

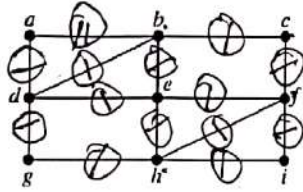
Marks: 30

Time: 90 m

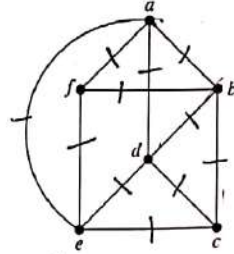
1. Is it possible to draw a graph with vertices of degree 0, 1, 1, 2, 3, 3? 2

If possible draw the graph.

2. Is it possible to draw Euler circuit of the graph G1? If possible show the circuit. 2.5



G1



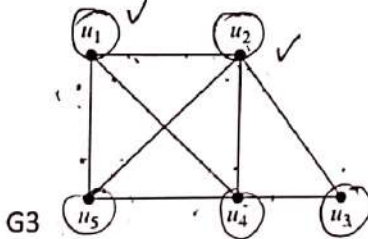
G2

3. Draw the planar representation of G2. Compute number of regions of this graph. 2

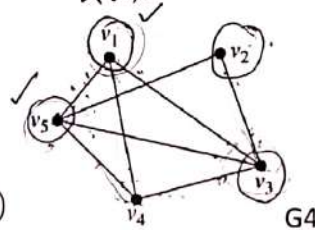
4. What is the chromatic number of? 2

5. Find number of vertices and edges of? 2

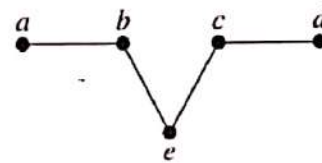
6. When becomes a regular graph? 1



G3



G4



G5

7. Are G3 and G4 are isomorphic to each other? Explain your answer. 5

8. Is G5 a bipartite graph? Explain your answer. 1.5

9. Express each of these statements using quantifiers:

a) All Swedish movies are not serious. (Domain= Swedish movies) 4

b) No one can keep a secret. (Domain= All persons)

10. Express the following statement using mathematical and logical operators, predicates, and quantifiers, where the domain consists of all integers.

"The difference of two positive integers is not necessarily positive." 1.5

11. Prove the following argument using rule of inferences. 4

"Linda is an excellent swimmer. If Linda is an excellent swimmer, then she can work as a lifeguard. Therefore, Linda can work as a lifeguard."

12. Show that $p \leftrightarrow q$ and $(p \wedge q) \vee (\neg p \wedge \neg q)$ are logically equivalent. 2

13. State the contrapositive of this conditional statement. 1.5

"A positive integer is a prime only if it has no divisors other than 1 and itself"

Department of Computer Science and Engineering

University of Dhaka

Electrical Circuits (EEE - 1103)

Incouse Exam

Total Marks:25

Time: 1 Hour 25 minutes

Answer all questions:

1. The voltage drop across a transistor network is 22 V. If the total resistance is 5.6 k Ω , what is the current level? What is the power delivered in hp? How much energy is dissipated in 3 hours? 2
2. Find the unknown quantities, I_2 , I_3 , I_6 , V_3 , V_4 and V_6 for the following network shown in Fig. 1. 3

