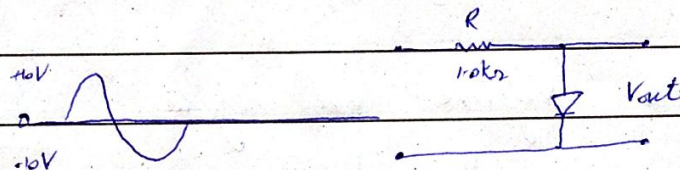


C.W ☐H.W ☐TEST ☐Day: ☐☐☐☐☐☐Date: ☐☐☐☐☐☐☐☐

Umar Hayyat  
2019-EE-360

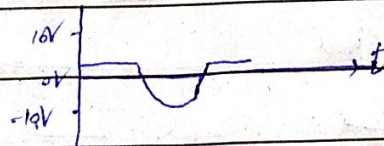
Q.No.31



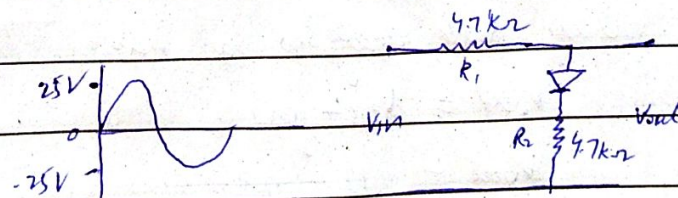
At positive half cycle diode is forward bias after 0.7V and its like a short circuit. So, output after 0.7V is zero.

In negative half cycle, diode is reverse bias and diode act like a open circuit so, output voltage equal to the input voltage.

Wave form:



Q.No.32



For +ve half cycle.

Using node analysis.

$$\frac{V_{out} - V_{in}}{4.7} + \frac{V_{out} - 0.7}{4.7} = 0$$

$$V_{out} - V_{in} + V_{out} - 0.7 = 0$$

$$2V_{out} = V_{in} + 0.7$$

$$V_{out} = \frac{V_{in} + 0.7}{2}$$



C.W ☐H.W ☐TEST ☐Day: ☐☐☐☐☐☐Date: ☐☐☐☐☐☐

$$V_{out} = \frac{V_{in} + 0.7}{2}$$

$$\therefore V_{in} = 25V$$

$$V_{out} = \frac{25 + 0.7}{2}$$

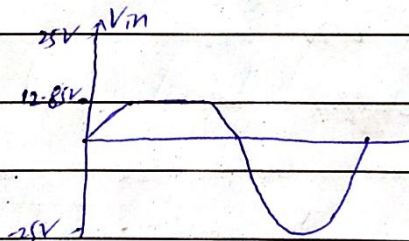
$$V_{out} = 12.85V$$

For Negative half cycle

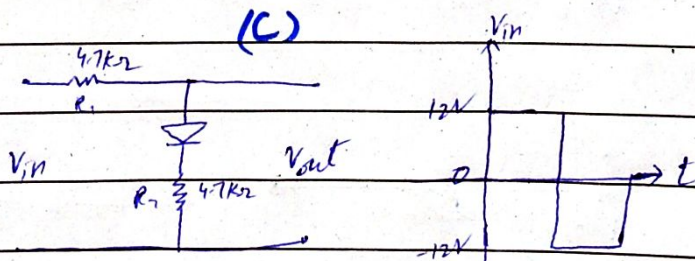
$$V_{out} = V_{in}$$

$$V_{out} = 25V$$

Wave form:



Q No 32:



Using Node analysis we have.

