

## NEET SEMICONDUCTOR ELECTRONICS — SEMICONDUCTOR DIODE: FORWARD AND REVERSE BIAS, V-I CHARACTERISTICS — PYQS

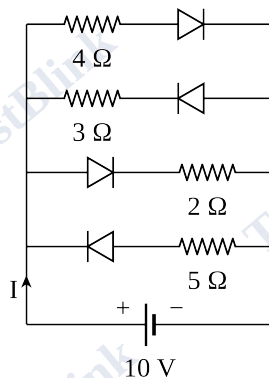
Max. Marks: 80

Questions: 20

### Section A (MCQ) — 20 questions

**Q.1** The current  $I$  in the circuit shown below is :  
(All diodes are ideal and identical)

[NEET (UG) 2026]

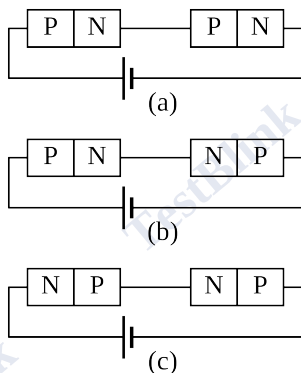


- (1)  $\frac{1}{3}$  A    (2)  $\frac{15}{2}$  A    (3)  $\frac{5}{3}$  A    (4)  $\frac{5}{9}$  A

Scan or tap for the full solution



**Q.2**



In the given circuits (a), (b) and (c), the potential drop across the two p-n junctions are equal in

[NEET (UG) 2022]

- (1) Circuit (a) only  
(2) Circuit (b) only  
(3) Circuit (c) only  
(4) Both circuits (a) and (c)

Scan or tap for the full solution



**Q.3** The increase in the width of the depletion region in a p-n junction diode is due to :

[NEET (UG) 2020]

- (1) reverse bias only  
(2) both forward bias and reverse bias  
(3) increase in forward current  
(4) forward bias only

Scan or tap for the full solution



**Q.4** In a p-n junction diode, change in temperature due to heating

[NEET 2018]

- (1) affects only reverse resistance  
(2) affects only forward resistance  
(3) does not affect resistance of p-n junction  
(4) affects the overall V - I characteristics of p-n junction

Scan or tap for the full solution



**Q.5** Which one of the following represents forward bias diode ?

[NEET 2017]

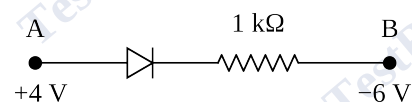
- (1)  $\begin{array}{c} -4\text{ V} \\ \text{---} \text{Diode} \text{---} R \end{array} \quad \begin{array}{c} -3\text{ V} \\ \text{---} R \end{array}$   
 (2)  $\begin{array}{c} -2\text{ V} \\ \text{---} \text{Diode} \text{---} R \end{array} \quad \begin{array}{c} +2\text{ V} \\ \text{---} R \end{array}$   
 (3)  $\begin{array}{c} 3\text{ V} \\ \text{---} \text{Diode} \text{---} R \end{array} \quad \begin{array}{c} 5\text{ V} \\ \text{---} R \end{array}$   
 (4)  $\begin{array}{c} 0\text{ V} \\ \text{---} \text{Diode} \text{---} R \end{array} \quad \begin{array}{c} -2\text{ V} \\ \text{---} R \end{array}$

Scan or tap for the full solution



**Q.6** Consider the junction diode as ideal. The value of current flowing through AB is

[NEET 2016 (Phase 1)]



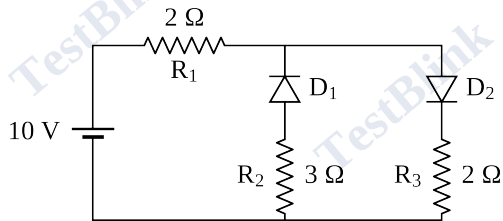
- (1)  $10^{-1}$  A    (2)  $10^{-3}$  A    (3) 0 A    (4)  $10^{-2}$  A

Scan or tap for the full solution



**Q.7** The given circuit has two ideal diodes connected as shown in the figure. The current flowing through the resistance  $R_1$  will be

[NEET 2016 (Phase 2)]



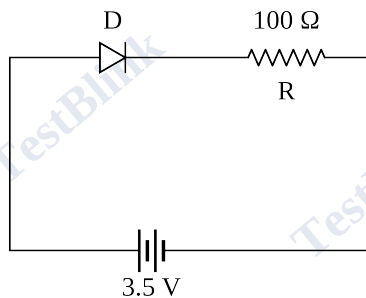
- (1) 2.5 A    (2) 10.0 A    (3) 1.43 A    (4) 3.13 A

Scan or tap for the full solution



- Q.8** In the given figure, a diode D is connected to an external resistance  $R = 100\ \Omega$  and an e.m.f. of 3.5 V. If the barrier potential developed across the diode is 0.5 V, the current in the circuit will be

[AIPMT 2015]



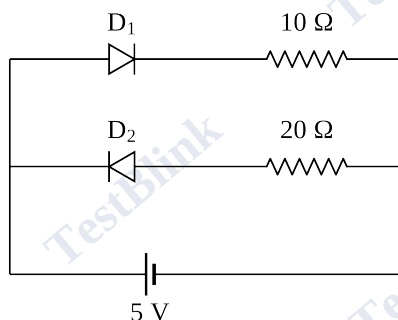
- (1) 20 mA    (2) 35 mA    (3) 30 mA    (4) 40 mA

Scan or tap for the full solution



- Q.9** Two ideal diodes are connected to a battery as shown in the circuit. The current supplied by the battery is

[AIPMT 2012 (Prelims)]



