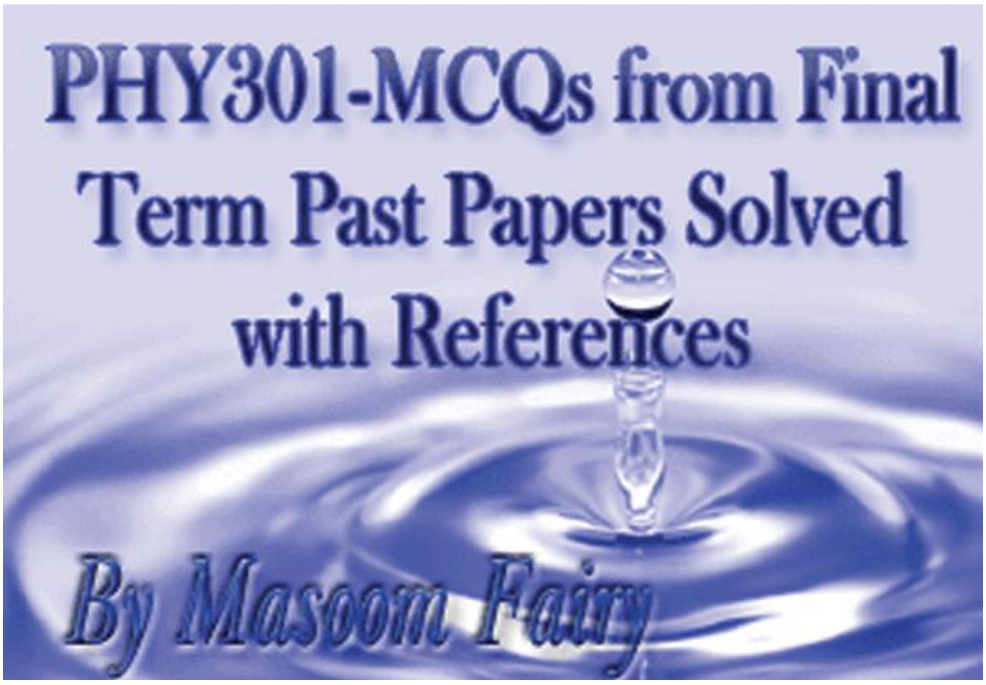
DATE 14/2/2013

رہی تعلیم مشرق میں، نہ مغرب میں رہی غیرت

یہ جتنے پڑھتے جاتے ہیں، جہالت بڑھتی جاتی ہے!



Eini

FINALTERM EXAMINATION

Spring 2010

PHY301- Circuit Theory

Time: 90 min

Marks: 60

Question No: 1 (Marks: 1) - Please choose one

If we connect 3 capacitors in parallel, the combined effect of all these capacitors will be

► **Equal to the sum of individual capacitances (PAGE 22)**

► sum of reciprocals of individual capacitors

► zero

► product of all

Question No: 2 (Marks: 1) - Please choose one

In an N- type semicondutor material , the majority carrier are

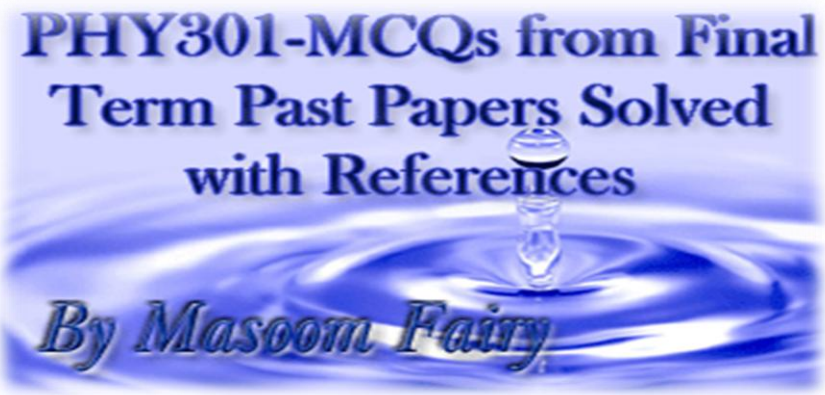
► holes

► **electrons (PAGE 122)**

► ions

► protons

Question No: 3 (Marks: 1) - Please choose one



Semiconductor element in pure form is called

► extrinsic

► P type

► **intrinsic (PAGE 121)**

► N type

Question No: 4 (Marks: 1) - Please choose one

An element with 6 protons and 6 neutrons has atomic no. value

► **6 (PAGE 5)**

► 12

► 18

► 8

Question No: 5 (Marks: 1) http://vustudents.ning.com- Please choose one

Isotopes of an element have

► **Different mass number but same atomic number**

► Different atomic number but same mass number

► Same atomic and mass number

► Same no. of neutron

http://wiki.answers.com/Q/Do_isotopes_have_the_same_atomic_number_but_different_mass_numbers

Question No: 6 (Marks: 1) - Please choose one

Which of the following is true about the electrical circuit in your flashlight?

► **The battery supplies the charge (electrons) which move through the wires.**

► The battery supplies the charge (protons) which move through the wires

► The battery supplies energy which raises charge from low to high voltage

► Battery gets energy from circuit.

