Course Code: CSE251
Electronic Devices & Circuits
Section: 07
Faculty: TAV

Set
B

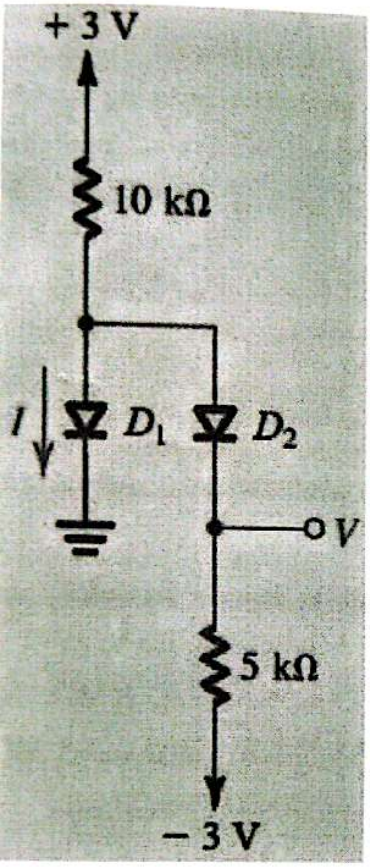
Assessment: *Quiz 2*
Duration: 30 minutes
Date: July23, 2025
Full Marks: 20

- ✓ No washroom breaks. Phones must be turned off. Using/carrying any notes during the exam is not allowed.
- ✓ At the end of the exam, both the **answer script** and the **question paper** must be returned to the invigilator.
- ✓ All the questions are compulsory. Marks allotted for each question are mentioned beside each question.
- ✓ Symbols have their usual meanings.

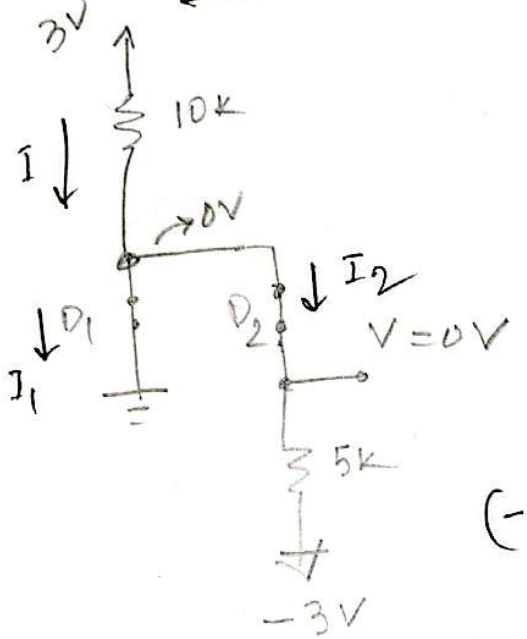
■ Question 1 of 2

[CO3] [10 marks]

For the circuits shown below, using ideal diode model, find the values of the voltages and currents indicated.



