SEMI CONDUCTOR DEVICES

SYNOPSIS:

Energy Bands I.

- Formation of bands in solids is due to the electric field infuence of the nieghbouring atoms.
- Bands can be mainly observed in solids. To certain extent in liquids and in high dense gases.
- Formation of band takes place only if the distance between the atoms is less than a particular value called typical interatomic distance.
- Valence band : The energy band indicating the different energy states of a valence electron is called valence band.
- Conduction band : The energy band indicating different energy levels possessed by a free electron which can be used for conduction is called conduction band.
- Energy of an electron in conduction band is greater than that in valence band.
- Energy gap between valence band and conduction band is called forbidden energy gap.
- A solid consists of atoms, ions or molecules packed together closely and their proximity (nearness) is responsible for characteristic properties of this state of matter.

Solid state physics is that branch of physics which deals with the nature and properties of matter present in solid state.

- Solids can be classified into two categories a) Crystalline solids b) Amorphous solids
- In crystalline solids atoms are packed very closely and they have periodicity.
- Crystalline solids have particlular geometric shape.
- In amorphous solids atoms are packed irregularly i.e., they have no periodicity.
- Crystalline solids are anisotropic.
- Amorphous solids are isotropic.
- Basing on the forbidden energy gap present in solids, they can be classified into three types. They are
 - a) Insulators





tion band and that of holes in valence band is called Fermi Energy Level. It is mid way between valance band and conduction band.

d) Holes (+ve charge) also take part in electrical conduction like free electrons.

e) The ratio of free electrons to holes is 1 : 1 and even with increase of temperature the ratio remains same i.e., 1:1.

Extrinsic semi-condcutors:

a) "The process of adding impurities to pure Ge

•

•

or Si in controlled manner i e very small	
α_{uantites} (1 for 10 ⁷) is called doping "	
b) When a small quantity of impurity is added	
to an intrinsic semi conductor we get an extrinsic	
semi conductor.	
c) Extrinsic semi conductors are of two types:	
(i) n-type and (ii) n-type	
n-type Semi conductor.	
a) Since excess of negatively charged electrons	
are present, it is called n(negative) type.	
b) n-type is obtained by introducing (adding) a	
pentavalent impurity, i.e., a V group element like	
Phosphorous, Arsenic, Antimony in very small	
quantities to pure Ge or Si.	
c) In this the majority charge carries are elec-	
trons.	
d) In this the minority charge carries are holes.	
e) In n-type the fermi energy levels lies nearer	
to the conduction band.	
f) Since pentavalent impurity atom donates an	
electron, it is called donor impurity.	
p-type semi conductor:	
a) Since excess of positively charged holes are	
present it is called p (positive) type.	
b) p-type is obtained by introducing (adding) a	
trivalent impurity. i.e., a III group element like	
Aluminium, Indium or Gallium in very small quan-	
tities to pure Ge or Si.	
c) In this the majority charge carries are holes.	
d) In this the minority charge carriers are elec-	
trons.	
e) In p-type, the fermi energy level lies nearer to	
the valence band.	
f) Since trivalent impurity atom accepts an elec-	
tron, it is called acceptor impurity.	
g) Both p-type and n-type semiconductors are	
electrically neutral.	
p-n Junction diode:	
a) In a single Ge or Si crystal by doping one	
part with trivalent impurity and the other part with	
pentavalent impurity, a P - N junction is formed.	
b) The small region around the junction where	
holes and electrons neutralise to form a neutral	
region is called depletion region or depletion layer.	
c) The potential difference developed across the	
depletion layer is called potential barrier. The for-	
mation of potential barrier prevents the further	

diffusion of charge carriers across the junction. d) The thickness of the depletion layer is in the

order of micron (10^{-6}m) .

e) Potential barrier is 0.2 to 0.3V in Ge and 0.6

to 0.7V in Si.

f) The value of potential barrier depends on the nature of the crystal, its temperature and the amount of doping.

p-n Junction in Forward Bias Position:



a) "That external source of e.m.f which is responsible for the migration of charge carriers across the junction into opposite regions is called Forward Bias".

b) Connecting the p-type of a p-n junction to the positive and n-type to the negative terminal of a battery is called Forward Bias. In general, when the potential of the p-type is greater than the potential of the n-type by atleast barrier potential, then the diode is in forward bias.

c) The p-n junction conducts in forward bias position in forward direction.

d) The width and the resistance of junction decreases in forward bias or the junction offers low resistance in forward bias position.

e) For an ideal diode resistance in forward bias is zero.

f) If applied voltage exceeds barrier potential, the major current carriers diffuse through the junction and constitue an electric current called diffusion current.

• p-n Junction in Reverse Bias Position:





a) Connecting the p-type of a p-n junction to the -ve terminal and the n-type to the positive terminal of a battery is called reverse bias arrangement.

In general, when the potential of the p-type is smaller than potential of n-type, then the diode is in reverse bias.

b) The p-n junction does not conduct appreciable current in reverse bias position.

A current of the order of μ A in case of Ge and of the order of nA in case of Si due to minority charge carriers. This current is called reverse saturation current.

c) The width and resistance of the junction increases in this process. It offers high resistance.d) For an ideal diode, resistance in reverse bias is infinity.

e) If the applied voltage in the reverse bias exceeds knee voltage, the covelant bonds in the diode breaks and thus drifting of charge carriers takes place through the junction, the current thus constituted is called drift current

Uses of a Semi conductor diode:

A semi conductor diode is used as a (1) Rectifier (2) Detector and also as

(3)An electronic switch

Rectification & Rectifier:

a) The process of conversion of Alternating Current (ac) to Direct Current (dc) is called rectification.

b) For fullwave rectification we need atleast two semicondcutor diodes.

c) The output dc from a full wave rectifier is not smooth and steady, due to a small fraction of ac component (ripple) present in it.

d) The out put dc from a full wave rectifier is made smooth and steady by using a filter circuit.e) The function of a filter circuit is to eliminate the ripple present in dc output.

f) In half wave rectifier the efficienty is

 $\eta = 0.406 \frac{R_L}{r_f + R_L}$ It's maximum value is 40.6%.

g) In full wave rectifier the effeciency is

$$\eta = 0.812 \frac{R_L}{r_f + R_L}$$
. It's maximum value is 81.2%

(where $r_f \rightarrow$ forward resistance of diode and

 $R_L \rightarrow \text{load resistance.})$

h) In half wave rectifier the ripple frequency is same as that of the input frequency.

i) In full wave rectifier the ripple frequency is double that of the input frequency.



Full wave rectifier

a) Avalanche Break Down and Zener Break Down:

At high reverse bias voltage, a p-n junction gives an unexpected rise of current, as a result of which the device becomes heated and finally damaged. This is due to

1. Avalanche Break Down: At high reverse bias voltages, the minority charge carriers acquire high velocity and diffuse across the depletion layer, breaking down the covalent linkages between different atoms. The free electrons liberated further are responsible for breakage of other covalent bonds. Thus there is an unexpected rise (multiplication) of electrons and hence current. This high current produces heat and the device is damaged. It takes place in a lightly doped diode.

2. Zener Break Down: At high reverse bias voltages, there is the direct breakage of covalent bonds due to very strong electric field which gives rise to unexpected increase in electron number, current value and hence heat energy. It take place in a heavily doped diode.

• b). Zener Diode: A zener diode is a reverse biased heavily doped silicon (or gemanium) p-n junction diode, which is operated in the break down region. The symbol of a zener diode is shown in figure.

i) Zener diodes are used for voltage regulation.

ii) Zener diode is used as a voltage regulator. It's circuit diagram is

1)
$$I = I_{z} + I_{L}$$

2)
$$Vin = IR + V_{z}$$

3)
$$V = V = I_{x}$$





TRANSISTORS:

a) Transistors are current operated solid-state devices.

b) Silicon is the element from which most of the transistors and other semiconductor components are made today.

c) Transistor was invented by John Bardeen, William Shockley and Brattain.

d) Transistor is a three layer semicondcutor device and it is equivalent to a triode valve.

e) Transistor has two p-n junction diodes.

f) In a transistor either a p-type or an n-type semiconductor is sandwiched between a pair of opposite type of semi condcutor layers and two p-n junctions are formed.

g) Transistor has three regions known as the emitter (E), base (B) and collector (C).

- h) Emitter is heavily doped.
- i) Base of a transistor is lightly doped.

i) Collector of a transistor is moderately doped.

k) Among the three portions of a transistor maximum thickness is for collector and minimum for base.

1) Transistor has two junctions

i) emitter-base junction

ii) Collector-base junction.

m) In a transistor the emitter base junction is forward biased and the collector base junction is reverse biased. n) The main function of transistor is amplification of a small ac signal.

o) Transistor can be used in different configurations

- 1) CB configuration 2) CE configuration.
- 3) CC configuration.

p) Most commonly used transistor configuration is CE.

q) Transistor are also used as oscillators, switchs and amplifiers.

In an n-p-n Transistor:



a) The current is due to electrons and they are the majority charge carriers

b) The conventional current flows from base to emitter.

c) The emitter curret (I_E) is the sum of base curret (I_R) and collector current (I_C), $I_E = I_B + I_C$

d) I_c is 97 to 98% of I_E and I_B is 2 to 3% of I_E . In a p-n-p Transistor:



a) The current is due to holes and they are the majority charge carriers.

b) The conventional current is from emitter to base.

c) The emitter junction is forward biased and the collector junction is reverse biased.

d) Here also $I_E = I_C + I_B$

e) The collector current is less than the emitter current ($I_C < I_F$)

a) The emitter is the source of the charge carriers in a transistor. The collector receives (collects) most of the charge carriers. The base controls the collector current.

b) The current flow inside a transistor is carried out by the majority-charge carriers, which are free electrons in n-p-n transistor and holes in p-n-p transistor.

c) There are also minority carriers. The small minority-carrier current in the collector-base junction with the emitter open is called leakage current of I_{CB} .

d) Because of a high input impedance (resistance) and a high current gain, the common emitter ampli-

SR. PHYSICS

fier is mostly used.



configuration $\alpha = \left(\frac{\Delta I_C}{\Delta I_C}\right)$ f) Current amplification factor of common emitter configuration $\beta = \left(\frac{\Delta I_C}{\Delta I_F}\right)_{V}$. g) Values of α range from 0.95 to 0.99. h) Values of β range from 20 to 500.

i) α and β of a transistor is related as

$$\frac{1}{\alpha} = \frac{1}{\beta} + 1$$

$$\beta = \frac{\alpha}{1-\alpha}; \ \alpha = \frac{\beta}{1+\beta}$$

j) Input resistance of transistor in CE configu-

ration is
$$R_{in} = \left(\frac{\Delta V_{BE}}{\Delta I_B}\right)_{V_C}$$

k) Output resistance of transistor in CE configu-

ration is $R_{out} = \left(\frac{\Delta V_{CE}}{\Delta I_C}\right)_{I}$

1) Voltage gain = current gain x resistance gain.

m) Power gain =
$$\left(\frac{\Delta I_C}{\Delta I_B}\right)^2 \times \frac{R_{out}}{R_{in}} = \beta^2 \times \text{resistors on a spin}$$

tance gain.

Input characterestics



characteristics

The output voltage V_{ce} is fixed (say at zero

volts). The input voltage V_{be} is changed in

steps (say 0.1V) upto 1 volt and the corresponding base current I_b is noted down. This process is repeated for different values (say 10V, 20V etc.) of V_{ce} .

