Please select related courses which you have done relevant to Full Chip Design. *

- [ ] Digital Logic Design/ Digital Electronics
- [ ] Analog Electronics / Analog Integrated Circuit
- [ ] Very Large Scale Integration (VLSI)
- [ ] Verilog/VHDL (coursework/certification)
- [ ] Programming Courses(C/C++/Python/Java etc)
- [ ] Other:

Skill And Interest

Select one option for the following questions. Select N/A if you do not have any knowle

HDL Knowledge *

- [x] Verilog
- [ ] SystemVerilog
- [ ] VHDL
- [ ] None
- [ ] Other:

Programming Knowledge *

- [ ] C
- [ ] C++
- [ ] Python

Programming Knowledge *

- [ ] C
- [x] C++
- [x] Python
- [ ] Java
- [ ] Others
- [ ] None

Which department/s within the Full Chip Design suits you most? *

**Select based on your interest and knowledge. If you do not have any idea about the work/d
please select "No Idea". The final decision will be made by the department only after careful
each candidates**

- [ ] Java
- [ ] Others
- [ ] None

Which department/s within the Full Chip Design suits you most? *

Select based on your interest and knowledge. If you do not have any idea about the work/department please select "No Idea". The final decision will be made by the department only after careful evaluation of each candidates

- [ ] RTL Design
- [ ] Digital verification
- [ ] Analog Mixed Signal Modeling and Validation
- [ ] Electronic Design Automation (EDA)
- [ ] No Idea

If you have selected any department on the last question, briefly specify your

- [ ] RTL Design
- [ ] Digital verification
- [ ] Analog Mixed Signal Modeling and Validation
- [ ] Electronic Design Automation (EDA)
- [x] No Idea

If you have selected any department on the last question, briefly specify your reasons.

Your answer

State your reasons to join the Semiconductor Industry. *

Your answer

Why do you want to join Ulkasemi? *

Your answer

If you have selected any department on the last question, briefly specify your reasons.

Your answer

State your reasons to join the Semiconductor Industry. *

Your answer

Why do you want to join Ulkasemi? *

Your answer

Where do you want to see yourself in next five and ten years? Write your goals for both. *

Your answer

Expertise Assessment

Please state your expertise on what you know in HDL and programming language based on your selection in last section

[HDL] Select based on you knowledge on Verilog *

- [ ] Beginner
- [ ] Intermediate
- [ ] Expert
- [ ] N/A

[HDL] Select based on you knowledge on SystemVerilog *

- [ ] Beginner
- [ ] Intermediate
- [ ] Expert

Please state your expertise on what you know in HDL and programming language based on your selection in last section

[HDL] Select based on you knowledge on Verilog *

- [ ] Beginner
- [ ] Intermediate
- [ ] Expert
- [ ] N/A

[HDL] Select based on you knowledge on SystemVerilog *

- [ ] Beginner
- [ ] Intermediate
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- [ ] N/A

Please state your expertise on what you know in HDL and programming language based on your selection in last section