D_1, D_2 ON



$$I = \frac{3-0}{10}, \quad I_2 = \frac{0-(-3)}{5}$$

$$I = 0.3, \quad I_2 = 0.6$$

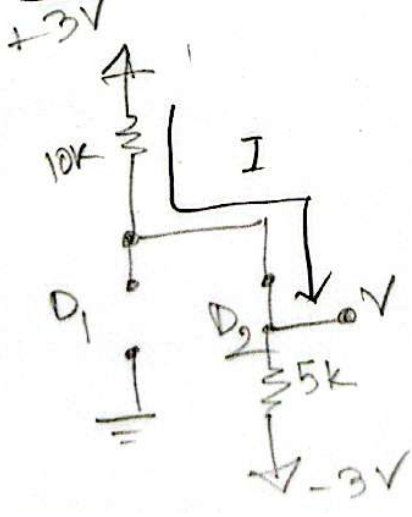
$$I = I_1 + I_2$$

$$\Rightarrow I_1 = I - I_2$$

$$= 0.3 - 0.6 = -0.3\text{mA}$$

$(-I_1)$ flows from n to p.
So, assumption wrong

D_1 off, D_2 ON



$$I = \frac{3-V}{10} = \frac{V-(-3)}{5}$$

$$\Rightarrow 3 - V = 2V + 6$$

$$\Rightarrow 3V = -3$$

$$\Rightarrow V = -1$$

$$\therefore I = \frac{3-(-1)}{10} = 0.4\text{mA}$$

I positive $\rightarrow D_2$ ON

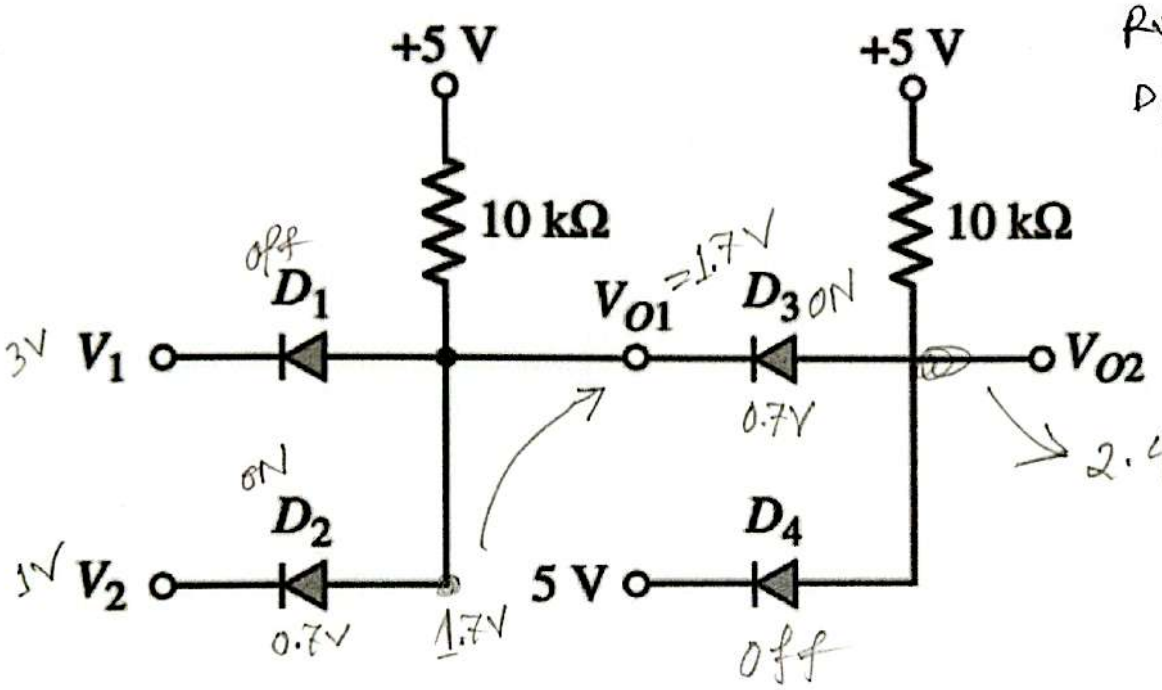
$D_1 \Rightarrow V_n - V_p = 0 - (-1) = 1 \rightarrow V_n > V_p$ so, D_1 off

Rubric:
- Assumption → 2
- Replace with short/open → 2
- Correct step for I, V → 2.5
- Correct value → 1
- Proof → 2.5

■ Question 2 of 2

[CO3] [5+5 marks]

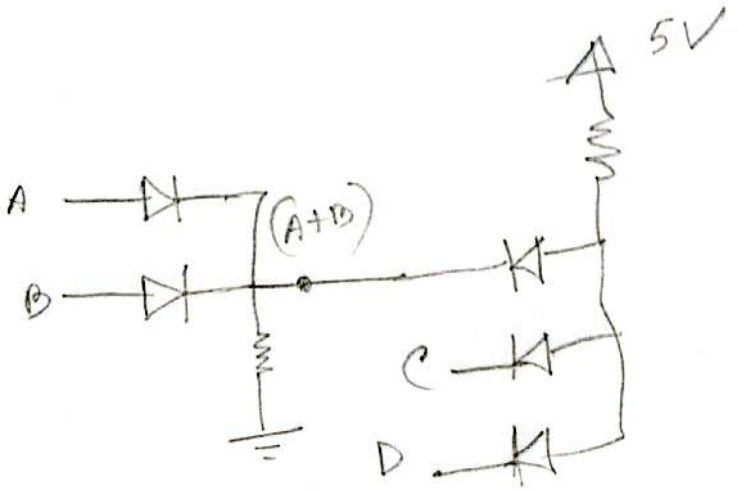
(a) Design a circuit to implement (A+B).C.D using diodes
(b) Determine V_{O2} for the circuit below if V_1 = 3V and V_2 = 1 V. Use CVD model with V_{DO}= 0.7 V.



Rubric:
D_1 off, D_2 ON → 1.5
D_3 ON, D_4 off → 1.5
V_{O1} → 1
V_{O2} → 1

(b) both AND Gate structure :

(a)



Rubric
(A+B) → 2
(A+B).C.D → 2
Voltage and ground shown → 1