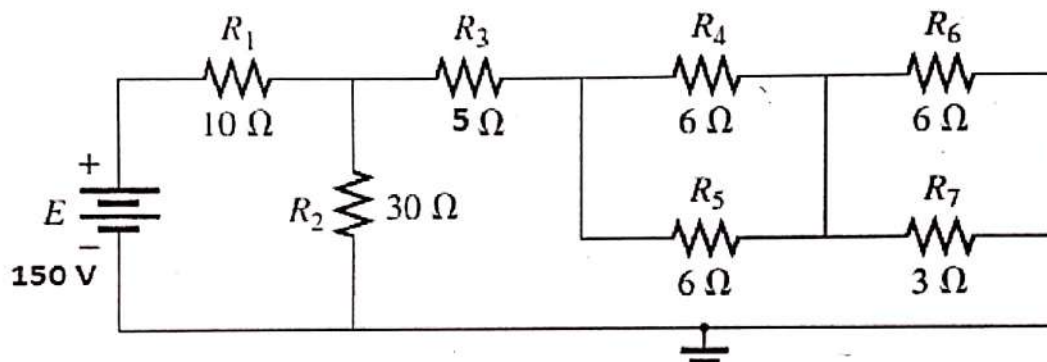


Fig. 1

3. Using Branch-current analysis, find the current through each resistor for the following network shown in Fig. 2 4

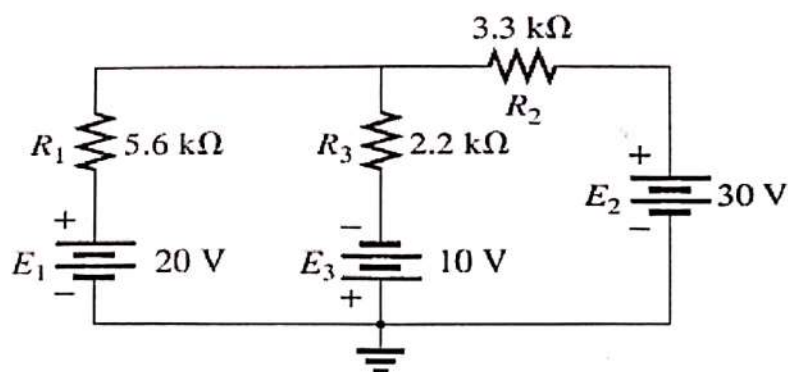


Fig. 2

4. Write the Mesh equations and solve for the loop currents for the following network shown in Fig. 3. 5

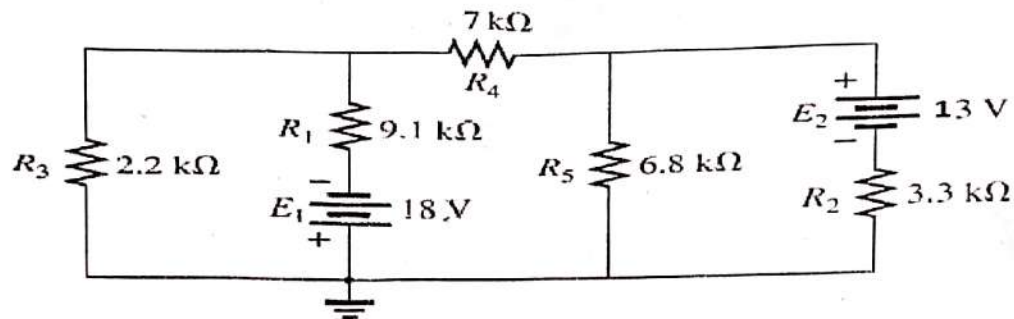


Fig. 3

5. Write the nodal equations and solve for the nodal voltages for the following network shown in Fig. 4. 5

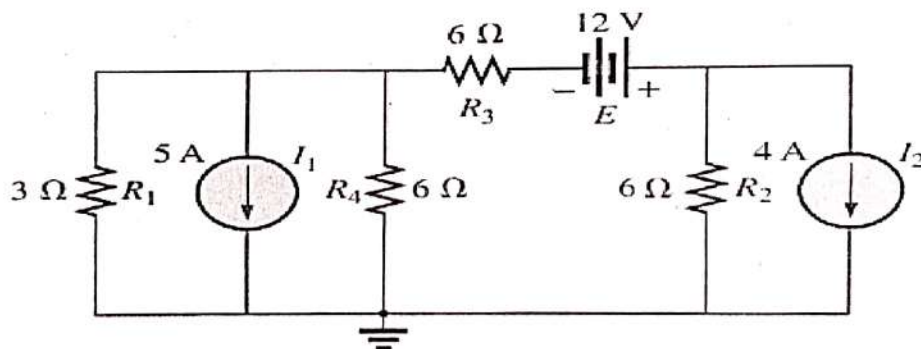


Fig.4

6. a. Explain Supermesh current with an example. 3
b. Using the Supermesh approach, find the current through each element for the following network shown in the Fig. 5 3

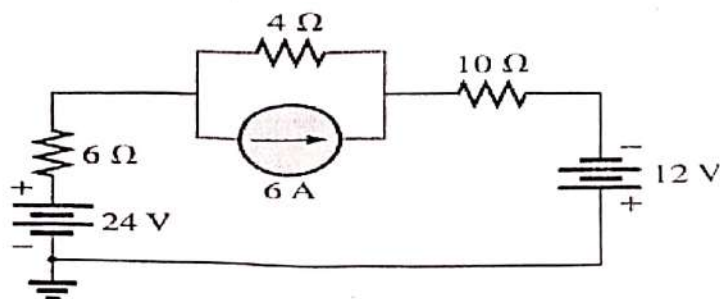


Fig.5

In course Examination
Department of Computer Science and Engineering, University of Dhaka
MATH 1105: Differential and Integral Calculus
Total Marks: 40
Time: 1 Hour 10 Minutes

✓ 1. Sketch the Graph of the functions. Also find their domain and range.

5 x 2

i. $f(x) = e^{-x} + 1$ ii. $f(x) = \ln(x+1)$

✓ 2. Consider the following function:

3 x 2

$$f(x) = \begin{cases} 1/(x+2), & x < -2 \\ x^2 - 5, & -2 < x \leq 3 \\ \sqrt{x+13}, & x > 3 \end{cases}$$

Evaluate the limits: a. $\lim_{x \rightarrow -2} f(x)$ b. $\lim_{x \rightarrow 3^+} f(x)$

✓ 3. Find the horizontal and vertical asymptotes of the graph of the function

5

$$f(x) = \frac{\sqrt{2x^2 + 1}}{3x - 5}$$

✓ 4. What is the difference between a secant line and a tangent line. Mention two conditions where a function is not differentiable.

2.5
+
2.5

✓ 5. Apply L'Hospitals rule to evaluate :

7

(a) $\lim_{x \rightarrow 0^+} x \ln x$ (b) $\lim_{x \rightarrow \pi/4} (1 - \tan x) \sec 2x$

✓ 6. Find the local linear approximation of the function $f(x) = \sqrt{1+x}$ at $x_0 = 0$, and use it to approximate $\sqrt{0.9}$ and $\sqrt{1.1}$.

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