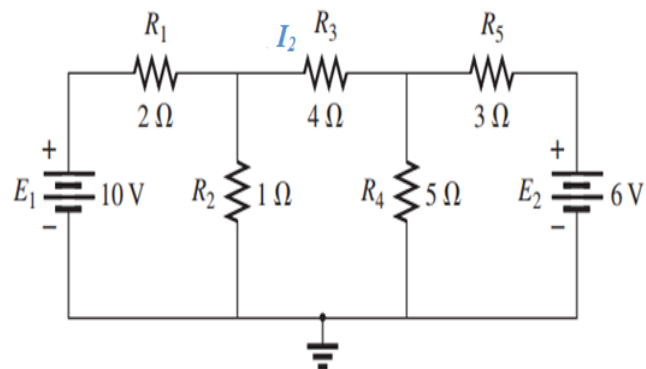


Fig.5

University of Dhaka
Department of Computer Science and Engineering
1st Year 1st Semester Incourse Examination, 2019-20
Course: MATH-1105: Differential and Integral Calculus

Time: 40 minutes

Total Marks: 20

There are six (6) questions. Answer any four of them. Marks are given in the right margin.

- 1** Sketch the graph of the function $f(x) = 1 - 2^x$. Draw the vertical and/or horizontal asymptote line(s), if exists. **[5]**
- 2** Prove whether the following functions are even, or odd, or neither: **[5]**
(i) $f(x) = x - 1$
(ii) $f(x) = \frac{1}{x}$
- 3** Using the definition of continuity, determine whether the following function is continuous at $x = 2$: **[5]**
 $f(x) = \frac{x^2 - 4}{x - 2}$ if $x \neq 2$; and 3 if $x = 2$.
- 4** Calculate $\lim_{x \rightarrow -\infty} f(x) = \frac{3x^2 - x}{4x^3 - 7}$. You must mention the appropriate limit laws used in your derivation. **[5]**
- 5** Given $f(x) = |3x|$, is this function differentiable at $x = 0$? Why or why not? You must justify your answer mathematically (i.e., algebraically), not geometrically. **[5]**
- 6** A 13 ft ladder is leaning against a wall. If the top of the ladder slips down the wall at a rate of 2 ft/s, how fast will the foot be moving away from the wall when the top is 5 ft above the ground? **[5]**

University of Dhaka
Department of Computer Science and Engineering
1st Year 1st Semester Incourse Examination, 2020
CSE 1101: Fundamentals of Computers and Computing

Total Marks: 100 Time: 80 Minutes

Name		Roll No	
------	--	---------	--

.....
..... Answer all the questions. Anything, written outside the given box, will
not be considered as valid answer. Do not write anything here:

.....
.....

1. Write short notes on Keyboard and Printer. [10]

Keyboard:	Printer:
-----------	----------

2. List the characteristics of *Star* and *Ring* topologies. [10]

Star:	Ring:
-------	-------

3. Point out three major technological advancements of the Fourth Generation computers
comparing to the Third Generation Computers. [10]

4. Describe the types of Memory in a Computer System. [10]

5. Differentiate between the Static Random Access Memory (SRAM) and the Dynamic Random Access Memory (DRAM). [10]

6. List the characteristics of the Application Software. [10]

7. "Basically, Intranet and Internet have no major differences" – give your opinion with proper logic. [10]

8. The number of users in the different social medias are increasing exponentially. As a result, the privacy and the security, two of the most important aspects in human life, are becoming more concerning day by day. It is believed that one can ensure his/her privacy and security to some extent abiding by some simple practices. – What do you think? Explain with proper reasoning. [10]

9. Consider 32-bit floating point number system. Convert the following decimal values using IEEE 754 format and represent the 32-bit strings in hexadecimal (Base-16). [10]

SL	Given Decimal Number	32-bit IEEE 754 formatted value in Base-16
1	3.1416	
2	8.3144	

10. Consider the Machine Instructions for some Machine Language below.

Opcod e	Operan d	Descriptions
0	000	RESET all the register values to 0.
1	RXY	LOAD the value XY to the register no R.
2	RXY	LOAD the value from memory address XY to the register no R.
3	RXY	STORE the value to the memory address XY from the register no R.
4	RST	ADD the integer values from register no S and T and STORE the result into the register no R.
5	RST	ADD the float values from register no S and T and STORE the result into the register no R.

6	RST	GET the integer values from register no S and T and STORE the AND result into the register no R.
7	RST	GET the integer values from register no S and T and STORE the OR result into the register no R.
8	RS0	GET the integer value from register no S and STORE the NOT (Complement) result into the register no R.
9	RST	GET the integer values from register no S and T and STORE the XOR result into the register no R.
A	RSX	GET the integer values from register no S and STORE the X bit RIGHT shifted result into the register no R.
B	RSX	GET the integer values from register no S and STORE the X bit LEFT shifted result into the register no R.
C	000	HALT the program

Write a valid sequence of machine instructions to compute the value of the
expression, $4 \times 32 - 128 / 8 + 7$

, that stores the result in Register no 0.

Note that the very first and the very last instructions of your sequence should be 0000 and C000, respectively. [10]