Question No: 7 (Marks: 1) - Please choose one

If we connect 3 capacitors in series, the combined effect of all these capacitors will be

► equal to the sum of individual capacitors

► **the sum of reciprocals of individual capacitors (PAGE 22)**

► zero

► product of all

Question No: 8 (Marks: 1) - Please choose one

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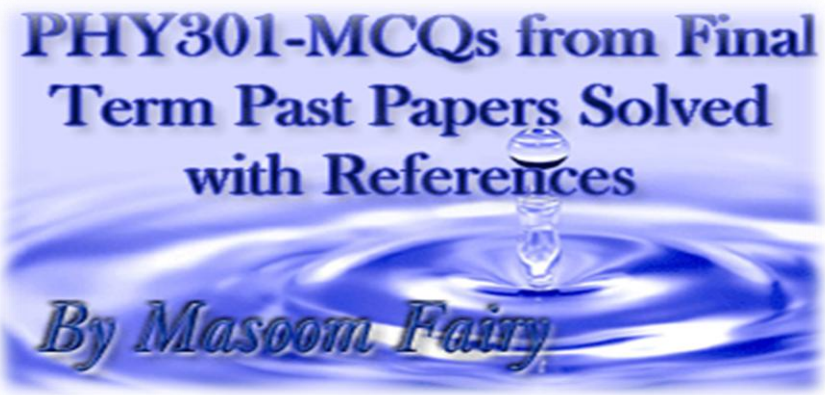
which of following relation is true for turn ratio and voltage ratio of transformer

► N2/N1=V1/V2V1



► N2/N1=V1/V2

► N1/N2=V1V2/V2

► **N2/N1=V2/V1 (PAGE 144)**

Question No: 9 (Marks: 1) - Please choose one

Leakage current of semiconductor diode is caused by

► chemical energy

► heat energy

► barrier voltage

► **doping impurity**

Question No: 10 (Marks: 1) - Please choose one

Rectification is the process of

► converting DC into AC

► increasing output waveform

► **converting AC into DC (PAGE 126)**

► converting diode into capacitor

Question No: 11 (Marks: 1) - Please choose one

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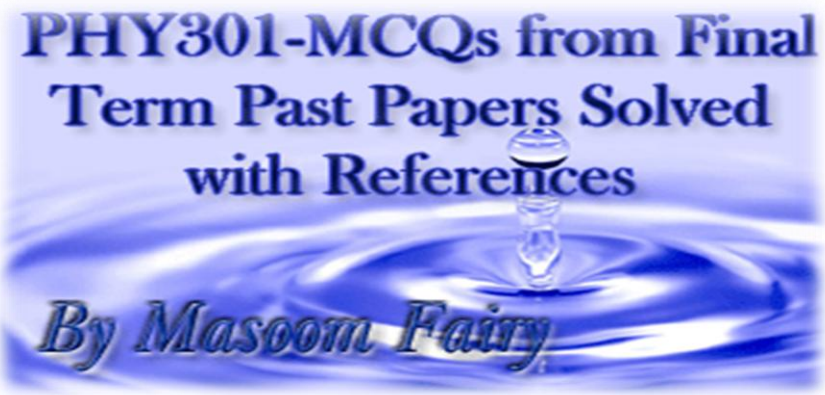
which rectifier is used to get either positive or negative part of input at output

► **half wave rectifier (PAGE 147)**



► full wave rectifier

► bridge rectifier

► negative half wave rectifier

Question No: 12 (Marks: 1) - Please choose one

The reference/common point among all the nodes without insertion of any component between them is called

► node

► **ground (PAGE 42)**

► loop

► mesh

Question No: 13 (Marks: 1) - Please choose one

In a Norton's theorem , norton's resistance **Inor** is calculated

► at open terminals of the open circuit

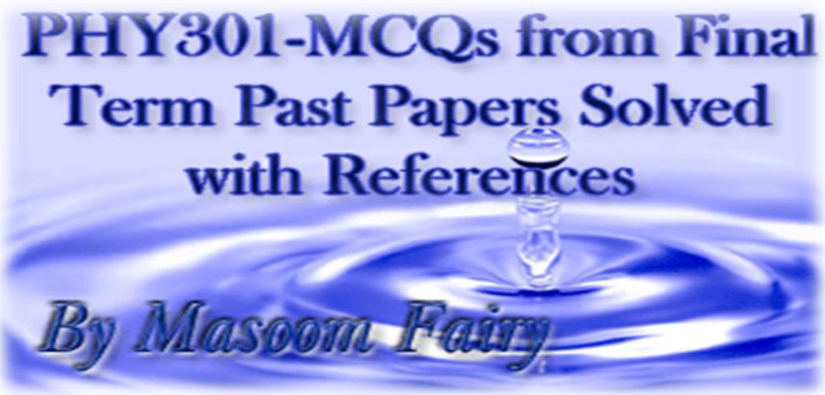
► **by short circuiting the open terminal of the circuit (PAGE 113)**

► across the load

► any where

Question No: 14 (Marks: 1) - Please choose one

In a thevenin's theorem , the condition to find Vth is



► to add more load resistance

► **to remove load resistance (PAGE 100)**

► to convert load into short circuit

► open circuit the current source

Question No: 15 (Marks: 1) - Please choose one

Using superposition theorem, for a circuit containing independent sources, any remaining voltage source is