Output characterestics



1) Saturation :- In this region the collector current becomes almost independent of the base current. This happens when both junctionis are forward biased.

2) Cut off region: - In this region the collector curent is almot zero. Thin happens when both the junctionis are reverse biased.

3) Active region: - In this region collector

current (I_c) is many times greater than base

current (I_h) . A small change in input current

 (ΔI_b) produces a large change in the output

current (ΔI_c) . This happens when emitter junction is forward b.iased and collector junction is reverse biased. The transistor works as an amplifier when operated in the active region.

Hybrid or 'h' parameters of transistor:



1) Input impedance, (**h**_{in}):

$$h_{re} = \left(\frac{\Delta V_{be}}{\Delta V_{ce}}\right)_{I_b}$$
 constant.

Unit for h_{ie} is Ohm (same as resistance) 2) Reverse voltage ratio, (**h**_{re})

$$h_{re} = \left(\frac{\Delta V_{be}}{\Delta I_{ce}}\right)_{I_b}$$
 constant.

SR. PHYSICS

It is a dimensionless constant. 3) Forward current ratio, (\mathbf{h}_{t_0})

$$h_{fe} = \left(\frac{\Delta I_c}{\Delta I_b}\right)_{V_{ce}}$$
 constant

It is a dimensionless constant.

4) Output admittance, (h_{oe})

$$h_{oe} = \left[\frac{\Delta I_C}{\Delta V_{CE}}\right]_{I_b}$$

Unit for (h_{oe}) is siemen.

- 1) In put characterstics are drawn between V_{BE} verses I_{B} at constant V_{CE}
 - 2) Out put characteristics are drawn between V_{CE} verses I_{C} at constant I_{B}
- Advantages of a semi conductor device over vaccum tube device:

a) Filaments are not required in a transistor, where as it is a must in a vaccum tube triode.

b) Very low operating voltages (0-8V) are required for a transistor, where as very high operating voltages are required for vaccum tube triode (0-300V)

c) Creation of vaccum is not necessary in a transistor where as it a must in a vaccum tube triode.d) A transistor is more compact, economical and has a long life when compared to a vaccum tube triode.

CONCEPTUAL QUESTIONS

- An electrically neutral semi conductor has

 equal amounts of negative and positive charges
 no minority charge carriers
 - 3) no majority charge carriers

4) no free charges

- The potential barrier at PN junction is due to
 1) fixed acceptor and donor ions on either side of the junction
 - 2) minority carriers on either side of the junction
 - 3) majority carriers on either side of the junction4) both majority and minority carriers on either side of junction
- The reverse saturation current in a PN junction diode is due to only the
 - 1) minority carriers 2) majority carriers
 - 3) acceptor ions 4) donor ions
- 4. A PN junction diode cannot be used
 - 1) as rectifier 2) for converting light energy t
 - 2) for converting light energy to electric energy
 - 3) for getting light radiation
 - 4) for increasing the amplitude of an ac signal.

5. A full wave rectifier along with the output is shown in fig. the contributions from the diode (1) are



SR. PHYSICS

12.	The mobility of free electrons is greater than that	24.	Transistors are made of
	of free holes because		1) insulators 2) conductors
	1) they carry negative charge		3) alloys 4) doped semi-condcutors
	2) they are light	25.	The depletion region is
	3) their mutal collisions are less		1) region of opposite charges
	4) they require low energy to continue their motion		2) neutral region
13.	A semiconductor at 0K behaves as		3) Region of infinite energy
	1) conductor 2) insulator		4) Region of free current carriers
	3) super condcutor	26.	p-n junction diode acts as
	4) extrensive semiconductor		1) ohmic resistance
14.	The valency of impurity element for making n-		2) non-ohmic resistance
	type semiconductor is		3) Both 1 and 2 4) None
	1) 3 2) 5 3) 4 4) 7	27.	The process of converting alternating current into
15.	The valency of impurity element for making p-		direct current is known as
	type semiconductor is		1) modulation 2) amplification
	1) 5 2) 4 3) 3 4) 7		3) detection 4) rectification
16.	In n-type semiconductors the electron concen-	28.	In n-p-n transistor the arrow head on emitter rep-
	tration is equal to		resents that the conventional current flows from
	1) density of donor atoms		1) base to emitter 2) emitter to base
	2) density of acceptor atoms		3) emitter to collector 4) base to collector
	3) density of both type of atoms	29.	On increasing reverse voltage in a p-n junction
	4) neither density of acceptor atoms nor density		diode the value of reverse current will
	of donor atoms		1) gradually increase
17.	In n-type, semiconductor, the Fermi, energy level		2) first remains constant and then suddenly increase
	is present		3) remain constant 4) gradually decrease
	1) just below the valence band	30.	In forward bias the depletion layer behaves like
	2) just below the conduction band		1) an insulator 2) a conductor
	3) just above the valence band		3) a semiconductor 4) capacitor
	4) in the middle of valence and conduction bands	31.	In a junction transistor the emitter, base and col-
18.	The hole in a p-type semi conductor is		lector are made of
	1) an electron deficiency 2) an electron excess		1) extrinsic semi conductors
10	3) an atom deficiency 4) positive ion		2) intrinsic semi conductors
19.	p-type semi conductor is		3) both 1 and 2 4) metal
	1) negatively charged 2) positively charged	32.	p-n junction in reverse bias behave like
	3) neutral		1) an inductor 2) a condenser
20	4) may be positive or negative	22	3) a rectifier 4) an off switch
20.	n-type semi conductor is	33.	The main cause of avalenche breakdown is
	1) negatively charged 2) positively charged		1) collision by ionisation 2) high doping
	$\frac{3}{1} = \frac{1}{1}$		3) recombination of electrons and holes
21	4) may be positive or negative The right frequency in the input of full wave rec	24	4) low doping The main assure of Zener husely deven is
21.	tif any and the set 50 La and any set 10 La	54.	1) the have consider ductor heirs corrections
	ther working at 50Hz ac source will $1 \times 50 \text{Hz}$ $2 \times 100 \text{Hz}$ $2 \times 200 \text{Hz}$ $4 \times 25 \text{Hz}$		1) the base semiconductor being germanium 2) production of clostron, hole point due to ther
22	1) 50 HZ 2) 100 HZ 3) 200 HZ 4) 25 HZ The thickness of deplection leaven is compositentally		2) production of electron - note pairs due to ther-
22.	1) 1 $(m = 2)$ 1 mm $(m = 2)$ 1 mm $(m = 4)$ 1 mm		2) low doning (1) high doning
	1) 1 μ m 2) mm 3) 1 cm 4) m	25	In a transistor
23.	The correct relation between current gains α and β is	55.	1) both emitter and the collector are equally
	$\alpha \alpha \alpha \alpha \alpha$		doned
	1) $p = \frac{1-\alpha}{1-\alpha}$ 2) $p = \frac{1+\alpha}{1+\alpha}$		2) Base is more heavily doned that then collector
			3) Collector is more heavily doped that the motter
	3) $\beta = \alpha(1-\alpha)$ 4) $\beta = \frac{1-\alpha}{\alpha}$		4) the base is made very thin and is lightly doped
	α		