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- [ ] N/A

[HDL] Select based on you knowledge on SystemVerilog *

- [ ] Beginner
- [ ] Intermediate
- [ ] Expert
- [ ] N/A

[HDL] Select based on you knowledge on VHDL *

- [ ] Expert
- [ ] N/A

[HDL] Select based on you knowledge on VHDL *

- [ ] Beginner
- [ ] Intermediate
- [ ] Expert
- [ ] N/A

[Programming Knowledge] Select based on you knowledge on C *

- [ ] Beginner
- [ ] Intermediate
- [ ] Expert
- [ ] N/A

- [ ] Intermediate
- [ ] Expert
- [x] N/A

[Programming Knowledge] Select based on you knowledge on C++ *

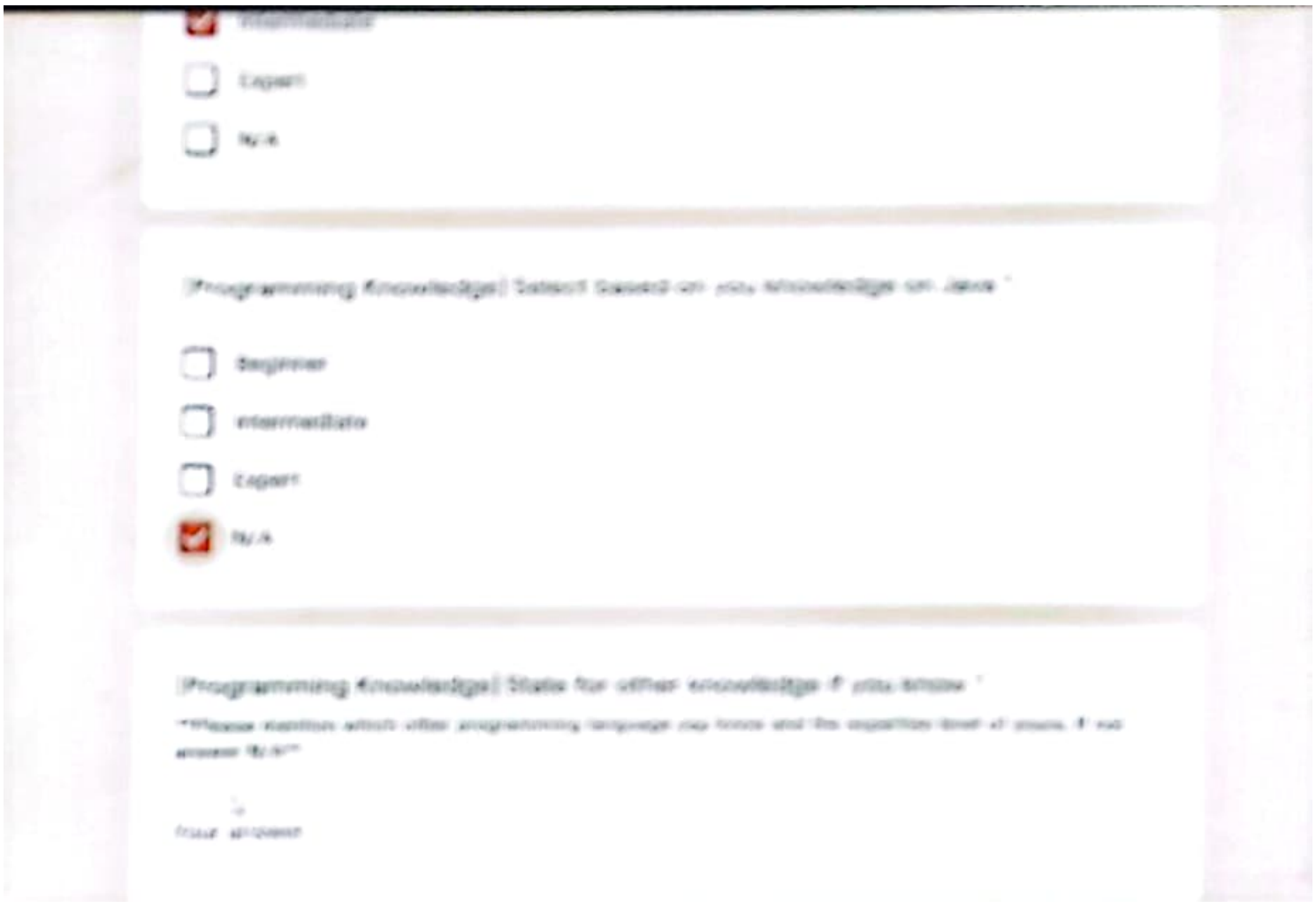
- [ ] Beginner
- [x] Intermediate
- [ ] Expert
- [ ] N/A

[Programming Knowledge] Select based on you knowledge on Python *

- [ ] Beginner
- [x] Intermediate
- [ ] Expert
- [ ] N/A

[Programming Knowledge] Select based on you knowledge on Java *

- [ ] Beginner



- [x] Intermediate
- [ ] Expert
- [ ] N/A

[Programming Knowledge] Select based on you knowledge on Java *

- [ ] Beginner
- [ ] Intermediate
- [ ] Expert
- [x] N/A

[Programming Knowledge] State for other knowledge if you know *

Please mention which other programming language you know and the expertise level of yours, If not answer N/A

Your answer

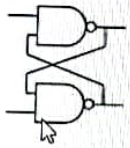
Back Next

The name and photo associated with your Google account will be recorded when you upload files and submit this form. Your email is not part of your response.

Section 1: Analog and Digital Circuits

Question 1 (5 min)

Is the circuit combinational logic or sequential logic? Explain in a simple fashion what the relationship is between the inputs and outputs. What would you call this circuit?