► remain same

► made zero by replacing them by open circuit

► made zero by replacing them by capacitor

► **made zero by replacing them by short circuit (PAGE 92)**

Question No: 16 (Marks: 1) - Please choose one

In Norton, s theorem , while calculating Rn

► Short circuit the current source and open circuit the voltage source

► **open circuit the current source and short circuit the voltage source (PAGE 114 Example number 1 Step3)**

► insert the load

► just open circuit current source

Question No: 17 (Marks: 1) - Please choose one

The primary function of a filter is to

- ► Minimize ac input variations
- ► Suppress odd harmonics in the rectifier output
- ► Stabilize dc level of the output voltage
- ► **Remove ripples from the rectified output (PAGE 159)**

Question No: 18 (Marks: 1) - Please choose one

The PIV of a half wave rectifier circuit with a shunt capacitor filter is

- ► $2V_m$
- ► **V_m (PAGE 161)**
- ► $V_m/2$
- ► $3V_m$

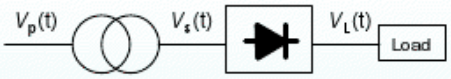
Question No: 19 (Marks: 1) - Please choose one

The ripple factor of a bridge rectifier

- ► 1.21
- ► **0.406 (Not Conform)**
- ► 0.812
- ► 1.11

Comparison among topologies 1–Ph.

- Secondary voltage is sinusoidal: $v_s(t) = V_s \sin(2\pi f_{mains} t)$
- Resistive Load
- Ideal devices (no device losses)



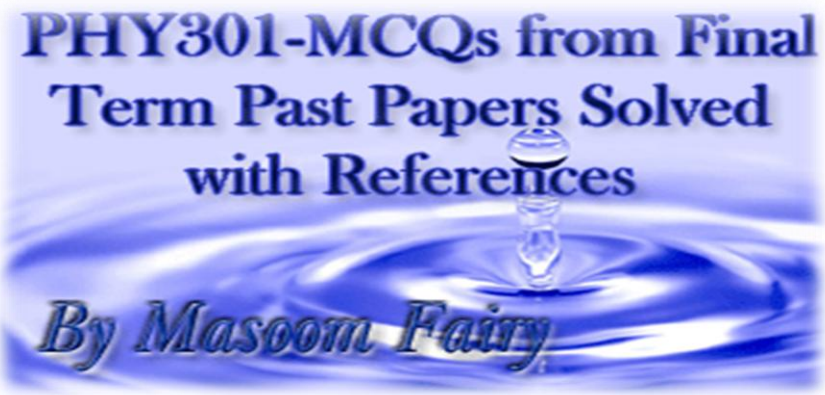
Parameter	Half–Wave	Full – Wave (Center–tapped)	Full – Wave (Bridge)
Rectified Voltage – V_{DC}	$V_s/\pi = 0.318 \cdot V_s$	$2 \cdot V_s/\pi = 0.636 \cdot V_s$	$2 \cdot V_s/\pi = 0.636 \cdot V_s$
rms Output Voltage – V_L	$V_s/2 = 0.318 \cdot V_s$	$V_s/\sqrt{2} = 0.707 \cdot V_s$	$V_s/\sqrt{2} = 0.707 \cdot V_s$
Form Factor – FF	1.57	1.11	1.11
Rectification Ratio – η	0.405	0.81	0.81
Ripple Factor – RF	1.21	0.482	0.482
Transformer Utilization Factor – TUF	0.286	0.572	0.81
Diode Peak Inverse Voltage (PIV) – V_{RRM}	$V_s = \pi \cdot V_{DC}$	$2 \cdot V_s = \pi \cdot V_{DC}$	$V_s = \pi/2 \cdot V_{DC}$
Peak Direct Voltage (PDV – thyristors only) – V_{DRM}	$V_s = \pi \cdot V_{DC}$	$2 \cdot V_s = \pi \cdot V_{DC}$	$V_s = \pi/2 \cdot V_{DC}$
Diode Peak Forward Current – I_{FRM}	$\pi \cdot I_{DC}$	$\pi/2 \cdot I_{DC}$	$\pi/2 \cdot I_{DC}$
Diode Average Current – $I_{F(AV)}$	I_{DC}	$0.5 \cdot I_{DC}$	$0.5 \cdot I_{DC}$
Diode Rms Current – $I_{F(RMS)}$	$\pi/2 \cdot I_{DC}$	$\pi/4 \cdot I_{DC}$	$\pi/4 \cdot I_{DC}$
Fundamental Ripple Frequency – f_R	f_{mains}	$2 \cdot f_{mains}$	$2 \cdot f_{mains}$

Phy301-Solved papers with reference by Masoom fairy

Question No: 20 (Marks: 1) - Please choose one

Zener breakdown occurs

- ► Mostly in germanium junctions
- ► **Due to rupture of covalent bond**
- ► In lightly doped-junctions



► Due to thermally –generated minority carriers

In Zener Breakdown, the breakdown is initiated by the rupture of the bonds because of the existence of a strong electric field.

http://www.allinterview.com/showanswers/10620.html

Question No: 21 (Marks: 1) - Please choose one

The clipping level is primarily determined by

► Shape of the input waveform

► Battery voltage

► Value of the resistor

► **Knee voltage of the diode (PAGE 160)**

(2) Determine the applied voltage (Transition Voltage) that causes change in the diode bias.