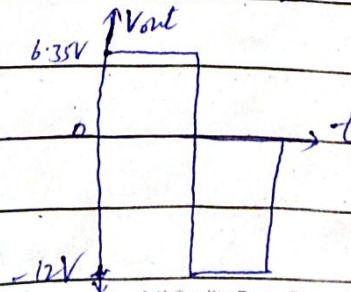
$$V_{out} = \frac{V_{in} + 0.7}{2}$$

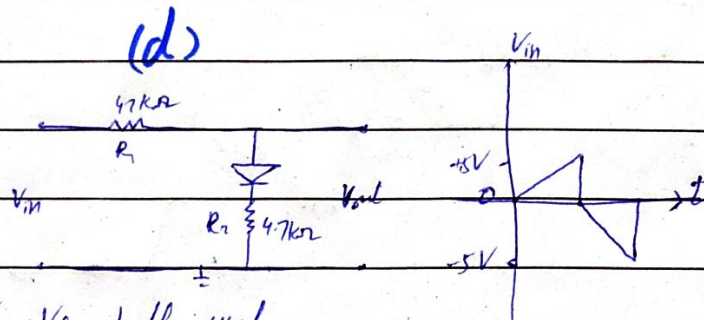
$$V_{out} = \frac{12 + 0.7}{2}$$

$$V_{out} = 6.35V$$

For -ve half cycle

$$V_{out} = V_{in} = 12V$$



C.W ☐H.W ☐TEST ☐Day: ☐☐☐☐☐☐Date: ☐☐☐☐☐☐

For +ve half cycle

$$V_{out} = \frac{V_{in} + 0.7}{2}$$

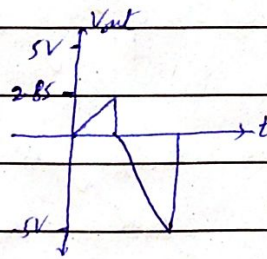
$$V_{out} = \frac{5 + 0.7}{2}$$

$$V_{out} = 2.85V$$

For -ve half cycle.

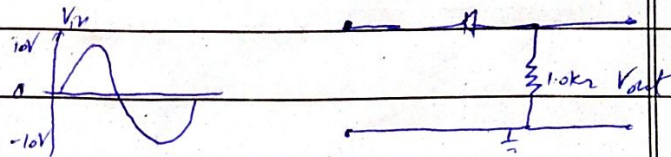
$$V_{out} = V_{in}$$

output.

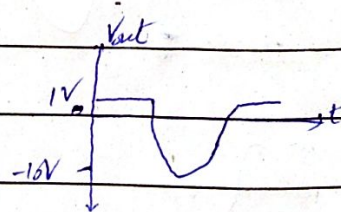


Q NO. 33

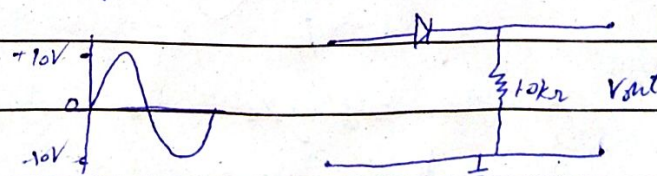
(a)



Output is positive clipper of 1V.



(b)



For +ve half cycle.

$$V_{out} = V_{in} - 0.7$$

$$V_{out} = 10 - 0.7$$

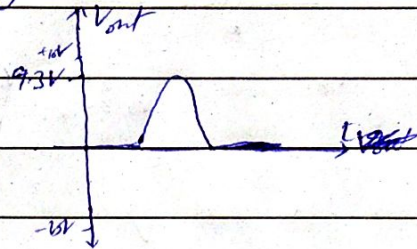
$$V_{out} = 9.3V$$



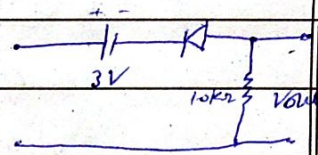
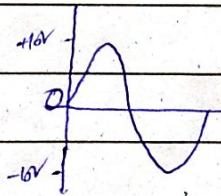
C.W ☐H.W ☐TEST ☐Day: ☐☐☐☐☐☐Date: ☐☐☐☐☐☐

For -ve half cycle

$$V_{out} = 0$$



(C)



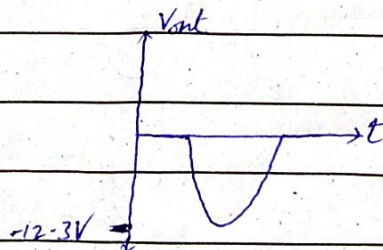
For positive half cycle, diode is reverse biased  
 $V_{out} = 0$

For negative half cycle.

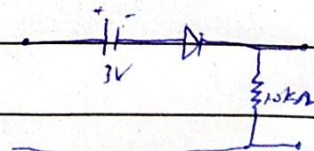
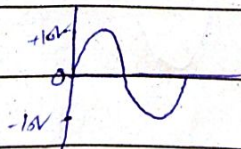
$$V_{out} = -10 - (V_{bias} - 0.7)$$

$$V_{out} = -10 - 2.3$$

$$V_{out} = -12.3V$$



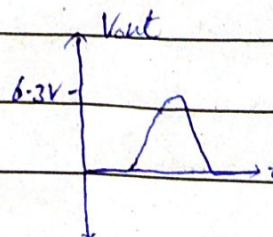
(d)



For +ve half cycle.

$$V_{out} = 10 - 3.7$$

$$V_{out} = 6.3V$$



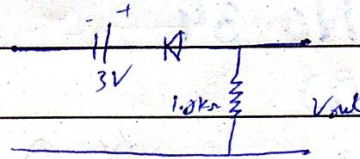
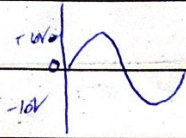
For -ve half cycle

$$V_{out} = 0$$



C.W ☐H.W ☐TEST ☐Day: ☐☐☐☐☐☐Date: ☐☐☐☐☐☐

(e)



For +ve half cycle.