Your answer

Guidelines for Question 2- 8

Please write the answers of following questions in extra pages and take snap of them and put all snaps in a single PDF file and upload them at the end of last section

Question 2 (10 min)

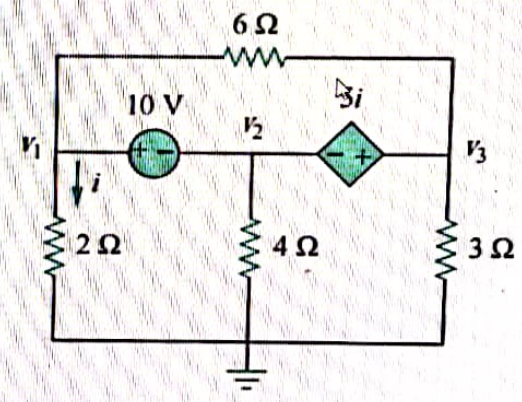
Find $v1$, $v2$, and $v3$ in the circuit.

Guidelines for Question 2- 8

Please write the answers of following questions in extra pages and take snap of them and put all snaps in a single PDF file and upload them at the end of last section

Question 2 (10 min)

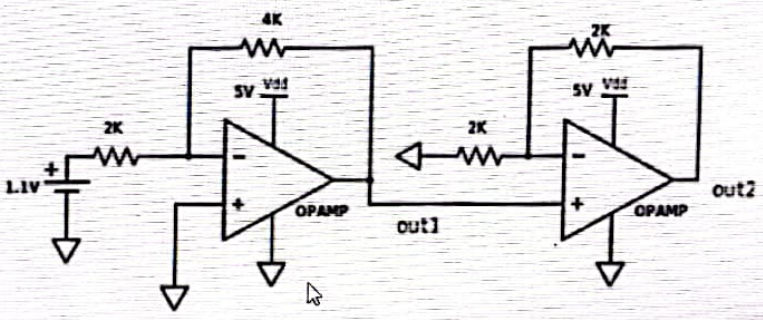
Find v1, v2, and v3 in the circuit.



Question 3 (5min)

Question 3 (5min)

Find the voltage of out1 and out2.



Question 4 (5min)

Sketch a transistor-level circuit for an AND gate. Use a minimum number of transistors.

Your answer

Question 10 (15 min)

Write a program in any programming language to calculate and print the Electricity bill of a given customer. The unit consumed by the user should be taken from the keyboard and display the total amount to pay to the customer. The charge are as follow :

Unit	Charge/unit
upto 199	@1.20
200 and above but less than 400	@1.50
400 and above but less than 600	@1.80
600 and above	@2.00

If bill exceeds tk 400 then a surcharge of 15% will be charged and the minimum bill should be of tk 100/-

Sample input:

800

Sample output:

unit Consumed :800

Amount Charges @tk 2.00 per unit : 1600.00

Surcharge Amount : 240.00

Net Amount Paid By the Customer : 1840.00

Your answer

Question 11 (5 min)

Question 11 (5 min)

Please also write a short description based on your output

What will be the output of the following code:

```
#include <stdio.h>
int main() {
int a = 15, b;
b = (a++) + (a++);
a = (b++) + (b++);
printf("a=%d b=%d", a, b);
return (0);     }
```

Your answer

Section 2: Hardware Description Language

Question 12 (20 min)

Write an HDL code for the following specifications. Write a linear testbench to verify the design.

Input: clk, reset_n, A, B

Output : AEQB, AGTB, ALTB

The block has an active low asynchronous reset and works on the posedge of clock. The block takes two 4 bit numbers A,B and compares them. There are 3 single bit outputs and they are 1 in the following conditions otherwise 0.

AEQB i.e. A equals B

AGTB i.e. A greater than B

ALTB i.e. A less than B

Your answer

Please submit your answer script (PDF) here *

Scan all your answers from the answer script and upload them (in order) as a single PDF file.