 1) length of emitter is greater than that of collector to a greater length 2) length of collector is greater than that of emitter if is all collector is greater length 3) both emitter and collector current 2) slightly less than the collector current 3) slightly less than the collector current 3) equal to the collector current 4) equal to the collector current 3) equal to the collector current 4) equal to the collector current 3) equal to the collector current 4) equal to the collector base junction is forward biased 2) the emitter - base junction is forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junction is reverse biased in app 2) the emitter junction is reverse biased in app 2) the emitter junction is reverse biased in app 2) the emitter junction is reverse biased in app 2) the emitter junction is reverse biased in app 3) the mitter junction is reverse biased in app 3) the emitter junction is reverse biased in app 2) the emitter junction is reverse biased in app 3) the emitter junction is reverse biased in app 3) the emitter junction is reverse biased in app 3) the emitter junction is reverse biased in app 3) the emitter junction is reverse biased in app 3) the emitter junction is reverse biased in app 3) the emitter junction is reverse biased in app 3) the emitter junction is reverse biased in the pap pad lectrons into the base region of the pup. 3) the emitter junction is reverse biased in app 4) the collector rements 3) collision generated charge carriers 3) collision generated charge carriers <li< th=""><th>36.</th><th>In a transistor</th><th>44.</th><th>When the condcutivity of a semi conductor is</th></li<>	36.	In a transistor	44.	When the condcutivity of a semi conductor is
tor 2) length of collector is greater than that of emit- ter 3) both emitter and collector can have greater length 37. In-transistor the emitter current is 3) signity less than the collector current 3) equal to the base current 4) equal to the base current 4) equal to the collector current 4) equal to the collector current 3) equal to the collector current 4) equal to the collector current 3) equal to the collector current 4) equal to the collector current 3) the emitter - base junction is reverse biased and the collector base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junction is reverse biased 30. one way in which the operation of an npn transistor as precifier 3) chose stater [1] the emitter junction is reverse biased in ppi 2) the emitter junction is reverse biased in ppi 2) the emitter junction is reverse biased in ppi 2) the emitter junction is reverse biased in ppi 3) the emitter junction is reverse biased in ppi 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) φ times I_{a} $(2) \beta$ times I_{c} 3) α times I_{a} $(2) \alpha$ times I_{c} $(2) \frac{3V}{4} = \frac{\delta V}{4}$ 50. A zener diode 11. In case of common emitter p-n-p transistor imput tharacteristic is a graph drawn 1) With I_{c} on y-axis I_{c} on x-axis keeping V_{cr} 3) with I_{c} on y-axis and V_{cr} x-axis keeping I_{c} 3) with I_{c} on y-axis and V_{cr} x-axis keeping I_{c} 3) with I_{v} on y-axis and V_{cr} x-axis keeping I_{c} 3) with I_{v} on y-axis and V_{cr} x-axis keeping I_{cr}		1) length of emitter is greater than that of collec-		only due to breaking of covalent bonds, the semi
2) length of collector is greater than that of emitter arrest is greater than that of emitter is 3) both emitter and collector have same length 4) any one of emitter and collector can have greater length 5. In the use of transistor the collector current 2) slightly less than the collector current 4) equal to the base current 5 a) equal to the collector current 4) equal to the base current 5 and and the collector base junction is reverse biased in app transistor is that 1) the emitter junction is reverse biased in app transistors are prefired to pup transistors because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence bigh mobility of energy 41. A transistor anglifier a weak current signal because current is 1) $\beta \tau$ times I,		tor		condcutor is called
 ter ter<td></td><td>2) length of collector is greater than that of emit-</td><th></th><td>1) n-type 2) p-type</td>		2) length of collector is greater than that of emit-		1) n-type 2) p-type
 3) both emitter and collector have same length 4) any one of emitter and collector can have graater length 37. In-transistor the emitter current is 1) slightly less than the collector current 3) slightly less than the collector current 4) equal to the collector current 4) equal to the base current 4) equal to the base current 4) equal to the base current 4) equal to the collector current 4) the emitter - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions for forward biased 4) any of the two junctions is the base region of form 9 and electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal because collector current is 1) or times 1, or y-axis low end biased 4) any of times 1, or y-axis low of the spin and diffusion of charges 2) doft fifting of charges 3) both diffusion and drifting of charges 3) both affing of charges 3) both affing of charges 4) holes only 41. A transistor amplifies a weak current signal because collector current is 1) or y high 2) moderate 3) correct 42. In common collector circuit, out put resistance in the y-hy por or n-type 4) has end by any charges 2) doft fifting of charges 3) both diffusion and drifting of charges 3) both affifting of charges 3) both affifting of charges 3) both affifting of charges 4) holes only 45. A nelectric fields is applied across a emitor or the phone big mobility than holes and hence high mobility than holes and hence high mobility than holes and hence high mobility of energy 3) both diffusion of charges 2) doft fifting of charges 3) b		ter		3) intrensic 4) extrinsic
4) any one of emitter and collector can have greater length 37. In-transistor the emitter current is 37. In-transistor the emitter current is 38. In the use of transistor as an amplifier 39. Une emitter - base junction is reverse biased and the collector current 30. Label the collector current 30. Label the collector current 31. In the use of transistor as an amplifier 32. In the use of transistor as an amplifier 33. In the use of transistor as an amplifier 34. In the use of transistor as an amplifier 35. In the use of transistor as an amplifier 36. In the use of transistor as an amplifier 37. In-transistor as a numplifier 38. In the use of transistor as an amplifier 39. Done way in which the operation of an npn transistor 30. One way in which the operation of an npn transistor 31. In termiter junction in jerverse biased in npn 32. The emitter junction in pertransistor is that 31. In the mitter junction in pertransistor is that 31. In the mitter junction ingerse biased of npn 32. The emitter junction ingerse biased of npn 33. One way in which the operation of an npn transistors because they have 31. Define ar performed to pnp transistors because they have 31. Definer Ingers. The performant biased 31. Performs 12. Perform 13. 31. Perform 14. A transistor amplifiers a weak current signal be- cause collector current is 31. Performs 12. Performed 12. Performed 12. Performs 12. Performed 12. Performed 12. Performs 12. Performed 12. Performs 12. Performed 13. Performed 12. Performed 12. Performed 12. Performed 13. Performed 12. Performed 13. Perf		3) both emitter and collector have same length	45.	An electric fields is applied across a semi con-
greater lengthAs temperature increases, n will37. In-transistor the emitter current is1) slightly less than the collector current3) equal to the collector current4) equal to the collector current4) equal to the collector current3) equal to the collector current3) equal to the collector current3) equal to the sec current38. In the use of transistor as an amplifier1) the emitter - base junction is forward biasedand the collector - base junction is forward biasedand the collector - base junction is reverse biasedand the collector - base junction is forward biased4) any of the two junctions may be forward biased4) any of the two junctions may be forward biased4) any of the two junctions may be forward biased3) both the junctions are forward biased4) any of the two junctions may be forward biased3) the emitter injects holes into the base of npn4) the emitter injects holes into the base of npn4) heer ther junction energy3) capable of handling large power4) electrons have high mobility than holes and hence high mobility of energy3) a times l _h 41. A transistor amplifies1) p times l _h 2) In common collector current is1) $yry high$ 3) low41. Menspin on duffiting of charges3) both the punction is mainly due to1) diffusion of charges3) both the punction is mainly due to1) diffusion of charges3) both the sole or only4) holes only		4) any one of emitter and collector can have		ductor. Let n be the number of charge carriers.
37.In-transistor the emitter current is 1) slightly more than the collector current 3) equal to the collector current 4) equal to the collector current 1) the emitter - base junction is reverse biased and the collector - base junction is reverse biased a) the emitter - base junction is reverse biased d) the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased d) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased d) any of the two junctions may be forward biased d) any of the two junction ingets minority carriers into the base region of the pap. 3) the emitter junction ingets minority carriers into the base region of the pap. 3) the emitter junction ingets minority carriers into the base region of the pap. 3) the emitter junction ingets minority carriers a) the emitter junction ingets minority carriers (2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transitor anylifies a weak current is (1) β times I (2) In common collector current is (3) α times I (2) P times I (4) The current I (5) In case of common emitter p-transistor imput characteristic is a graph drawn (1) With I (con y-axis and V _{cox} on x-axis keeping V _{cr} constant (4) With V _w on y-axis and V _{crx} x-axis keeping I (constant (4) With V _w on y-axis and V _{crx} x-axis keeping I (constant (4) With V _w on y-axis and V _{crx} x-axis keeping I (constant (4) With V _w on y-axis and V _{crx} x-axis keeping I (constant (constant)		greater length		As temperature increases, n will
1) slightly more than the collector current 2) slightly more than the collector current 3) equal to the base current 4) equal to the base current 1) the emitter - base junction is reverse biased and the collector - base junction is reverse biased 2) the emitter - base junction is forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any be used as an eredifier 3) cannot be used as a rectifier 4) may be used as an eredifier 4) Both are reverse biased 3) P is reverse biased and Q is reverse biased 3) P is reverse biased and Q is reverse biased 4) Both are reverse biased and Q is reverse biased 4) Both are reverse biased and Q is reverse biased 3) P is reverse biased and Q is reverse biased 4) Both are reverse biased and Q is reverse biased 4) Both are reverse biased and Q is reverse biased 4) and be used as an eredifier 4) lons 50. A zener diode 1) in terminy denote 1	37	In-transistor the emitter current is		1) increase 2) decrease
46. The diffusion current in a p- junction is greater than the drift current when the junction is greater than the drift current when the junction is greater than the drift current when the junction is greater than the drift current when the junction is greater than the drift current when the junction is greater than the drift current when the junction is greater than the drift current when the junction is greater than the drift current when the junction is greater than the drift current when the junction is greater than the drift current when the junction is greater than the drift current when the junction is greater than the drift current when the junction is greater than the drift current when the junction is greater than the drift current when the junction is greater biased and the collector - base junction is reverse biased and the collector - base junction is nany transistors are preferred to pnp transistors biased in pnc high mobility than holes and hence high mobility dranegreg method hence high mobility dranegreg method hence high mobility dranegreg method hence high mobility of energy 3) low drispation and biased, the current the motion is mainly due to 1) diffusion of charges 2) drifting of charges 3) low drifts is on addrifting of charges 3) low drifts is on addrift mg of charges 3) low drifts is on addrift mg of charges 3) low drifts is on addrift mg of charges 3) low drifts of charge carriers 4) low in the drifts i		1) slightly more than the collector current		3) does not change 4) may increase or decrease
 a) a qual to the collector current b) equal to the base current c) qual to the base current f) the emitter - base junction is reverse biased and the collector - base junction is also reverse biased d) the emitter - base junction is forward biased d) the emitter - base junction is reverse biased f) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased in app g) the emitter junction is reverse biased of the pp and electrons have high mobility than holes and hence high mobility of energy g) capable of handling large power h) electron shave high mobility than holes and hence high mobility of energy g) at times l, g) at times l, g) at times l, g) poth diffusion of charges g) low diffusion of charges g) both diffusion and diffing of charges g) both diffusio		2) slightly less than the collector current	46.	The diffusion current in a p-n junction is greater
1) forward biased 2) reverse biased 3) the emitter - base junction is also reverse biased 2) the emitter - base junction is forward biased and the collector base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions is reverse biased in pri- 2) the emitter junction is reverse biased in pri- 4) the emitter injects holes into the base of the prip and electrons into the base of the prip and electrons into the base of prin- 4) the emitter injects holes into the base of the prip and electrons into the base of prin- 4) the current flow in a Zener diode is mainly due to 1) bow cost 2) low dissipation energy 3) capable of handling large power 4) electrons mave high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) very high 2) moderate 3) low 4) very low 43. When p-n junction is foward biased, the current arroos the junction is mainly due to 1) diffusion of charges 3) low 4) very low 43. When p-n junction is foward biased, the current arroos the junction is mainly due to 1) diffusion on dhifting of charges 3) low 4) With I_c on y-axis and V _{ctt} on x-axis keeping V _{ctt} constant 4) With I_c on y-axis and V _{ctt} on x-axis keeping V _{ctt} 4) With V _w on y-axis and V _{ctt} x-axis keeping I _v 4) With V _w on y-axis and V _{ctt} x-axis keeping I _v 4) With V _w on y-axis and V _{ctt} x-axis keeping I		3) equal to the collector current		than the drift current when the junction is
 38. In the use of transistor as an amplifier 1) the emitter - base junction is reverse biased and the collector base junction is forward biased and the collector - base junction is reverse biased 2) the emitter - base junction is reverse biased 3) un biased 4) both forward and reverse biased 4) both forward and reverse biased 1) may be used as a rectifier because it offers a relatively high resistance for reverse bias. 2) may be used as a rectifier because it offers a relatively high resistance for reverse bias. 3) any be used as a rectifier because it offers a relatively high resistance for reverse bias. 3) any be used as a rectifier because it offers a relatively high resistance for reverse bias. 3) any be used as a rectifier because it offers a relatively high resistance for reverse bias. 3) any be used as a rectifier because it offers a relatively high resistance for reverse bias. 3) any be used as a rectifier because it offers a relatively high resistance for reverse bias. 3) any be used as a rectifier because it offers a relatively high resistance for reverse bias. 3) anot be used as a rectifier because it offers a relatively high resistance for reverse bias. 3) cannot be used as a rectifier because it offers a relatively high resistance for reverse bias. 3) cannot be used as a rectifier because it offers a reverse biased and a reverse biased and are reverse biased and are reverse biased. 4) may be used as a rectifier because it offers a relatively high resistance for reverse bias. 3) cannot be used as a rectifier because it offers a relatively high resistance for reverse bias. 3) cannot be used as a rectifier because it offers a reverse biased and are serverse biased and are reverse biased. 4) For urrent injects holes into the base of the pnp and interest proverset is a relatively low resistance for reverse biased.<th></th><th>4) equal to the base current</th><th></th><th>1) forward biased 2) reverse biased</th>		4) equal to the base current		1) forward biased 2) reverse biased
 a) The use of utability of the spin sectors biased and the collector base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction of an npn transistor is reverse biased in npn 2) the emitter junction is reverse biased in npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility of nergy 4. It is that there high mobility of energy 4. It is that there high mobility of the sector current is 1) β times I_n 2) β times I_n constant 4. So the sector current is 1) for times I_n 2) g times I_n constant 4. So the sector current is 1) diffusion of charges 2) diffing of charges 3) both diffusion and drifting of charges 3) both diffusion and drifting of charges 4. To the sector of the sector on the sector on the base of the proper on-type 4. To the sector distent 4. To ensure the sector and biased 4. To the sector and t	28	4) equal to the base current		3) un biased
 47. Germanium diode 17. In the collector base junction is reverse biased and the collector base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the collector - base junction is reverse biased and the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junction is more forward biased 4) any of the two junction is more forward biased 4) any of the two junction is more forward biased 4) any of the two junction is is to the base of the pnp and electrons into the base region of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base region of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base region of npn 4) for signal because they have 1) low cost 1) of wissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 3) is ether p-type or n-type 4) has no P-N junction 4) (or y-axis and V_{ce} on x-axis keeping V_{ce} constant 4) with V_w on y-axis and V_{ce} x-axis keepin	50.	1) the amitter base innation is reverse biased		4) both forward and reverse biased
and the collector base junction is also reverse biased 2) the emitter - base junction is forward biased and the collector - base junction is reverse biased 3) both the junctions are forward biased 4) any of the two junctions may be forward bi- ased. 3) Cone way in which the operation of an npn tran- sistor differ from that of a pap transistor is that 1) the emitter junction is reverse biased in npn 2) the emitter injects holes into the base of the pnp and electrons into the base region of npn 4) the emitter injects holes into the base of npn 40. npn transistors are preferred to pnp transistors because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) β times I _b 2) β times I _b 3) α times I _b 42. In common collector circuit, out put resistance is 1) very high 3) low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 3) both diffusion and drifting of charges 4) holes only 4) With I _c on y-axis I _b on x-axis keeping V _{CE} constant 4) With V _b on y-axis and V _{CE} x-axis keeping V _{CE} constant 4) With V _b on y-axis and V _{CE} x-axis keeping I _b		1) the emitter - base junction is reverse blased	47.	Germanium diode
 biased 2) the emitter - base junction is forward biased and the collector - base junction is reverse biased as and the collector - base junction is reverse biased as a contifier because it offers a relatively high resistance for forward bias and very high resistance for reverse bias. 3) com transistor amplifier 48. Terminal potentials of two diodes P and Q are shown in figure. Then which of the following is correct 40. In primer injects holes into the base of fup np and electrons into the base of np np any transistors and prime size of the physe of the physe		and the collector base junction is also reverse		1) may be used as rectifier because it offers a
2) the emitter - base junction is forward biased and the collector - base junction is reverse bi- ased 3) both the junctions may be forward bi- ased. 3) Cone way in which the operation of an ppt transistor istor differ from that of a ppt transistor is that 1) the emitter junction is reverse biased in npp 2) the emitter junction is reverse biased in npp 2) the emitter junction is reverse biased in npp 2) the emitter junction is reverse biased in npp 3) the emitter injects holes into the base of the pnp and electrons into the base region of ppn 4) the emitter injects holes into the base of the pnp and electrons into the base region of ppn 40. npn transistors are preferred to ppt transistors because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) β times I _b 2) β times I _c 3) α times I _b 4) α times I _c 3) α times I _b 2) β times I _c 3) low 4) very low 43. When p-n junction is forward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 4) holes only				relatively low resistance for forward bias and