Question No: 22 (Marks: 1) - Please choose one

Without a DC source a clipper acts like a

► **Rectifier**

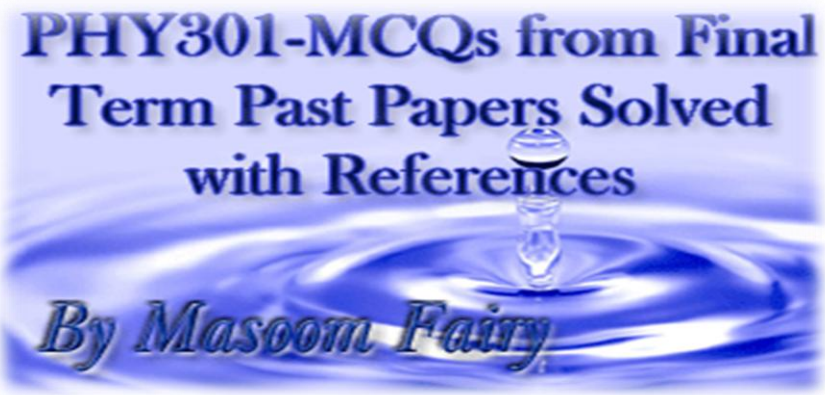
► Clamper

► Demodulator

► Chopper

http://ugcelectronics.blogspot.com/2012/05/electronic-science-solved-question_07.html

Question No: 23 (Marks: 1) - Please choose one



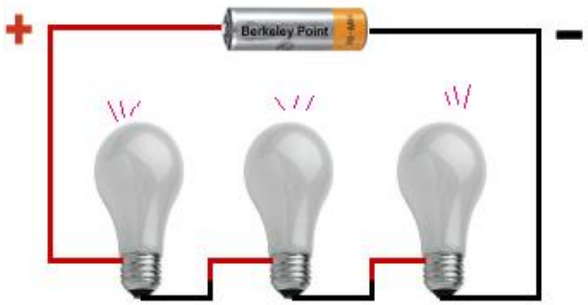
Avalanche breakdown is primarily dependent on the phenomenon of

- **► Collision**
- ► Doping
- ► Ionization
- ► Recombination

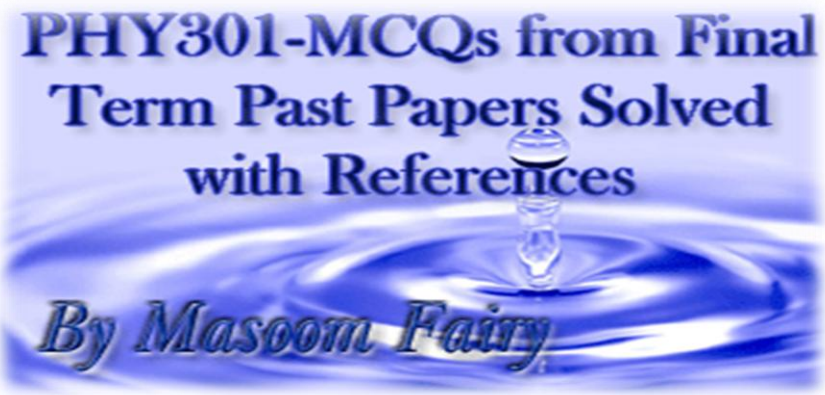
http://wiki.answers.com/Q/What_is_Avalanche_breakdown

Question No: 24 (Marks: 1) - Please choose one

Three bulbs are connected in series of a battery, what would happen if any one bulb is opened.



- ► half of current will flow
- ► same current will flow
- **► no current will flow**
- ► 2/3 current will flow



In a series circuit there is only one path for current to flow. The current will flow through each good lamp. If any lamp opens (blows), then the circuit is broken and current flow stops.

http://wiki.answers.com/Q/If_one_of_the_three_lamps_blows_out_when_connected_in_series_what_happens_to_the_current_in_the_other_two

Question No: 25 (Marks: 1) - Please choose one

The base region of a p-n-p transistor is

► **Very thin and heavily doped with holes**

► Very thin and heavily doped with electrons

► Very thin and lightly doped with holes

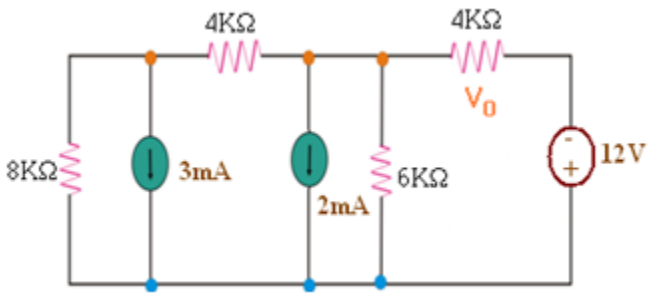
► Very thin and lightly doped with electrons

P-N-P Types
The operation of a p-n-p transistor is essentially identical to that of an n-p-n transistor except that the polarities of the bias voltages are reversed and the main current carriers are holes instead of electrons.

http://www.eteonline.com/npnpnp.html

Question No: 26 (Marks: 1) - Please choose one

Converting 12v voltage source into current source, value of converted current source source will be