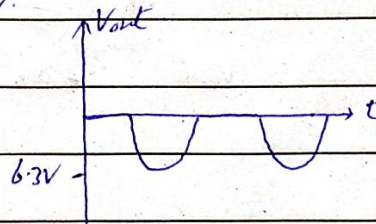
$$V_{out} = 0$$

For -ve half cycle.

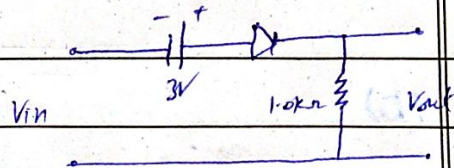
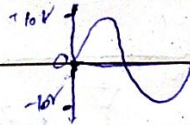
$$V_{out} = -10 + (3 + 0.7)$$

$$V_{out} = -10 + 3.7$$

$$V_{out} = -6.3V$$



(f)



For +ve.

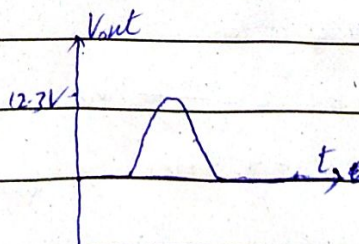
$$V_{out} = 10 + (3 - 0.7)$$

$$V_{out} = 10 + 2.3$$

$$V_{out} = 12.3V$$

For -ve half cycle.

$$V_{out} = 0$$

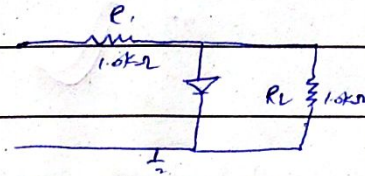
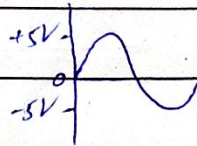




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Q No. 34

(a)



For +ve half cycle

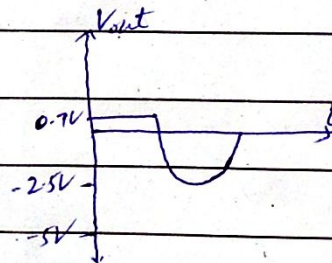
$$V_{out} = 0.7V$$

For -ve half cycle

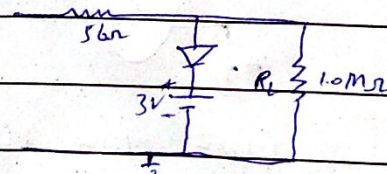
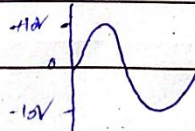
$$V_{out} = \left( \frac{R_2}{R_1 + R_2} \right) V_{in}$$

$$= \left( \frac{1}{1+1} \right) (-5)$$

$$V_{out} = -2.5V$$



(b)



For +ve half cycle

$$V_{R1} = V_{in} + 0.7$$

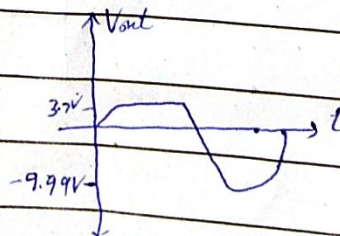
$$= 10 + 0.7$$

$$V_{R1} = 10.7V$$

For -ve half cycle

$$V_{R1} = \left( \frac{5M\Omega}{5k\Omega + 5M\Omega} \right) V_{in}$$

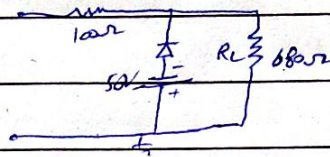
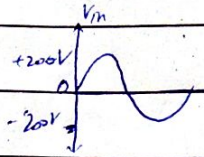
$$V_{out} = V_{R1} = -9.99V$$





C.W ☐H.W ☐TEST ☐Day: ☐☐☐☐☐☐Date: ☐☐☐☐☐☐

(C)



For +ve half cycle.

$$V_{out} = \frac{680}{780 + 100} \times 200$$

$$V_{out} - V_{D_s} = 174.35V$$

For -ve half cycle.

$$V_{out} = V_{D_s} = V_{D_s} + 0.7$$

$$= 50 + 0.7$$

$$V_{D_s} = 50.7V$$