and the collector - base junction is reverse biased ased 3) both the junctions are forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased ased. 3) One way in which the operation of an np tran- sistor differ from that of a pnp transistor is that 1) the emitter junction injects minority carriers into the base region of the pnp. 3) the emitter injects holes into the base of the pnp and electrons into the base region of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) but contrastors are preferred to pnp transistors because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electron shave high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) β times I_{b} 2) β times I_{c} 3) α times I_{b} 2) β times I_{c} 42. In common collector circuit, out put resistance is 1) β times I_{b} 2) β times I_{c} 3) both diffusion of charges 3) both diffusion and drifting of charges 3) both diffusion and drifting of charges 4) holes only		2) the emitter - base junction is forward biased		very high resistance for reverse bias.
ased 3) both the junctions are forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 4) any of the two junctions may be forward biased 3) control to used as a rectifier 4) may be used as an amplifier 4) may be used as an amplifier 4) may be used as an amplifier 4) may be used as an amplifier 4. Terminal potentials of two diodes P and Q are shown in figure. Then which of the following is correct 5) the emitter injects holes into the base of the pp pand electrons into the base region of npn 40. npn transistors are preferred to pnp transistors because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) $β$ times I _b 42. In common collector circuit, out put resistance is 1) $very high$ 2) $β$ times I _c 42. In common collector circuit, out put resistance is 1) $very high$ 2) $β$ times I _c 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 3) both diffusion and drifting of charges 4) holes only 4) With I _c on y-axis I _b on x-axis keeping V _{ce} constant 4) With V _{be} on y-axis and V _{ce} x-axis keeping V _{ce} constant 4) With V _{be} on y-axis and V _{ce} x-axis keeping I _b		and the collector - base junction is reverse bi-		2) may be used as a rectifier because it offers a
 3) both the junctions are forward biased 4) any of the two junctions may be forward biased 3) control the work in the object of the properiod of the		ased		relatively high resistance for forward bias and very
 4) any of the two junctions may be forward biased. 39. One way in which the operation of an npn transistor differ from that of a pup transistor is that 1) the emitter junction in jects minority carriers into the base region of the pup. 3) the emitter junction injects minority carriers into the base region of the pup. 3) the emitter injects holes into the base of the pup and electrons into the base of npn 4) the emitter injects holes into the base of npn and electrons into the base of npn and electrons into the base of npn 40. npn transistors are preferred to pup transistors because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal because collector current is 1) \varphigh 2) moderate 3) \varphi times I_c 41. A transistor amplifies a weak current signal because collector circuit, out put resistance is 1) very high 2) moderate 3) low 4) very low 43. When p-n junction is foward biased, the current across the junction is from the diaged, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 4) holes only 		3) both the junctions are forward biased		low resistance for reverse bias.
ased. 39. One way in which the operation of an pp transistor is that 1) the emitter junction is reverse biased in pp 2) the emitter junction injects minority carriers into the base region of the pp. 3) the emitter injects holes into the base of the pp and electrons into the base region of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) β times I _b 2) β times I _c 3) α times I _b 4) β times I _c 3) α times I _b 4) β times I _c 3) α times I _b 4) α times I _c 3) α times I _b 4) α times I _c 3) β times I _c 3) β times I _c 3) β times I _c 4) holes only 4) With I _c on y-axis I _h on x-axis keeping V _c constant 4) With I _c on y-axis I _h on x-axis keeping V _c constant 4) With I _c on y-axis and V _c x-axis keeping I _h		4) any of the two junctions may be forward bi-		3) cannot be used as a rectifier
 39. One way in which the operation of an npn transistor differ from that of a pnp transistor is that 1) the emitter junction injects minority carriers into the base region of the pnp. 3) the emitter junction injects minority carriers into the base region of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 40. npr transistors are preferred to pnp transistors because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal because collector current is 1) β times I_b 2) β times I_c 3) α times I_b 4) α times I_c 3) (α times I_b 4) α times I_c 42. In common collector circuit, out put resistance is 1) very high 2) moderate 3) low 4) very low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 3) both diffusion and drifting of charges 4) holes only 43. When p-n sunction is mainly due to 1) diffusion and drifting of charges 3) both diffusion and drifting of charges 4) holes only 		ased.		4) may be used as an amplifier
sistor differ from that of a pnp transistor is that 1) the emitter junction is reverse biased in npn 2) the emitter junction injects minority carriers into the base region of the pnp. 3) the emitter injects holes into the base of the pnp and electrons into the base region of npn 4) the emitter injects holes into the base of npn 40. npn transistors are preferred to pnp transistors because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) β times I _b 2) β times I _c 3) α times I _b 42. In common collector circuit, out put resistance is 1) very high 2) moderate 3) low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 3) both diffusion and drifting of charges 4) holes only	39.	One way in which the operation of an npn tran-	48.	Terminal potentials of two diodes P and Q are
1) the emitter junction is reverse biased in npn 2) the emitter junction injects minority carriers into the base region of the pnp. 3) the emitter injects holes into the base of the pnp and electrons into the base region of npn 4) the emitter injects holes into the base of npn 40. npn transistors are preferred to pnp transistors because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) β times I _b 2) β times I _c 3) α times I _b 42. In common collector circuit, out put resistance is 1) very high 2) moderate 3) low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 3) both diffusion and drifting of charges 4) holes only		sistor differ from that of a pnp transistor is that		shown in figure. Then which of the following is
 2) the emitter junction injects minority carriers into the base region of the pnp. 3) the emitter injects holes into the base of the pnp and electrons into the base region of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 40. npn transistors are preferred to pnp transistors because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal because collector current is 1) \$\varphi\$ times I_b 2) \$\varphi\$ times I_c 42. In common collector circuit, out put resistance is 1) very high 2) moderate 3) low 4) very low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 2) drifting of charges 3) both diffusion and drifting of charges 4) holes only 43. When p-n junction is mainly due to 1) diffusion and drifting of charges 4) holes only 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion and drifting of charges 3) both diffusion and drifting of charges 4) holes only 		1) the emitter junction is reverse biased in npn		correct
into the base region of the pnp. 3) the emitter injects holes into the base of the pnp and electrons into the base region of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 40. npn transistors are preferred to pnp transistors because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) β times I _b 2) β times I _b 42. In common collector circuit, output resistance is 1) very high 2) moderate 3) low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 4) holes only (P) $A = A = Q = A = Q = A = Q = A = A = Q = A = A$		2) the emitter junction injects minority carriers		-5V
3) the emitter injects holes into the base of the pnp and electrons into the base region of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) tow cost 2) low dissipation energy 3) could be a transistor amplifies a weak current signal because collector current is 1) very high 2) β times I _c 3) α times I _b 4) α times I _c 42. In common collector circuit, out put resistance is 1) very high 2) moderate 3) low 4) very low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 2) drifting of charges 3) both diffusion and drifting of charges 4) holes only A_{c} the size of the interval biased is mainly due to 2) drifting of charges 3) both diffusion and drifting of charges 3) both diffusion and drifting of charges 4) holes only A_{c} the size of t		into the base region of the pnp.	(P)	
pnp and electrons into the base region of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) the emitter injects holes into the base of npn 4) both are forward biased. 4) Disting enerated charge carriers 3) is either p-type or n-type 4) has no P-N junction 51. In case of common emitter p-n-p transistor in- put characteristic is a graph drawn 1) With I _c on y-axis Meeping V _{cE} constant 4) With I _c on y-axis I _B on x-axis keeping V _{cE} constant 4) With V _{br} on y-axis and V _{cE} x-axis keeping I _B		3) the emitter injects holes into the base of the		1) Both are reverse biased
4) the emitter injects holes into the base of npn 40. npn transistors are preferred to pnp transistors because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) β times I _b 2) β times I _c 3) α times I _b 42. In common collector circuit, out put resistance is 1) very high 2) moderate 3) low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 3) both diffusion and drifting of charges 4) holes only		pnp and electrons into the base region of npn		2) P is forward biased and Ω is reverse biased
40. npn transistors are preferred to pnp transistors because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) β times I _b 2) β times I _c 3) α times I _b 42. In common collector circuit, out put resistance is 1) very high 2) moderate 3) low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 3) both diffusion and drifting of charges 4) holes only		4) the emitter injects holes into the base of npn		3) P is reverse biased and Q is forward biased
because they have 1) low cost 2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) β times I_b 2) β times I_c 3) α times I_b 4) α times I_c 42. In common collector circuit, out put resistance is 1) very high 2) moderate 3) low 4) very low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 2) drifting of charges 3) both diffusion and drifting of charges 4) holes only	40.	npn transistors are preferred to pnp transistors		4) Both are forward biased
1) low cost1) low cost2) low dissipation energy3) capable of handling large power4) electrons have high mobility than holes and hence high mobility of energy1) thermally generated charge carriers4) electrons have high mobility than holes and hence high mobility of energy3) collision generated charge carriers41. A transistor amplifies a weak current signal be- cause collector current is3) α times I b2) β times Ic c3) α times I b2) β times Ic c3) is either p-type or n-type42. In common collector circuit, out put resistance is 1) very high 3) low2) moderate 4) has no P-N junction3) low4) very low43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 4) holes only51. In case of common emitter p-n-p transistor in- put characteristic is a graph drawn 1) With Ic on y-axis and V cE on x-axis keeping V cE constant 3) With Ic on y-axis IB on y-axis and V cE x-axis keeping V cE		because they have	49	The current flow in a Zener diode is mainly due to
2) low dissipation energy 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal be- cause collector current is 1) β times I _b 2) β times I _c 3) α times I _b 42. In common collector circuit, out put resistance is 1) very high 2) moderate 3) low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 4) holes only 2) minority charge carriers 3) collision generated charge carriers 4) ions 50. A zener diode 1) is a lightly doped junction diode 3) is either p-type or n-type 4) has no P-N junction 51. In case of common emitter p-n-p transistor in- put characteristic is a graph drawn 1) With I _c on y-axis and V _{CE} on x-axis keeping V _{CE} constant 3) With I _c on y-axis I _B on x-axis keeping V _{CE} constant 4) With V _{be} on y-axis and V _{CE} x-axis keeping I _B		1) low cost		1) thermally generated charge carriers
 3) capable of handling large power 3) capable of handling large power 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal because collector current is 1) β times I_b 2) β times I_c 3) α times I_b 2) β times I_c 3) α times I_b 4) α times I_c 42. In common collector circuit, out put resistance is 1) very high 2) moderate 3) low 4) very low 43. When p-n junction is foward biased, the current across the junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 3) both diffusion and drifting of charges 4) holes only 		2) low dissipation energy		2) minority charge carriers
 4) electrons have high mobility than holes and hence high mobility of energy 41. A transistor amplifies a weak current signal because collector current is β times I_b β times I_b β times I_b β times I_c β times I_b β times I_b β times I_b β times I_c β times I_b β times I_b β times I_c β times I_b β times I_b β times I_c has no P-N junction 50. A zener diode is a lightly doped junction diode has no P-N junction 51. In case of common emitter p-n-p transistor input characteristic is a graph drawn When p-n junction is foward biased, the current across the junction is mainly due to diffusion of charges both diffusion and drifting of charges With I_c on y-axis I_B on x-axis keeping V_{CE} constant With V_{be} on y-axis and V_{CE} x-axis keeping I_B 		3) capable of handling large power		3) collision generated charge carriers
 hence high mobility of energy 41. A transistor amplifies a weak current signal because collector current is β times I_b β times I_b β times I_c β times I_c β times I_c β times I_c β times I_b β times I_c 9 moderate 9 with I_c on y-axis V_{BE} on x-axis keeping V_{CE} constant 9 with I_c on y-axis I_B on x-axis keeping V_{CE} constant 9 with V_{bc} on y-axis and V_{CE} x-axis keeping I_B 		4) electrons have high mobility than holes and		4) ions
 41. A transistor amplifies a weak current signal because collector current is β times I_b β times I_c β times I_c β times I_c β times I_c a times I_b β times I_c 42. In common collector circuit, out put resistance is very high moderate low very low 43. When p-n junction is foward biased, the current across the junction is mainly due to diffusion of charges diffusion and drifting of charges both diffusion and drifting of charges both diffusion and drifting of charges holes only 1) is a lightly doped junction diode is either p-type or n-type has no P-N junction In case of common emitter p-n-p transistor input characteristic is a graph drawn With I_c on y-axis and V_{CE} on x-axis keeping V_{CE} With I_c on y-axis I_B on x-axis keeping V_{CE} With I_c on y-axis I_B on x-axis keeping V_{CE} With V_{be} on y-axis and V_{CE} x-axis keeping I_B 		hence high mobility of energy	50.	A zener diode
cause collector current is 1) β times I_b 2) β times I_c 3) α times I_b 4) α times I_c 42. In common collector circuit, out put resistance is 1) very high 2) moderate 3) low 4) very low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 2) drifting of charges 3) both diffusion and drifting of charges 4) holes only 1) Common collector current is 1) α times I_c 2) heavily doped junction diode 3) is either p-type or n-type 4) has no P-N junction 51. In case of common emitter p-n-p transistor in- put characteristic is a graph drawn 1) With I_c on y-axis and V_{CE} on x-axis keeping V_{CE} constant 3) With I_c on y-axis I_B on x-axis keeping V_{CE} constant 4) With V_{be} on y-axis and V_{CE} x-axis keeping I_B	41.	A transistor amplifies a weak current signal be-		1) is a lightly doped junction diode
1) β times I_b 2) β times I_c 3) α times I_b 4) α times I_c 42. In common collector circuit, out put resistance is 1) very high 2) moderate 3) low 4) very low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 2) drifting of charges 3) both diffusion and drifting of charges 4) holes only 1) β times I_c 3) is either p-type or n-type 4) has no P-N junction 51. In case of common emitter p-n-p transistor in- put characteristic is a graph drawn 1) With I_c on y-axis and V_{CE} on x-axis keeping V_{CE} constant 3) With I_c on y-axis I_B on x-axis keeping V_{CE} constant 4) With V_{be} on y-axis and V_{CE} x-axis keeping I_B		cause collector current is		2) heavily doped junction diode
1) β times I_b (2) β times I_c 3) α times I_b (4) α times I_c 42. In common collector circuit, out put resistance is 1) very high (2) moderate 3) low (4) very low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges (2) drifting of charges 3) both diffusion and drifting of charges (4) has no P-N junction 1) With I_c on y-axis and V_{CE} on x-axis keeping V_{CE} (51. In case of common emitter p-n-p transistor in- put characteristic is a graph drawn (1) With I_c on y-axis V_{BE} on x-axis keeping V_{CE} (2) With I_B on y-axis V_{BE} on x-axis keeping V_{CE} (3) With I_c on y-axis I_B on x-axis keeping V_{CE} (4) has no P-N junction (51. In case of common emitter p-n-p transistor in- put characteristic is a graph drawn (1) With I_c on y-axis V_{BE} on x-axis keeping V_{CE} (51. In case of common emitter p-n-p transistor in- put characteristic is a graph drawn (1) With I_b on y-axis V_{BE} on x-axis keeping V_{CE} (51. In case of common emitter p-n-p transistor in- put characteristic is a graph drawn (1) With I_c on y-axis I_B on x-axis keeping V_{CE} (1) With V_{be} on y-axis and V_{CE} x-axis keeping I_B (2) With V_{be} on y-axis and V_{CE} x-axis keeping I_B		1) β times I 2) β times I		3) is either p-type or n-type
42. In common collector circuit, out put resistance is 1) very high 2) moderate 3) low 4) very low 43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 2) drifting of charges 3) both diffusion and drifting of charges 4) holes only 51. In case of common emitter p-n-p transistor in- put characteristic is a graph drawn 1) With I_c on y-axis and V_{CE} on x-axis keeping V_{CE} constant 3) With I_c on y-axis I_B on x-axis keeping V_{CE} constant 4) With V_{bc} on y-axis and V_{CE} x-axis keeping I_B		1) p times I_b 2) p times I_c		4) has no P-N junction
42.In common collector circuit, out put resistance is 1) very high 3) low2) moderate a) lowput characteristic is a graph drawn 1) With I_c on y-axis and V_{CE} on x-axis keeping I_B constant43.When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 3) both diffusion and drifting of charges 4) holes onlyput characteristic is a graph drawn 1) With I_c on y-axis and V_{CE} on x-axis keeping V_{CE} constant 3) With I_c on y-axis I_B on x-axis keeping V_{CE} constant 4) With V_{bc} on y-axis and V_{CE} x-axis keeping I_B		3) α times l_{b} 4) α times l_{c}	51.	In case of common emitter p-n-p transistor in-
1) very high2) moderate3) low4) very low43. When p-n junction is foward biased, the current across the junction is mainly due to1) diffusion of charges2) drifting of charges3) both diffusion and drifting of charges 4) holes only2) With I _c on y-axis V _{BE} on x-axis keeping V _{CE} constant3) With I _c on y-axis I _B on x-axis keeping V _{CE} constant4) With V _{bc} on y-axis and V _{CE} x-axis keeping I _B	42.	In common collector circuit, out put resistance is		put characteristic is a graph drawn
43. When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 2) drifting of charges 3) both diffusion and drifting of charges 4) holes only $I_{B} \text{ constant}$ 2) With I_{B} on y-axis V_{BE} on x-axis keeping V_{CE} constant 3) With I_{C} on y-axis I_{B} on x-axis keeping V_{CE} constant 4) With V_{be} on y-axis and V_{CE} x-axis keeping I_{B}		1) very high 2) moderate		1) With I _o on y-axis and V_{op} on x-axis keeping
 When p-n junction is foward biased, the current across the junction is mainly due to 1) diffusion of charges 3) both diffusion and drifting of charges 4) holes only With I_B on y-axis V_{BE} on x-axis keeping V_{CE} constant 3) With I_C on y-axis I_B on x-axis keeping V_{CE} constant 4) With V_{bc} on y-axis and V_{CE} x-axis keeping I_B 		3) low 4) very low		$I_{\rm p}$ constant
across the junction is mainly due to 1) diffusion of charges 2) drifting of charges 3) both diffusion and drifting of charges 4) holes only I_{B} on x -axis keeping V_{CE} I_{B} on x -axis keeping V_{CE} I_{B} on x -axis keeping I_{B} I_{C} on y -axis and V_{CE} x -axis keeping I_{B}	43.	When p-n junction is foward biased, the current		2) With I_p on y-axis V_{pr} on x-axis keeping $V_{}$
 1) diffusion of charges 2) drifting of charges 3) both diffusion and drifting of charges 4) holes only 3) With I_c on y-axis I_B on x-axis keeping V_{CE} constant 4) With V_{be} on y-axis and V_{CE} x-axis keeping I_B 		across the junction is mainly due to		constant
3) both diffusion and drifting of charges 4) holes only $(C_{CE} = 0) V(I_{C} = 0$		1) diffusion of charges 2) drifting of charges		3) With I_{-} on v-axis I_{-} on x-axis keeping V
4) holes only 4) With V_{be} on y-axis and V_{CE} x-axis keeping I_{B}		3) both diffusion and drifting of charges		constant
1 1 1 1 1 1 1 1 1 1		4) holes only		4) With V on v-axis and V x-axis keeping I
constant				constant