Click After Submitting Test

1. **Implement a full adder using a 3 to 8 decoder. Write down the boolean expression for carry and sum only** **(6)**

Your answer

2. **Name the two forms of Boolean expression? Find that two forms of Boolean expression from the following truth table.** **(5)**

expression from the following truth table. (3)

A	B	C	Output
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

Your answer

3. **How can the threshold voltage of MOSFET be changed?** **(5)**

Your answer

4. **What is the meaning of "the channel is pinched off"?** **(4)**

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Your answer

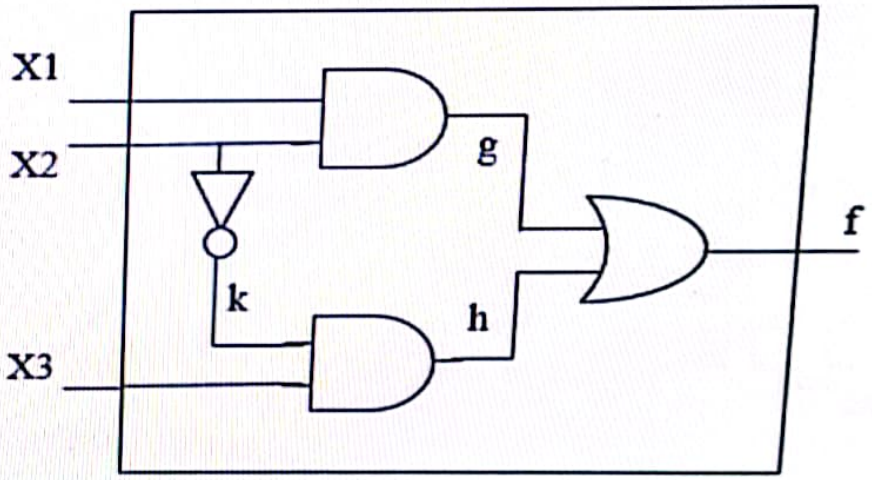
4. **What is the meaning of "the channel is pinched off"?** **(4)**

4. **What is the meaning of "the channel is pinched off"?**

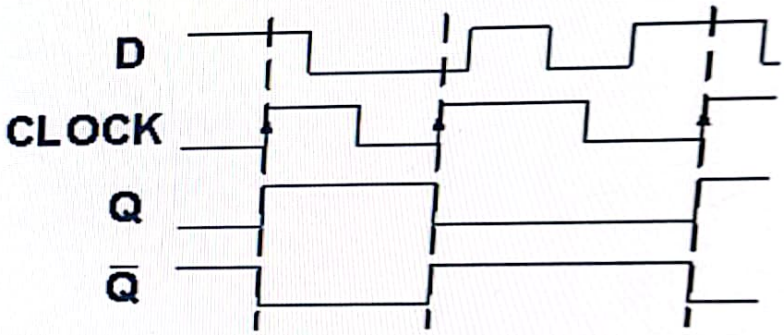
Your answer

5. **Write a verilog code for the following circuit**

5. **Write a verilog code for the following circuit**



6. **Write a verilog code that can generate the following timing diagram** **(5)**



Your answer

7. **Observe the truth table. Write down a verilog code for the circuit that generates the following truth table** **(5)**

Input			Output	
X	Y	Z	A	B
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1

X	Y	Z	A	B
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

8. Find the value of out=? When select=0 and select=1

```
module pnr (
input [2:0] a, b, c,
input [1:0] select,
output reg [2:0] out,
);
 always @ (a, b, c, select) begin
   case(select)
      2'b01     : out=a;
      2'b10     : out=b;
      2'b11    : out=c;
      default   : out =0;
   endcase
 end
endmodule
```

18. **FInd the next number in the pattern?** **(5)**

2,3,7,17,31, ___

Your answer

*

19. **If 9th March 2011 was Sunday, what was the day of the week on 1st March 2008?** **(4)**

*

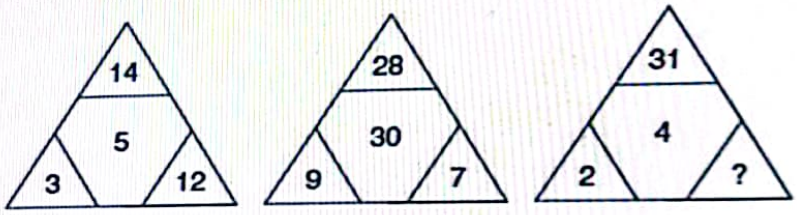
19. If 9th March 2011 was Sunday, what was the day of the week on 1st March 2008? (4)

Your answer

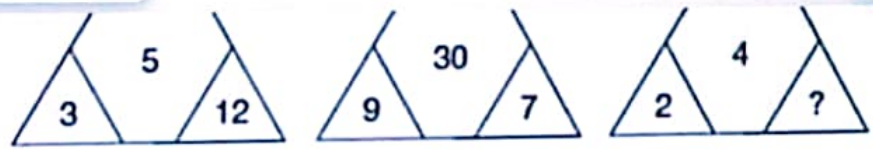
*

20. Which one should replace the question mark? (5)

20. **Which one should replace the question mark?** **(5)**



Your answer



Your answer

Thank You for Cooperation. Wish you all the best !!!