► **3mA**

► 2mA

► 48mA

► 1mA

I = V/R => = 12/4 = 3mA

FINALTERM EXAMINATION

Fall 2009

PHY301- Circuit Theory (Session - 2)

Time: 120 min

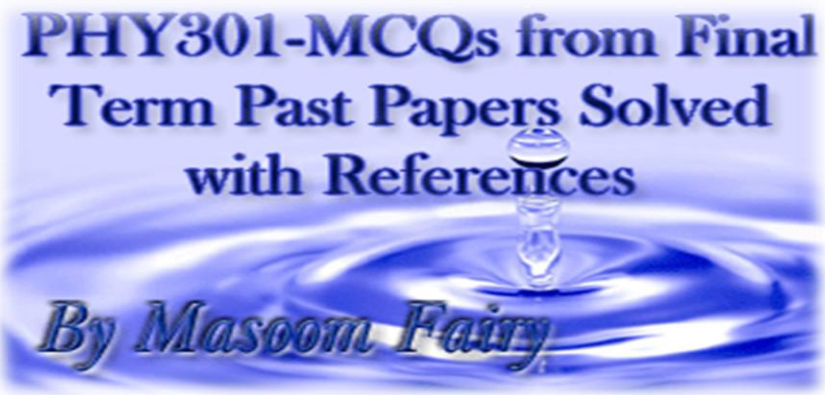
Marks: 70

Question No: 1 (Marks: 1) - Please choose one

Charge of 2c and 5c will

► attract each other

► **repel each other (PAGE 9)**



► no effect

► cancel each other

Question No: 2 (Marks: 1) - Please choose one

Which battery applies a greater potential difference?

► **12v (PAGE 8)**

► 1.5v

► 10v

► 0.5v

Question No: 3 (Marks: 1) - Please choose one

When one resistance in a series string is open

► The current is maximum in the normal resistances.

► **The current is zero in all resistances (Lecture 5 Topic: Voltage divider)**

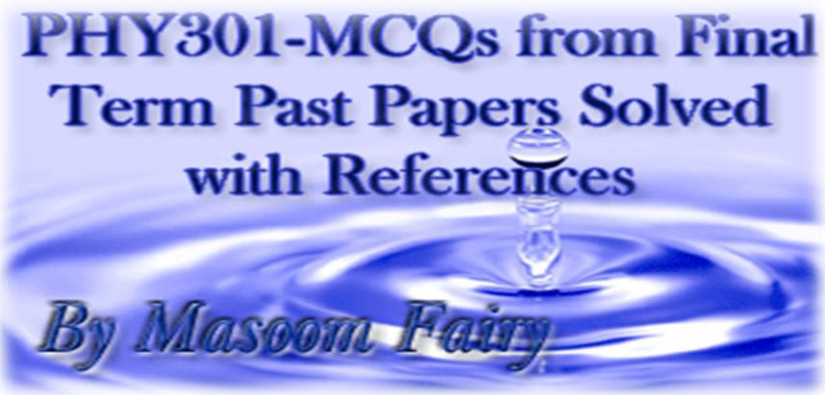
► The voltage is zero across the open resistance

► The current increases in voltage source

Reference: Series circuit is Voltage divider so the voltage will exist into the circuit and Current will become zero.

Question No: 4 (Marks: 1) - Please choose one

Addition of impurities in semiconductor material to produce more current is called



► **dopping (During Video Lecture 29)**

► bonding

► excitation

► intrinsic

Question No: 5 (Marks: 1) - Please choose one

For a P-N junction under farward bias

► **more farward current flows (PAGE 176)**

► no farward current flows

► more reverse current flows

► infinite reverse current flows

Question No: 6 (Marks: 1) - Please choose one

A diode is a

► **one way conductor (Lecture 30)**

► two way conductor

► three way conductor

► insulator

Question No: 7 (Marks: 1) - Please choose one

In farward biased Characteristics of junction diode, current value is

- ► i=ISe^V/V
- ► Is=ie^V/VT
- ► i=Ise^VT/V
- ► **i=Ise^V/VT (PAGE 129)**

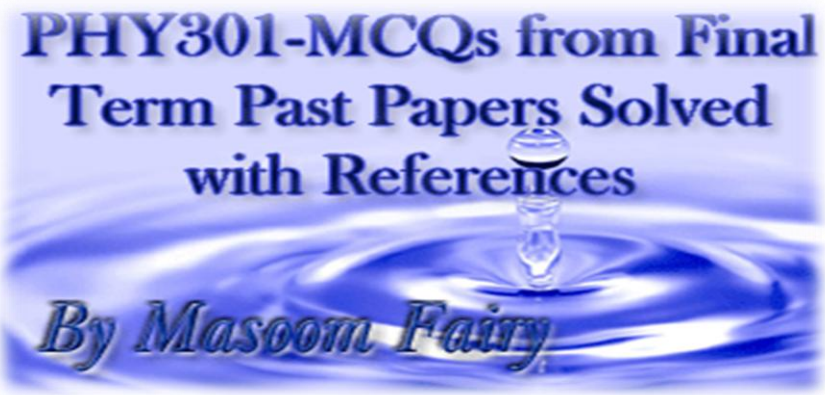
Question No: 8 (Marks: 1) - Please choose one

The primary and secondary winding of transformer are

- ► physically touched
- ► **physically isolated (PAGE 143)**
- ► touched with conductor
- ► largely separated