52.	The symbols in (1) and (2) represent standard		
	symbols for transistors. Then		
	\mathbf{C}		
	$\overline{B}(\overline{K})$ $\overline{B}(\overline{K})$		
	te te		
	(1) (2)		
	1) both represents p-n-p transistors		
	2) both represents n-p-n transistors		
	3) (1) represents n-p-n and (2) represents p-n-p		
	4) (1) represents p-n-p and (2) represents n-p-n		
53.	Avalanche breakdown is initiated by		
	1) majority carriers 2) minority carriers		
	3) both 4) neither		
54.	When a positive voltage signal is applied to the		
	base of a common emitter npn amplifier		
	1) The emitter current decreases		
	2) The collector voltage becomes more positive		
	5) The collector voltage becomes less positive		
55	4) The conector current decreases		
55.	1) Current and time 2) Voltage and time		
	3) Voltage and current 4) Voltage & resistance		
56	The electric field in the depletion layer of an un-		
50.	biased p-n junction is		
	1) Zero		
	2) from p-side to n-side		
	3) from n-side to p-side 4) Not defined		
57.	When a junction diode is reverse biased, the cur-		
	rent called drift current is due to		
	1) majority charge carriers of both n&p sides		
	2) minority charge carriers of both n&p sides		
	3) holes of both n &p sides		
	4) conduction band electrons of n-side only		
58.	In the following figures, the diodes are either for-		
	ward biased or reverse biased, choose the cor-		
	rect statement		
П (P	$^{+8V}$ $^{-2V}$ (O) $^{-8V}$ $^{-2V}$		
	1) both (P) and (Q) forward biased		
	2) both (P) and (Q) reverse biased		
	3) (P) is forward biased and (Q) is reverse bi-		
	ased		
	4) (Q) is forward biased and (P) is reverse bi-		
	ased		
59.	The avalanche breakdown in P-N junction is due to		
	1) shift of fermi level		
2) cumulative effect of conduction band electron			
	3) widening of forbidden gap		
	<i>s)</i> widening of forbidden gap		
L			