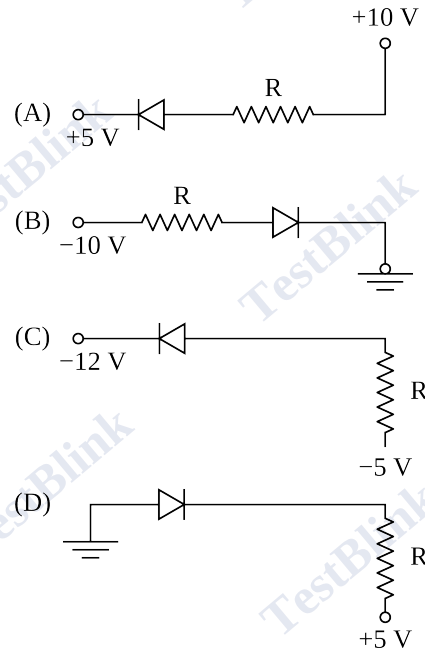
- (1) 0.75 A    (2) zero    (3) 0.25 A    (4) 0.5 A

Scan or tap for the full solution



- Q.10** In the following figure, the diodes which are forward biased, are

[AIPMT 2011 (Mains)]



- (1) (A), (B) and (D)    (2) (C) only  
(3) (C) and (A)    (4) (B) and (D)

Scan or tap for the full solution



- Q.11** In forward biasing of the p-n junction

[AIPMT 2011 (Prelims)]

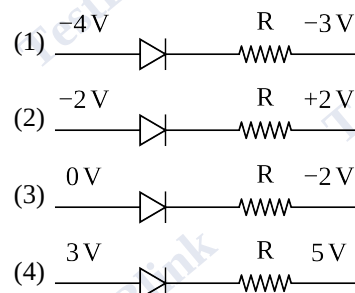
- (1) the positive terminal of the battery is connected to p-side and the depletion region becomes thick.
- (2) the positive terminal of the battery is connected to n-side and the depletion region becomes thin.
- (3) the positive terminal of the battery is connected to n-side and the depletion region becomes thick.
- (4) the positive terminal of the battery is connected to p-side and the depletion region becomes thin.

Scan or tap for the full solution



- Q.12** Which one of the following represents forward bias diode?

[AIPMT 2007]



Scan or tap for the full solution



- Q.13** Which one of the following represents forward bias diode ?

[AIPMT 2006]

- (1)
- (2)
- (3)
- (4)

Scan or tap for the full solution



**Q.14** Application of a forward bias to a p-n junction

[AIPMT 2005]

- (1) widens the depletion zone  
 (2) increases the potential difference across the depletion zone  
 (3) increases the number of donors on the n side  
 (4) decreases the electric field in the depletion zone.

Scan or tap for the full solution



**Q.15** Of the diodes shown in the following diagrams, which one is reverse biased?

[AIPMT 2004]

- (1)
- (2)
- (3)
- (4)

Scan or tap for the full solution



**Q.16** Reverse bias applied to a junction diode

[AIPMT 2003]

- (1) lowers the potential barrier  
 (2) raises the potential barrier  
 (3) increases the majority carrier current  
 (4) increases the minority carrier current

Scan or tap for the full solution



**Q.17** In a p-n junction

[AIPMT 2002]

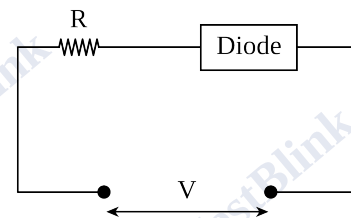
- (1) high potential at n side and low potential at p side  
 (2) high potential at p side and low potential at n side  
 (3) p and n both are at same potential  
 (4) undetermined.

Scan or tap for the full solution



**Q.18** For the given circuit of p-n junction diode, which is correct?

[AIPMT 2002]



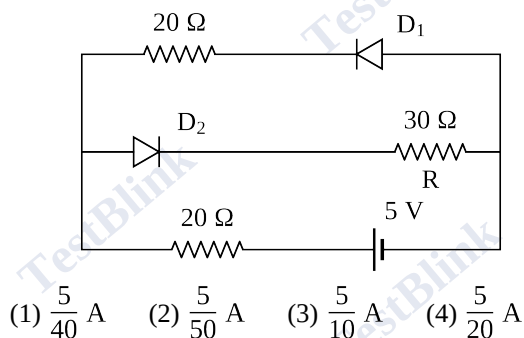
- (1) in forward bias the voltage across R is V  
 (2) in reverse bias the voltage across R is V  
 (3) in forward bias the voltage across R is 2V  
 (4) in reverse bias the voltage across R is 2V.

Scan or tap for the full solution



**Q.19** The current in the circuit will be

[AIPMT 2001]



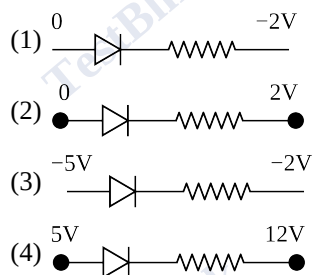
- (1)  $\frac{5}{40}$  A    (2)  $\frac{5}{50}$  A    (3)  $\frac{5}{10}$  A    (4)  $\frac{5}{20}$  A

Scan or tap for the full solution



**Q.20** From the following diode circuits, which diode is in forward biased condition?

[AIPMT 2000]



Scan or tap for the  
full solution



### ANSWER KEY

| Ques. | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 |
|-------|----|----|----|----|----|----|----|----|----|----|----|
| Ans.  | 2  | 4  | 1  | 4  | 4  | 4  | 1  | 3  | 4  | 3  | 4  |
| Ques. | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |    |    |
| Ans.  | 3  | 4  | 4  | 3  | 2  | 1  | 1  | 2  | 1  |    |    |