Question No: 9 (Marks: 1) - Please choose one

A certain transformer has 500 turns in the primary winding and 2500 turns in the secondary winding. The turn ratio is



► **0.5**

► 25

► 25v

► 2500

N2/N1 = 2500/500 = 5

Question No: 10 (Marks: 1) - Please choose one

A transformer will be out of phase when

► output voltage is 0 degree out of phase with input voltage

► **output voltage is 180 degree out of phase with input voltage (PAGE 146)**

► output voltage is 360 degree out of phase with input voltage

► output voltage is same as input voltage

Question No: 11 (Marks: 1) - Please choose one

If N denotes the total number of nodes, then number of nodal equations in nodal analysis will be

► **Number of equations=N-1 (PAGE 42)**

► Number of equations=N-1/2

► Number of equations=N

► Number of equations=N-2

Question No: 12 (Marks: 1) - Please choose one

Using superposition theorem, for a circuit containing independent sources, any remaining current source is

- ► replaced by capacitor
- ► replaced by short circuit
- ► **made zero by replacing them by open circuit (PAGE 92)**
- ► replaced by close circuit

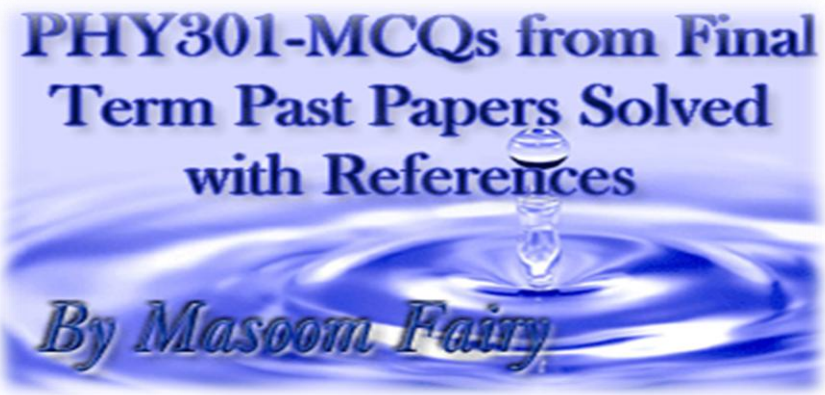
Question No: 13 (Marks: 1) - Please choose one

The PIV of a half wave rectifier circuit with a shunt capacitor filter is

- ► $2V_m$
- ► **V_m (PAGE 161 Repeated)**
- ► $V_m/2$
- ► $3V_m$

Question No: 14 (Marks: 1) - Please choose one

The primary function of a filter is to



► Minimize ac input variations

► Suppress odd harmonics in the rectifier output

► **Stabilize dc level of the output voltage**

► **Remove ripples from the rectified output (PAGE 159 Repeated)**

Question No: 15 (Marks: 1) - Please choose one

The base region of a p-n-p transistor is

► **Very thin and heavily doped with holes (REPEATED)**

► Very thin and heavily doped with electrons

► Very thin and lightly doped with holes

► Very thin and lightly doped with electrons

P-N-P Types

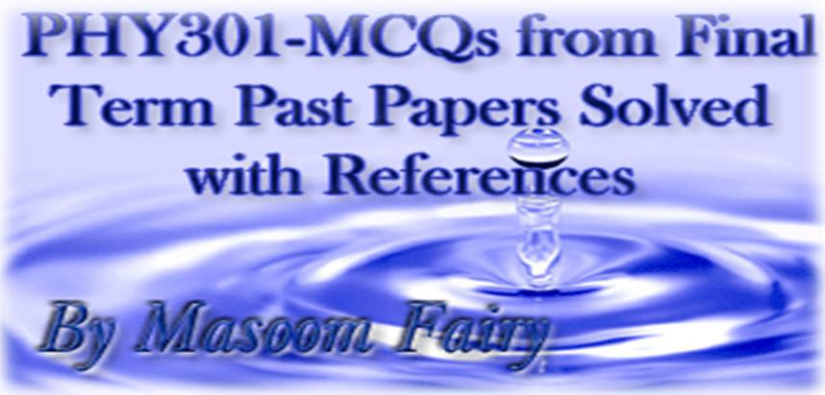
The operation of a p-n-p transistor is essentially identical to that of an n-p-n transistor except that the polarities of the bias voltages are reversed and the main current carriers are holes instead of electrons.

http://www.eteonline.com/npnpnp.html

Question No: 16 (Marks: 1) - Please choose one

Voltage multipliers are usually used in low current high voltage applications e.g

► Stabilizer of refrigerator



► Microcontroller

► **Cathode ray tube in television (PAGE 168)**

► Remote control

Question No: 17 (Marks: 1) - Please choose one

The current flow across the base-emitter junction of a p-n-p transistor consists of

► Mainly electrons

► Equal numbers of holes and electrons

► **Mainly holes**

► The leakage current

P-N-P Types

The operation of a p-n-p transistor is essentially identical to that of an n-p-n transistor except that the polarities of the bias voltages are reversed and the main current carriers are holes instead of electrons.