	4) high in	npurity conce	entration			
60.	In a trans	sistor the bas	e is made ve	ry thin and is		
	lightly do	ped with an i	impurity, bec	ause		
	1) to ena	ble the colle	ctor to colled	ct about 95%		
	of the hol	les or electror	ns coming fro	om the emitter		
	side		U			
	2) to enal	ble the emitte	er to emit sma	all number of		
	holes or o	holes or electrons				
	3) to sav	e the transist	ors from hig	h current ef-		
	fects		c	·		
	4) to enable the base to collect about 95% of					
	holes or o	electrons con	ning from the	e emitter side		
		KE	Y			
	1) 1	2) 1	3) 1	4) 45) 3		
	6) 1	7) 4	8) 1	9) 110) 1		
	11)2	12) 4	13) 2	14) 2		
	15) 3	16) 1	17) 2	18) 1		
	19) 3	20) 3				
	21) 2	22) 1	23) 1	24) 4		
	25) 4	26) 2	27) 4	28) 1		
	29) 2	30) 2	31)1	32) 4		

3/)1	38) 2	39) 3	40)4	
41) 1	42) 1	43) 1	44) 4	
45) 1	46) 1	47) 2	48) 4	
49) 3	50) 2	51) 2	52) 3	
53) 2	54) 3	55) 3	56) 3	
57) 2	58) 3	59) 2	60) 1	
LEVEL - 1				

35)4

36) 2

34) 2

DIODES

33) 1

	JDES	
1.	If the input frequency	of half-wave rectifier is n
	Hz ac, then its output i	S
	1) a constant dc	2) n/2 Hzpulsating dc
	3) n Hz pulsating dc	4) 2n Hz pulsating dc
2.	If the input frequency of	of a full wave rectifier is 50
	Hz ac. Its output frequ	ency is
	1) 50 Hz dc	2) 100 Hz dc
	3) 200 Hzdc	4) 500 Hz dc
3.	In a half wave rectifie	r output is taken across a
	90 ohm load resistor.	If the resistance of diode
	in forward biased con	dition is 10ohm, the effi-
	ciency of rectification	of ac power into dc power
	is	
	1) 40.6%	2) 81.2%
	3) 73.08 %	4) 36.54%

4. In a full wave rectifier output is taken across a load resistor of 800 ohm. If the resistance of diode in forward biased condition is 200 ohm, the efficiency of rectificaton of ac power into dc power is