End Up The Paper

Back Submit Clear form

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Scrolling Issues? If you are finding it difficult to scroll, try scrolling **inside**

8. **Find the value of out=? When select=0 and select=1** **(5)**

```
module pnr (
input [2:0] a, b, c,
input [1:0] select,
output reg [2:0] out,
);
 always @ (a, b, c, select) begin
  case(select)
     2'b01     : out=a;
     2'b10     : out=b;
     2'b11    : out=c;
     default   : out =0;
  endcase
```

9. **Calculate the frequency of the following code**

```
`timescale 1ns/100ps
module gen1;
reg a;
initial a = 0 ;
always #2 a = ~a ;
endmodule
```

Your answer

10. **Find the output of the following program** **(4)**

```
#include <stdio.h>
void main()
{
for (int i=1;i<=4;i++)
        {
        switch (i)
                {
case 1:
        printf("a/n");
        break;
```

```
{
for (int i=1;i<=4;i++)
        {
        switch (i)
                {
case 1:
        printf("a/n");
        break;
case 2:
        printf("b/n");
        break;
case 3:
        printf("c/n");
        break;
case 4:
        printf("\nd");
        break;
}
}
}
```

11. **Find the output of the following code**

```
#include <iostream>
using namespace std;
int main()
{
   int i, j, k;
   int n = 5;
   for (k = 1; k <= n; k++)
   {
     for(j = 1; j <= n-k; j++)
         cout << ' ';
     for (i = 1; i <= 2*k-1; i++)
         cout << "*";
     cout << endl;
   }
   return 0;
}
```

12. **Write a program to find the factors of a given number**

(Example: 1,2,3,6 are the factors of number 6)

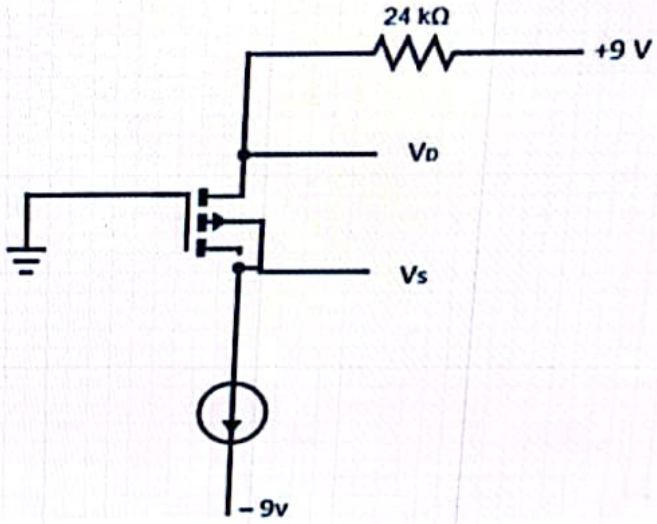
Your answer

13. **A gas station has the following price list**
    a. **Diesel 80 tk/ltr**
    b. **Petrol 100 tk/ltr**
    c. **Compressed gas 50 tk/cc**

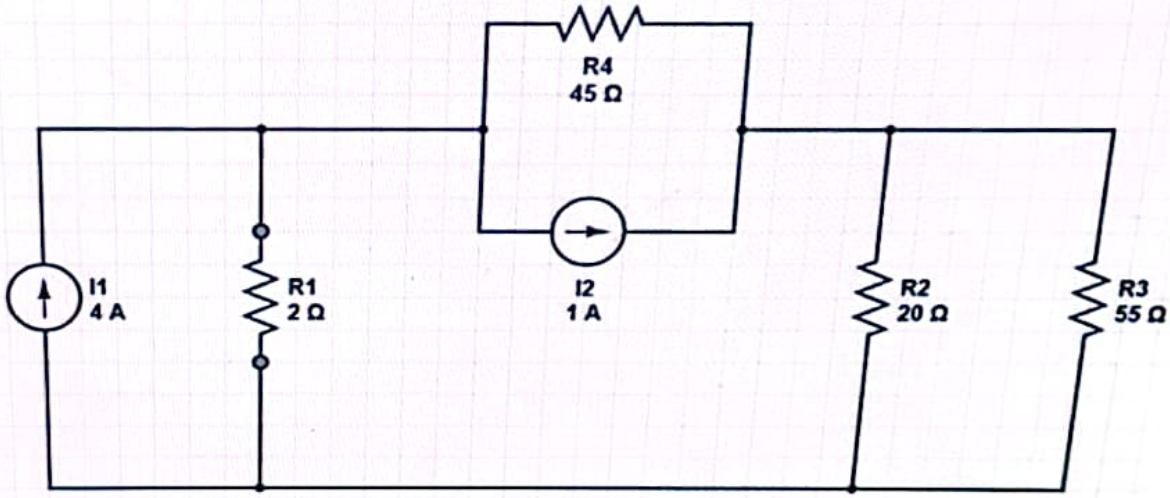
Write a code to calculate the final price to pay of bought amoun