http://www.eteonline.com/npnpnp.html

Question No: 18 (Marks: 1) - Please choose one

In an P- type semicondutor material , the majority carriers are

► **holes (PAGE 122)**

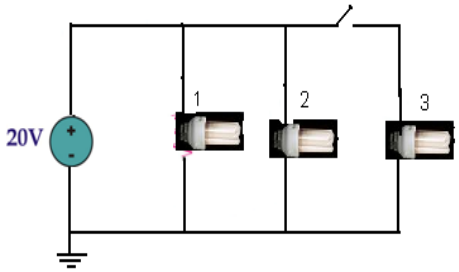
► electrons

► ions

► protons

Question No: 19 (Marks: 1) - Please choose one

Which light bulb will not glow in given circuit



►bulb 1 and 2

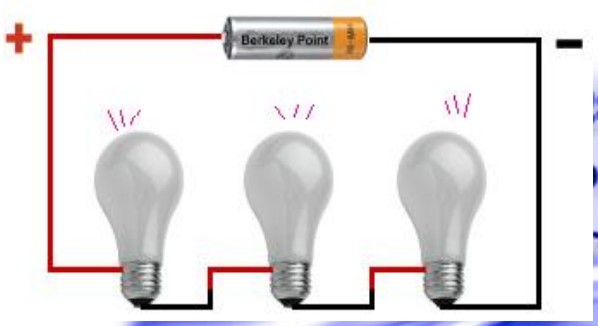
► all bulbs will not glow

► all bulbs will glow

► bulb 3

Question No: 20 (Marks: 1) - Please choose one

Three bulbs are connected in series of a battery, what would happen if any one bulb is opened.



s from Final
ers Solved
ences
By Masoom Fairy

► half of current will flow

► same current will flow

► **no current will flow (REPEATED)**

► 2/3 current will flow

In a series circuit there is only one path for current to flow. The current will flow through each good lamp. If any lamp opens (blows), then the circuit is broken and current flow stops.

http://wiki.answers.com/Q/If_one_of_the_three_lamps_blows_out_when_connected_in_series_what_happens_to_the_current_in_the_other_two

Question No: 21 (Marks: 1) - Please choose one

In normal operation an n-p-n transistor connected in common-base configuration has

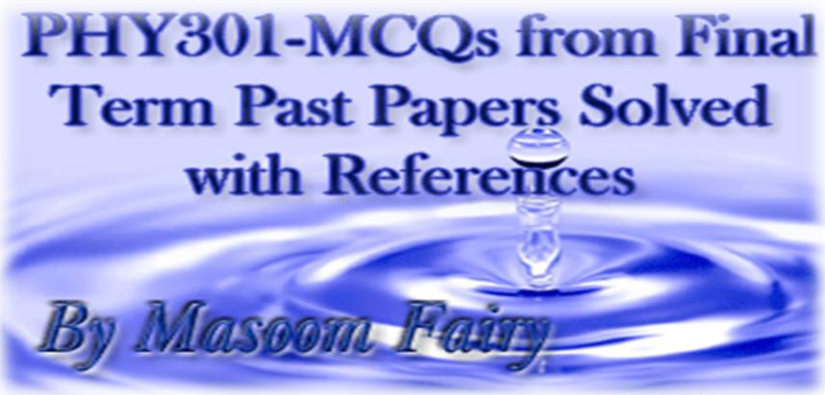
► The emitter at a lower potential than the base

► The collector at a lower potential than the base

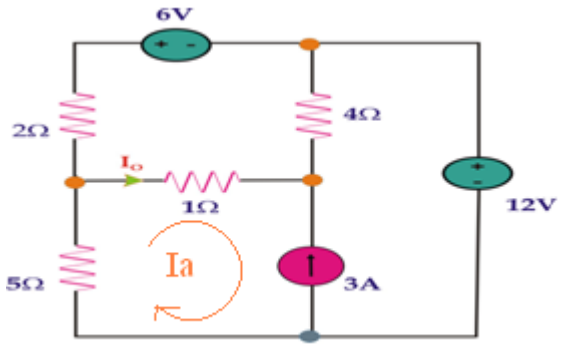
► **The base at a lower potential than the emitter (Not Conform)**

► The collector at a lower potential than the emitter

Question No: 22 (Marks: 1) - Please choose one



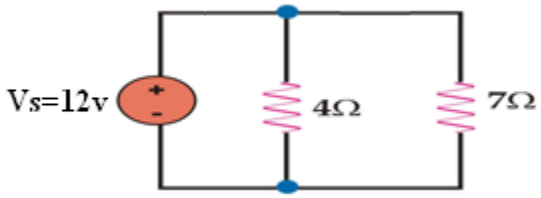
The value of Ia for given circuit is



- Ia=Io
- Ia= 3A
- **Ia= -3A (3A is in opposite direction)**
- Ia=6v

Question No: 23 (Marks: 1) - Please choose one

Across which resistance more voltage is dropped



- 4Ω

► 7Ω

► **same across both (PAGE 32)**

► no voltage drop

Any Series Circuit is Voltage divider and Parallel Circuit is Current divider.

Question No: 24 (Marks: 1) - Please choose one

When a diode is reversed biased

► It will act as short circuit

► **It will act as an open circuit (Video Lecture 30)**

► It will act as close circuit

► maximum current flows

FINALTERM EXAMINATION

Spring 2005

PHY301- Circuit Theory

For each question given below, encircle the option that in your opinion represents the best/ correct answer.