3) 81.2% 4) 80% 5. In a p-n junction the depletion region is 400nm wide and electric field of $5 \times 10^5 Vm^{-1}$ exists in it. The minimum energy of a conduc- tion electron, which can diffuse from n-side to the p-side is 1) $4eV$ 2) $5eV$ 3) $0.4eV$ 4) $0.2eV$ 6. The reverse bias in a junction diode is changed from 5V to 15V then the value of current changes from 38 μ A to 88 μ A. The resistance of junc- tion diode will be 1) $4 \times 10^5 \Omega$ 2) $3 \times 10^5 \Omega$ 3) $2 \times 10^5 \Omega$ 4) $10^6 \Omega$ 7. The value of current in the adjacent diagram is (diode assumed to be ideal one) $\frac{44V}{\sqrt{20}}$ $\frac{3\Omega}{\sqrt{20}}$ $-1V$ 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $\frac{4V}{\sqrt{20}}$ $\frac{3\Omega}{\sqrt{20}}$ $-1V$ 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of $0.5V$ exists across a p-n junction. If the width of depletion layer is 10^6m , then intensity of electric field in this region will be 1) $1 \times 10^6 V/m$ 2) $5 \times 10^5 V/m$ 3) $4 \times 10^4 V/m$ 4) $2 \times 10^6 V/m$ 10. In half wave rectifier a p-n diode with internal resistance $2\Omega \Omega$ is used. If the load resistance of $2K \Omega$ is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100\% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) $4 \Omega 2) 0.25 \Omega 3) 2.5 \Omega 4) 8.5 \Omega$		1) 64.96% 2) 40.6%	13
5. In a p-n junction the depletion region is 400nm wide and electric field of $5 \times 10^{5} V m^{-1}$ exists in it. The minimum energy of a conduc- tion electron, which can diffuse from n-side to the p-side is 1) 4eV 2) 5eV 3) 0.4eV 4) 0.2eV 6. The reverse bias in a junction diode is changed from 5V to 15V then the value of current changes from 38 μ A to 88 μ A. The resistance of junc- tion diode will be 1) 4 x 10 ⁵ Ω 2) 3 x10 ⁵ Ω 3) 2 x 10 ⁵ Ω 4) 10 ⁶ Ω 7. The value of current in the adjacent diagram is (diode assumed to be ideal one) $\pm 4V$ 3Ω $\pm 1V$ 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $\pm 4V$ 3Ω $-1V$ 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10 ⁶ m, then intensity of electric field in this region will be 1) 1 x 10 ⁶ V/m 2) 5 x 10 ⁵ V/m 3) 4 x 10 ⁴ V/m 4) 2 x 10 ⁶ V/m 10. In half wave rectifier a p-n diode with internal resistance 20 Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.64% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9 Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4 Ω 2) 0.25 Ω 3) 2.5 Ω 4) 8.5 Ω		3) 81.2% 4) 80%	
400nm wide and electric field of $5 \times 10^{5} Vm^{-1}$ exists in it. The minimum energy of a conduction electron, which can diffuse from n-side to the p-side is 1) $4eV$ 2) $5eV$ 3) $0.4eV$ 4) $0.2eV$ 6. The reverse bias in a junction diode is changed from 5V to 15V then the value of current changes from 38μ A to 88μ A. The resistance of junction diode will be 1) $4 \times 10^{5} \Omega$ 2) $3 \times 10^{5} \Omega$ 3) $2 \times 10^{5} \Omega$ 4) $10^{6} \Omega$ 7. The value of current in the adjacent diagram is (diode assumed to be ideal one) $\frac{44V}{2}$ $\frac{3\Omega}{2}$ $+1V$ 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $\frac{4V}{2}$ $\frac{3\Omega}{2} \times -1V$ 1) $0.1 \text{ amp } 2$) $0.01 \text{ amp } 3$) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is $10^{6}m$, then intensity of electric field in this region will be 1) $1 \times 10^{6} V/m$ 2) $5 \times 10^{5} V/m$ 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of $2K \Omega$ is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 200 11. A full wave p-n diode rectifier uses a load resistance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the efficiency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 2.5Ω 4) 8.5Ω 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resistance of the diode is $1 + 4\Omega - 2 + 0.25\Omega - 3 + 0.5\Omega$ 4) 8.5Ω	5.	In a p-n junction the depletion region is	
exists in it. The minimum energy of a conduc- tion electron, which can diffuse from n-side to the p-side is 1) $4eV$ 2) $5eV$ 3) $0.4eV$ 4) $0.2eV$ 6. The reverse bias in a junction diode is changed from $5V$ to $15V$ then the value of current changes from 38μ A to 88μ A. The resistance of junc- tion diode will be 1) $4 \times 10^5 \Omega$ 2) $3 \times 10^5 \Omega$ 3) $2 \times 10^5 \Omega$ 4) $10^6 \Omega$ 7. The value of current in the adjacent diagram is (diode assumed to be ideal one) $\frac{44V}{2}$ $\frac{3\Omega}{2}$ +1V 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $\frac{4V}{2}$ $\frac{3\Omega}{2} \propto -1V$ 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10^6m , then intensity of electric field in this region will be 1) 1 $\times 10^6 V/m$ 2) $5 \times 10^5 V/m$ 3) $4 \times 10^4 V/m$ 4) $2 \times 10^6 V/m$ 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of $2K_{\Omega}$ is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1 21 M_{Ω} 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		400nm wide and electric field of $5 \times 10^5 Vm^{-1}$	
tion electron, which can diffuse from n-side to the p-side is 1) $4eV$ 2) $5eV$ 3) $0.4eV$ 4) $0.2eV$ 6. The reverse bias in a junction diode is changed from 5V to 15V then the value of current changes from $38 \ \mu$ A to $88 \ \mu$ A. The resistance of junc- tion diode will be 1) $4 \times 10^5 \Omega$ 2) $3 \times 10^5 \Omega$ 3) $2 \times 10^5 \Omega$ 4) $10^6 \Omega$ 7. The value of current in the adjacent diagram is (diode assumed to be ideal one) $\frac{44V}{}$ 3Ω +1V 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $\frac{4V}{}$ $3\Omega \wedge$ -1V 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10 ⁶ m, then intensity of electric field in this region will be 1) $1 \times 10^6 V/m$ 2) $5 \times 10^5 V/m$ 3) $4 \times 10^4 V/m$ 4) $2 \times 10^6 V/m$ 10. In half wave rectifier a p-n diode with internal resistance 20 Ω is used. If the load resistance of $2K_\Omega$ is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9 Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4_Ω 2) 0.25_Ω 3) 2.5_Ω 4) 8.5_Ω		exists in it. The minimum energy of a conduc-	
the p-side is 1) $4eV$ 2) $5eV$ 3) $0.4eV$ 4) $0.2eV$ 6. The reverse bias in a junction diode is changed from 5V to 15V then the value of current changes from $38 \ \mu$ A to $88 \ \mu$ A. The resistance of junc- tion diode will be 1) $4 \times 10^5 \Omega$ 2) $3 \times 10^5 \Omega$ 3) $2 \times 10^5 \Omega$ 4) $10^6 \Omega$ 7. The value of current in the adjacent diagram is (diode assumed to be ideal one) $\frac{44V}{\sqrt{3}\Omega}$ +1V 10 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $\frac{4V}{\sqrt{3}\Omega}$ -1V 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10^6m , then intensity of electric field in this region will be 1) 1 $\times 10^6 V/m$ 2) $5 \times 10^5 V/m$ 3) $4 \times 10^4 V/m$ 4) $2 \times 10^6 V/m$ 10. In half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of $2e$ A is used. If the internal resistance of $2e$ A bild wave rectifier is 1) 80.64% 2) 40.2% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is $1 = 0 2 \cdot \Omega = 100\%$, $0.8 \pm \Omega = 100\%$		tion electron, which can diffuse from n-side to	14
1) $4eV$ 2) $5eV$ 3) $0.4eV$ 4) $0.2eV$ 6. The reverse bias in a junction diode is changed from $5V$ to $15V$ then the value of current changes from $38 \ \mu A$ to $88 \ \mu A$. The resistance of junc- tion diode will be151) $4 \times 10^5 \Omega$ 2) $3 \times 10^5 \Omega$ 153) $2 \times 10^5 \Omega$ 4) $10^6 \Omega$ 157. The value of current in the adjacent diagram is (diode assumed to be ideal one)16 $+4V$ 3Ω $+1V$ 1) 02) 1 amp 3) 1.66 amp4) 15 amp8. The value of current is the following diagrams is (diode assumed to be ideal one)174V 3Ω $-1V$ 1) 0.1 amp2) 0.01 amp 3) 1 amp4) zero9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is $10^6 m$, then intensity of electric field in this region will be 1) $1 \times 10^6 V/m$ 1810. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of $2K \Omega$ is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 11. A full wave p-n diode rectifier uses a load resist- tance of 1300 Ω . No filter is used a load: $3) 13.9\%$ 2011. A full wave p-n diode rectifier is $1) 80.64\%$ 2) 40.6% $3) 13.9\%$ 2112. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is $1) 4\Omega$ 2012. In a silicon diode, the forward dynamic ac resis- tance of the diode is $1) 4\Omega$ 2012. In a silicon diode, the forward d		the p-side is	
3) $0.4eV$ 4) $0.2eV$ 6. The reverse bias in a junction diode is changed from 5V to 15V then the value of current changes from $38 \ \mu \ A \ 0 \ 88 \ \mu \ A$. The resistance of junc- tion diode will be 1) $4 \times 10^5 \Omega$ 2) $3 \times 10^5 \Omega$ 3) $2 \times 10^5 \Omega$ 4) $10^6 \Omega$ 7. The value of current in the adjacent diagram is (diode assumed to be ideal one) $44V$ 3 Ω +1V 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $4V$ 3 Ω_{Ab} -1V 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10^6m , then intensity of electric field in this region will be 1) 1 $\times 10^6 \ V/m$ 2) $5 \times 10^5 \ V/m$ 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the ofraward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		1) 4eV 2) 5eV	
6. The reverse bias in a junction diode is changed from 5V to 15V then the value of current changes from $38 \ \mu A \ to 88 \ \mu A$. The resistance of junc- tion diode will be 1) $4 \times 10^5 \Omega$ 2) $3 \times 10^5 \Omega$ 3) $2 \times 10^5 \Omega$ 4) $10^6 \Omega$ 7. The value of current in the adjacent diagram is (diode assumed to be ideal one) $44V$ 3 Ω +1V 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $4V$ 3 Ω -1V 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10 ⁶ m, then intensity of electric field in this region will be 1) 1 x 10 ⁶ V/m 2) 5 x 10 ⁵ V/m 3) 4 x 10 ⁴ V/m 4) 2 x 10 ⁶ V/m 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9 Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25 Ω 3) 2.5 Ω 4) 8.5 Ω		3) 0.4eV 4) 0.2eV	
from 5V to 15V then the value of current changes from 38 μ A to 88 μ A. The resistance of junc- tion diode will be 1) 4 x 10 ⁵ Ω 2) 3 x 10 ⁵ Ω 3) 2 x 10 ⁵ Ω 4) 10 ⁶ Ω 7. The value of current in the adjacent diagram is (diode assumed to be ideal one) $\pm 4V$ 3Ω $\pm 1V$ 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $4V$ 3Ω $\pm 1V$ 1) 0.1 amp 2) 0.01 amp 3) 1.66 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10 ⁶ m, then intensity of electric field in this region will be 1) 1 x 10 ⁶ V/m 2) 5 x 10 ⁵ V/m 3) 4 x 10 ⁴ V/m 4) 2 x 10 ⁶ V/m 10. In half wave rectifier a p-n diode with internal resistance 20 Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9 Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4 Ω 2) 0.25 Ω 3) 2.5 Ω 4) 8.5 Ω	6.	The reverse bias in a junction diode is changed	
from $38 \ \mu$ A to $88 \ \mu$ A. The resistance of junction diode will be 1) $4 \times 10^5 \Omega$ 2) $3 \times 10^5 \Omega$ 3) $2 \times 10^5 \Omega$ 4) $10^6 \Omega$ 7. The value of current in the adjacent diagram is (diode assumed to be ideal one) $44V$ 3 Ω $+1V$ 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $4V$ 3 Ω $-1V$ 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10^6 m, then intensity of electric field in this region will be 1) 1 $\times 10^6$ V/m 2) 5×10^5 V/m 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resistance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the efficiency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resistance of the diode is $1) 4\Omega$ 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		from 5V to 15V then the value of current changes	
tion diode will be 1) $4 \times 10^5 \Omega$ 2) $3 \times 10^5 \Omega$ 3) $2 \times 10^5 \Omega$ 4) $10^6 \Omega$ 7. The value of current in the adjacent diagram is (diode assumed to be ideal one) 44V 30 +1V 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) 44V 30 +1V 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) 44V 30 -1V 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10 ⁶ m, then intensity of electric field in this region will be 1) 1 x 10 ⁶ V/m 2) 5 x 10 ⁵ V/m 3) 4 x 10 ⁴ V/m 4) 2 x 10 ⁶ V/m 10. In half wave rectifier a p-n diode with internal resistance 20 Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9 Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4 Ω 2) 0.25 Ω 3) 2.5 Ω 4) 8.5 Ω		from 38 μ A to 88 μ A. The resistance of junc-	15
1) $4 \times 10^{9} \Omega$ 2) $3 \times 10^{9} \Omega$ 3) $2 \times 10^{5} \Omega$ 4) $10^{6} \Omega$ 7. The value of current in the adjacent diagram is (diode assumed to be ideal one) $44V$ 3 Ω $+1V$ 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $4V$ 3 Ω $-1V$ 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10^{6} m, then intensity of electric field in this region will be 1) 1×10^{6} V/m 2) 5×10^{5} V/m 3) 4×10^{4} V/m 4) 2×10^{6} V/m 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of $2K \Omega$ is used in the circuit, then the efficiency of this half wave p-n diode rectifier uses a load resis- tance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.2% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		tion diode will be	
3) $2 \times 10^{9} \Omega$ 4) $10^{6} \Omega$ 7. The value of current in the adjacent diagram is (diode assumed to be ideal one) $+4V$ 3 Ω $+1V$ 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $4V$ 3Ω $-1V$ 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10^{6} m, then intensity of electric field in this region will be 1) 1 $\times 10^{6}$ V/m 2) 5 $\times 10^{5}$ V/m 3) 4×10^{4} V/m 4) 2×10^{6} V/m 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.2% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		1) $4 \times 10^{5} \Omega$ 2) $3 \times 10^{5} \Omega$	
7.The value of current in the adjacent diagram is (diode assumed to be ideal one) $\pm 4V$ $\Im\Omega$ $\pm 4V$ $\pm 4V$ $\Im\Omega$ $\pm 1V$ 1) 02) 1 amp $\Im\Omega$ $\pm 15 amp168.The value of current is the following diagrams is(diode assumed to be ideal one)T4V\Im\Omega_{VA}\pm 15171) 0.1 amp2) 0.01 amp\Im\Im171) 0.1 amp2) 0.01 amp\Im\Im181) 0.1 amp2) 0.01 amp\Im\Im181) 1 amp4) zero189.A potential barrier of 0.5V exists across a p-njunction. If the width of depletion layer is 10^6m,then intensity of electric field in this region will be1) 1 x 106 V/m2) 5 x 105 V/m3) 4 x 104 V/m1810.In half wave rectifier a p-n diode with internalresistance 20 \Omega is used. If the load resistance of2K \Omega is used in the circuit, then the efficiency ofthis half wave rectifier is1) 80.4%2) 40.2%3) 20%2011.A full wave p-n diode rectifier uses a load resis-tance of 1300 \Omega. No filter is used. If the internalresistance of each diode is 9 \Omega, then the efficiency of this full wave rectifier is1) 80.64%2) 40.6%3) 13.9%4) 100%2112.In a silicon diode, the forward current changesby 2.5mA when the voltage changes from 0.08to 0.09 V, then the forward dynamic ac resis-tance of the diode is1) 4\Omega2) 0.25\Omega3) 2.5\Omega4) 8.5\Omega$		3) $2 \times 10^{5} \Omega$ 4) $10^{6} \Omega$	
16 (diode assumed to be ideal one) $\frac{44V}{3\Omega} +1V$ 16 1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $\frac{4V}{3\Omega} -1V$ 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10 ⁶ m, then intensity of electric field in this region will be 1) 1 x 10 ⁶ V/m 2) 5 x 10 ⁵ V/m 3) 4 x 10 ⁴ V/m 4) 2 x 10 ⁶ V/m 10. In half wave rectifier a p-n diode with internal resistance 20 Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9 Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4 Ω 2) 0.25 Ω 3) 2.5 Ω 4) 8.5 Ω	7.	The value of current in the adjacent diagram	
$+4V$ 3Ω $+1V$ 161) 02) 1 amp3) 1.66 amp4) 15 amp8.The value of current is the following diagrams is (diode assumed to be ideal one)Tr $-4V$ $3\Omega_{Vh}$ $-1V$ 1) 0.1 amp2) 0.01 amp3) 1 amp4) zero9.A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is $10^{6}m$, then intensity of electric field in this region will be 1) 1 x 10^{6} V/m1810.In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of $2K \Omega$ is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20%4) 50%2011.A full wave p-n diode rectifier uses a load resistance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the efficiency of this half wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9%4) 100%2212.In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		is (diode assumed to be ideal one)	
1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $4V$ $3\Omega_{M}$ $-1V$ 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10^{6} m, then intensity of electric field in this region will be 1) 1 x 10^{6} V/m 2) 5 x 10^{5} V/m 3) $4 x 10^{4}$ V/m 4) 2 x 10^{6} V/m 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of $2K \Omega$ is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		$+d\mathbf{V}$ 3Ω $+1\mathbf{V}$	16
1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $4V$ 3 Ω_{M} -1V 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10 ⁶ m, then intensity of electric field in this region will be 1) 1 x 10 ⁶ V/m 2) 5 x 10 ⁵ V/m 3) 4 x 10 ⁴ V/m 4) 2 x 10 ⁶ V/m 10. In half wave rectifier a p-n diode with internal resistance 20 Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9 Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4 Ω 2) 0.25 Ω 3) 2.5 Ω 4) 8.5 Ω			
1) 0 2) 1 amp 3) 1.66 amp 4) 15 amp 8. The value of current is the following diagrams is (diode assumed to be ideal one) $4V$ 3 Ω_{M} -1V 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10 ⁶ m, then intensity of electric field in this region will be 1) 1 x 10 ⁶ V/m 2) 5 x 10 ⁵ V/m 3) 4 x 10 ⁴ V/m 4) 2 x 10 ⁶ V/m 10. In half wave rectifier a p-n diode with internal resistance 20 Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9 Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4 Ω 2) 0.25 Ω 3) 2.5 Ω 4) 8.5 Ω			
8. The value of current is the following diagrams is (diode assumed to be ideal one) 4. The value of current is the following diagrams is (diode assumed to be ideal one) 4. $4V$ 3 Ω_{A} -1V 1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10 ⁶ m, then intensity of electric field in this region will be 1) 1 x 10 ⁶ V/m 2) 5 x 10 ⁵ V/m 3) 4 x 10 ⁴ V/m 4) 2 x 10 ⁶ V/m 10. In half wave rectifier a p-n diode with internal resistance 20 Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9 Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4 Ω 2) 0.25 Ω 3) 2.5 Ω 4) 8.5 Ω		1)0 2)1 amp	
8.The value of current is the following diagrams is (diode assumed to be ideal one)The 17 $4V$ $3\Omega_{M}$ -1V-1V1) 0.1 amp2) 0.01 amp 3) 1 amp4) zero9.A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10 °m, then intensity of electric field in this region will be 1) 1 x 10° V/m1810.In half wave rectifier a p-n diode with internal resistance 20 Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4%2) 40.2% 3) 20%2011.A full wave p-n diode rectifier uses a load resistance of 1300 Ω. No filter is used. If the internal resistance of each diode is 9 Ω, then the efficiency of this full wave rectifier is 1) 80.64%2) 40.6% 2) 40.6% 3) 13.9%2112.In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resistance of the diode is 1) 4Ω 2) 0.25 Ω3) 2.5 Ω4) 8.5 Ω	8	3) 1.00 amp 4) 13 amp The value of current is the following diagrams is	
17 10.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10^{6} m, then intensity of electric field in this region will be 1) 1 x 10^{6} V/m 2) 5 x 10^{5} V/m 3) 4 x 10^{4} V/m 4) 2 x 10^{6} V/m 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω	0.	(diode assumed to be ideal one)	
$4V$ $3 \Omega_{M}$ -IV171) 0.1 amp 3) 1 amp2) 0.01 amp 3) 1 amp189. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10.6m, then intensity of electric field in this region will be 1) 1 x 106 V/m1810. In half wave rectifier a p-n diode with internal resistance 20 Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 3) 20%2011. A full wave p-n diode rectifier uses a load resistance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9 Ω , then the efficiency of this full wave rectifier is 1) 80.64% 3) 13.9% 4) 100%2112. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4 Ω 2) 0.25 Ω 3) 2.5 Ω 4) 8.5 Ω 22		(unde assumed to be ideal offe)	
1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10^{6} m, then intensity of electric field in this region will be 1) 1 x 10^{6} V/m 2) 5 x 10^{5} V/m 3) 4 x 10^{4} V/m 4) 2 x 10^{6} V/m 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		$-4V$ $3\Omega_{\mu}$ $-1V$	17
1) 0.1 amp 2) 0.01 amp 3) 1 amp 4) zero 9. A potential barrier of 0.5V exists across a p-n junction. If the width of depletion layer is 10^{6} m, then intensity of electric field in this region will be 1) 1 x 10^{6} V/m 2) 5 x 10^{5} V/m 3) 4 x 10^{4} V/m 4) 2 x 10^{6} V/m 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of $2K \Omega$ is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω			
3) 1 amp 4) zero 9. A potential barrier of $0.5V$ exists across a p-n junction. If the width of depletion layer is 10^{6} m, then intensity of electric field in this region will be 1) 1×10^{6} V/m 2) 5×10^{5} V/m 3) 4×10^{4} V/m 4) 2×10^{6} V/m 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of $2K \Omega$ is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 20 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resistance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the efficiency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resistance of the diode is $1) 4 \Omega$ 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		1) 0.1 amp 2) 0.01 amp	
9. A potential barrier of $0.5V$ exists across a p-n junction. If the width of depletion layer is 10^{6} m, then intensity of electric field in this region will be 1) 1×10^{6} V/m 2) 5×10^{5} V/m 3) 4×10^{4} V/m 4) 2×10^{6} V/m 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 20 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 22 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		3) 1 amp 4) zero	
junction. If the width of depletion layer is 10° m, then intensity of electric field in this region will be 1) 1 x 10^{6} V/m 2) 5 x 10^{5} V/m 3) 4 x 10^{4} V/m 4) 2 x 10^{6} V/m 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 20 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω	9.	A potential barrier of 0.5V exists across a p-n	18
inen intensity of electric field in this region will be 1) $1 \times 10^6 \text{ V/m}$ 2) $5 \times 10^5 \text{ V/m}$ 3) $4 \times 10^4 \text{ V/m}$ 4) $2 \times 10^6 \text{ V/m}$ 10. In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of $2K \Omega$ is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 20 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		junction. If the width of depletion layer is 10^{6} m,	
1) 1 X 10 V/m 2) 3 X 10 V/m 3) 4 x 10 ⁴ V/m 4) 2 x 10 ⁶ V/m 10. In half wave rectifier a p-n diode with internal resistance 20 Ω is used. If the load resistance of 2K Ω is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300 Ω . No filter is used. If the internal resistance of each diode is 9 Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4 Ω 2) 0.25 Ω 3) 2.5 Ω 4) 8.5 Ω		then intensity of electric field in this region will be 1) $1 \times 10^6 \text{ V/m}$ 2) $5 \times 10^5 \text{ V/m}$	
10.In half wave rectifier a p-n diode with internal resistance 20Ω is used. If the load resistance of $2K \Omega$ is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 3) 20% 1911.A full wave p-n diode rectifier uses a load resistance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the efficiency of this full wave rectifier is 1) 80.64% 3) 13.9% 2012.In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to $0.09 V$, then the forward dynamic ac resistance of the diode is 1) 4Ω 22		$\begin{array}{cccc} 1) & 1 \times 10^{-5} \text{ V/m} \\ 3) & 4 \times 10^{4} \text{ V/m} \\ \end{array} \begin{array}{c} 2) & 5 \times 10^{5} \text{ V/m} \\ 4) & 2 \times 10^{6} \text{ V/m} \\ \end{array}$	
resistance 20Ω is used. If the load resistance of $2K \Omega$ is used in the circuit, then the efficiency of this half wave rectifier is 1) 80.4% 2) 40.2% 20 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resistance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the efficiency of this full wave rectifier is 1) 80.64% 2) 40.6% 2) 40.6% 22 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resistance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω	10	In half wave rectifier a p-n diode with internal	
$\begin{array}{c} 2K_{\Omega} \text{ is used in the circuit, then the efficiency of this half wave rectifier is} \\ 1) 80.4\% & 2) 40.2\% \\ 3) 20\% & 4) 50\% \end{array}$ $\begin{array}{c} 20 \\ 11. A \text{ full wave p-n diode rectifier uses a load resistance of 1300 \Omega. No filter is used. If the internal resistance of each diode is 9 \Omega, then the efficiency of this full wave rectifier is 1) 80.64\% & 2) 40.6\% \\ 3) 13.9\% & 4) 100\% \end{aligned}$ $\begin{array}{c} 22 \\ 22 \\ 22 \\ 22 \\ 23 \\ 22 \\ 24 \\ 22 \\ 22$		resistance $20 \mathrm{O}$ is used. If the load resistance of	19
this half wave rectifier is 1) 80.4% 2) 40.2% 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resis- tance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the effi- ciency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		$2K_{\Omega}$ is used in the circuit, then the efficiency of	
1) 80.4% 2) 40.2% 203) 20% 4) 50% 2111. A full wave p-n diode rectifier uses a load resistance of 1300Ω . No filter is used. If the internal resistance of each diode is 9Ω , then the efficiency of this full wave rectifier is211) 80.64% 2) 40.6% 213) 13.9% 4) 100% 2212. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resistance of the diode is211) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		this half wave rectifier is	
 3) 20% 4) 50% 11. A full wave p-n diode rectifier uses a load resistance of 1300 Ω. No filter is used. If the internal resistance of each diode is 9 Ω, then the efficiency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resistance of the diode is 4Ω 0.25Ω 2.5Ω 		1) 80.4% 2) 40.2%	20
 11. A full wave p-n diode rectifier uses a load resistance of 1300 Ω. No filter is used. If the internal resistance of each diode is 9 Ω, then the efficiency of this full wave rectifier is 80.64% 40.6% 13.9% 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resistance of the diode is 4Ω 0.25Ω 2.5Ω 		3) 20% 4) 50%	
$tance of 1300 \Omega$. No filter is used. If the internal resistance of each diode is 9Ω , then the efficiency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100%2112. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω 21	11.	A full wave p-n diode rectifier uses a load resis-	
resistance of each diode is 9Ω , then the efficiency of this full wave rectifier is 1) 80.64% 2) 40.6% 3) 13.9% 4) 100% 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4Ω 2) 0.25Ω 3) 2.5Ω 4) 8.5Ω		tance of 1300Ω . No filter is used. If the internal	21
$\begin{array}{c} \text{ciency of this full wave rectifier is} \\ 1) 80.64\% & 2) 40.6\% \\ 3) 13.9\% & 4) 100\% \\ 12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resistance of the diode is \\ 1) 4_{\Omega} & 2) 0.25_{\Omega} & 3) 2.5_{\Omega} & 4) 8.5_{\Omega} \\ \end{array}$		resistance of each diode is 9_{Ω} , then the effi-	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		ciency of this full wave rectifier is 1) 80.64% 2) 40.6%	
12. In a silicon diode, the forward current changes by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4_{Ω} 2) 0.25_{Ω} 3) 2.5_{Ω} 4) 8.5_{Ω}		$\begin{array}{cccccccccccccccccccccccccccccccccccc$	22
by 2.5mA when the voltage changes from 0.08 to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4_{Ω} 2) 0.25_{Ω} 3) 2.5_{Ω} 4) 8.5_{Ω}	12	In a silicon diode, the forward current changes	
to 0.09 V, then the forward dynamic ac resis- tance of the diode is 1) 4_{Ω} 2) 0.25_{Ω} 3) 2.5_{Ω} 4) 8.5_{Ω}		by 2.5mA when the voltage changes from 0.08	
tance of the diode is 1) 4_{Ω} 2) 0.25_{Ω} 3) 2.5_{Ω} 4) 8.5_{Ω}		to 0.09 V, then the forward dynamic ac resis-	
1) 4_{Ω} 2) 0.25_{Ω} 3) 2.5_{Ω} 4) 8.5_{Ω}		tance of the diode is	
		1) 4_{Ω} 2) 0.25_{Ω} 3) 2.5_{Ω} 4) 8.5_{Ω}	