Your answer

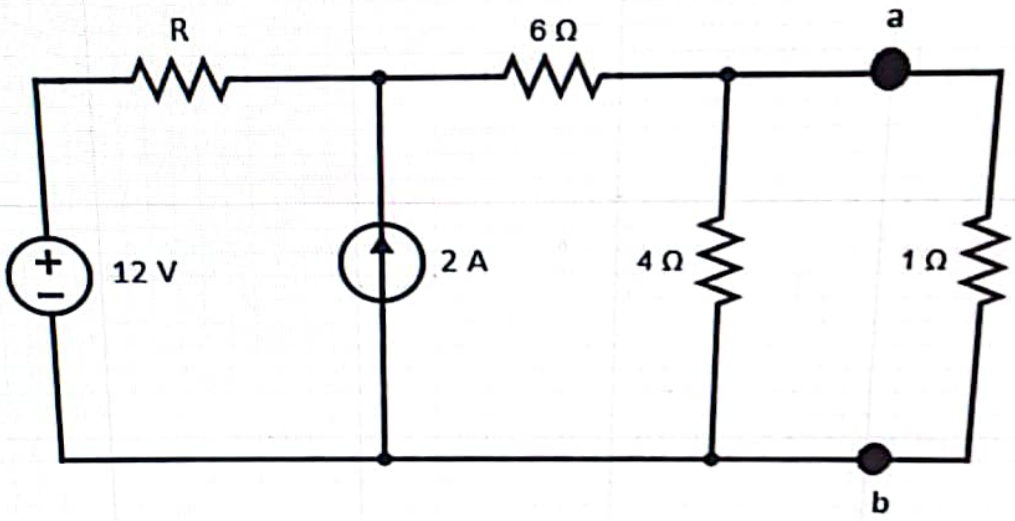
14. The transistor parameters are V_{TN} = 0.6 V and n = 0.2 mA / V^2, find V_S and V_D. (5)



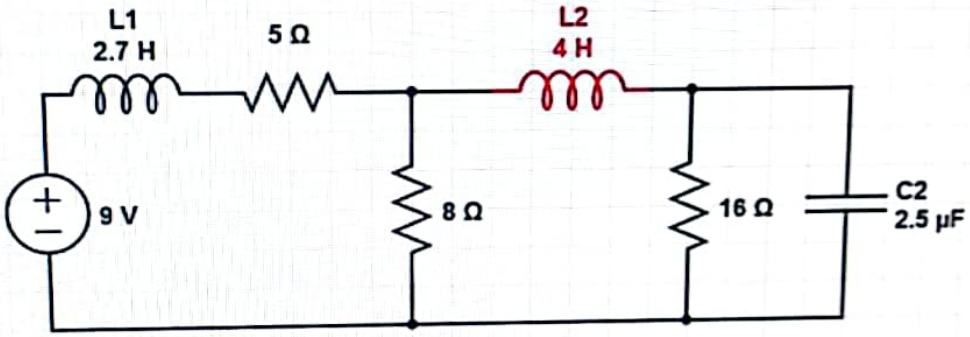
15. **Find the Voltage across R1 and R2 in the following circuit** **(5)**



16. **The power dissipated across the 1 Ω is 2.25 W. If the open circuit voltage between a & b is 6 V, then R = ?** **(5)**



17. **Find the current through L2.** **(5)**



Your answer

*

18. **FInd the next number in the pattern?** **(5)**