13.	An intrinsic semi cond	uctor has 10 ¹⁸ /m ³ free
	electron and is doped wi	th pentavalent impurity
	of 10^{24} /m ³ . Then the free	electrons density order
	increase by	
	1) 4 2) 3	3) 5 4) 6
14.	The potential barrier of	a silicon junction
	diode is 0.7V. If the thi	ckness of the depletion
	layer in it is 10^{-4} cm. T	hen the intensity of
	electric field across the	junction is
	1) $7 \times 10^{3} V/m$	2) $7 \times 10^5 V / m$
	3) $7 \times 10^{-5} V / m$	4) $7 \times 10^{-4} V / m$
15.	A diode made of silicon l	has a barrier potential of
	0.7V and a currrent of 20)mA passes through the
	diode when a battery of	emf 3V is connected to
	it. The wattage of the rea	sistor and diode are
	1) 0.046W, 0.014W	2) 4.6W, 0.14W
	3) 0.46W, 0.14W	4) 46W, 14W
16.	A p-n junction ideal diod	le is in forward bias and
	a current of 20mA flow	vs through the circuit.
	When it is in reverse bia	s, the magnitude of the
	current is	
	1) 20mA	2) Infinity
	3) Zero	4) 30 mA
TRA	ANSISTORS	
17.	In an npn transistor the	base and collector cur-
	rents are 100μ A and 9	mA respectively. Then
	the emitter current will b	e
	1)9.1mA	2) 18.2mA
	3) 3.91 <i>µ</i> A	4) 18.2 μ A
18.	For a common emitter c	onnection the values of
	constant collector curre	nt and base current are
	5mA and 50 μ A respect	tively. The current gain
	will be	
	1) 10 2) 20	3) 40 4) 100
19.	A transistor has a base cu	rent of 1mA and emitter
	current 100mA. The current	ent transfer ratio will be
	1) 0.9 2) 0.99	3) 1.1 4) 10.1
20.	In the above problem, th	e current amplification
	factor (β) will be	
	1) 89 2) 95	3) 99 4) 101
21.	A transistor has $\alpha = 0.9$	5. If the emitter current
	is 10mA, then the collec	tor current will be
	1)9.5 mA 2) 10mA	3) 0.95mA 4) 95mA
22.	A transistor has $\alpha = 0.9$	5. If the emitter current
	is 10mA the base curren	t will be
	1) 0.1mA	2) 0.2mA
	3) 0.3mA	4) 0.5mA