1)The resistance in a short circuit is

a) Large

b) small

c) Zero (PAGE 11)

d) None of the above

2) If one of the diode in a full -wave bridge rectifier is open, the out put is

a) 0V

b) One -fourth the amplitude of the input voltage

c) a half -wave rectified voltage

d) a 120 HZ voltage

3) The charge in motion is called

a) Voltage

b) current (PAGE 8)

c) intensity

d) Coulomb

4) The emitter current is always

a) Greater than base current

b) Less than collector current

c) Greater than collector current (PAGE 180)

d) Small than base current

5) In PNP transistor, the P-regions are

a) Base and emitter

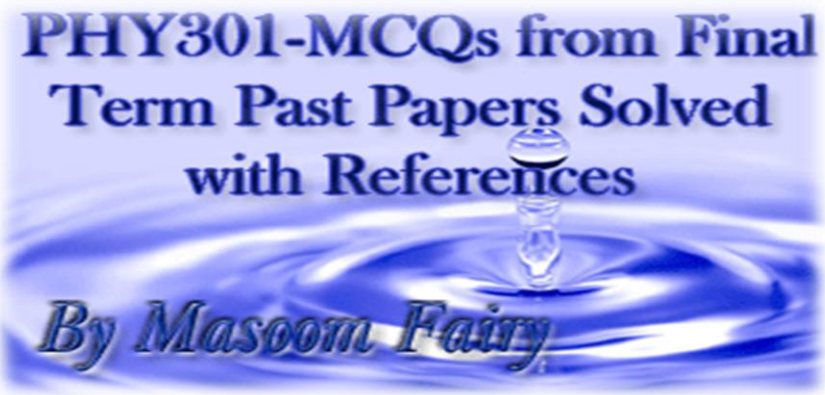
b) Base and collector

c) emitter and collector (PAGE 176)

d) All of the above

FINALTERM EXAMINATION

Spring 2011



PHY301- Circuit Theory

Leakage current of semiconductor diode is caused by [marks1]

- ► chemical energy
- ► heat energy
- ► barrier voltage
- ► **doping impurity**

Using superposition theorem, for a circuit containing independent sources, any remaining voltage source is [marks1]

- ► remain same
- ► made zero by replacing them by open circuit
- ► made zero by replacing them by capacitor
- ► **made zero by replacing them by short circuit (PAGE 92) Repeated**

The primary function of a filter is to [marks1]

- ► Minimize ac input variations
- ► Suppress odd harmonics in the rectifier output
- ► Stabilize dc level of the output voltage
- ► **Remove ripples from the rectified output (PAGE 159) Repeated**

The ripple factor of a bridge rectifier **[marks1]**

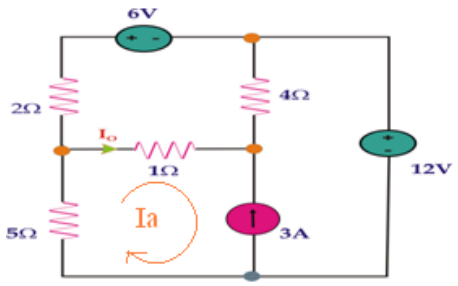
- ► 1.21
- ► **0.406 Repeated**
- ► 0.812
- ► **1.11**

Avalanche breakdown is primarily dependent on the phenomenon of **[marks1]**

- ► **Collision (Repeated)**
- ► Doping
- ► **Ionization**
- ► Recombination

http://wiki.answers.com/Q/What_is_Avalanche_breakdown

The value of Ia for given circuit is **[marks1]**



- ► Ia=Io
- ► Ia= 3A

► **Ia= -3A (3A is in opposite direction) Repeated**

► Ia=6v

When a diode is reversed biased **[marks1]**

► It will act as short circuit

► **It will act as an open circuit (Video Lecture 30)**

► It will act as close circuit

► maximum current flows

FINALTERM EXAMINATION

Spring 2004

PHY301- Circuit Theory

For each question given below, encircle the option that in your opinion represents the best/ correct answer.

I) Choose the correct term, an electronic device that is capable of storing a charge for a long time.
a) Transistor
b) Semi-conductor
c) Capacitor
d) Diode

II) The unit of electrical potential difference is
a) watt
b) Volt (PAGE 8)
c) ohm
d) ampere

III) Resistances R1 and R2 are in series with 90 V applied. If V1 is 30 V then V2 must be
a) 30 V
b) 90 V
c) 45 V
d) 60 V (PAGE 34)
Reference:
Vt = 90v => V1=30v
Vt-V1 = V2 => 90v – 30v = 60v

IV) In an N –type semiconductor materials, the majority carrier are
a) Holes
b) Electrons (PAGE 122)
c) Ions
d) Protons

V) When a current of 20 milliamps flows through a 50 ohm resistor the voltage drop across the resistor will be:
a) 100 mill volts
b) 10 mill volts
c) 1 volt
d) 10 volts

FINALTERM EXAMINATION

Spring 2003

PHY301- Circuit Theory

International system of units is built upon how many basic units.
o 8
o 9
o 10
o 7 (PAGE 1)

Absolute zero corresponds to
o 0oC
o 32oC
o 273K

o 0 K (PAGE 1)

Two unlike charges will
o Attract (PAGE 9)
o Repel
o Both attract and repel
o None of the above

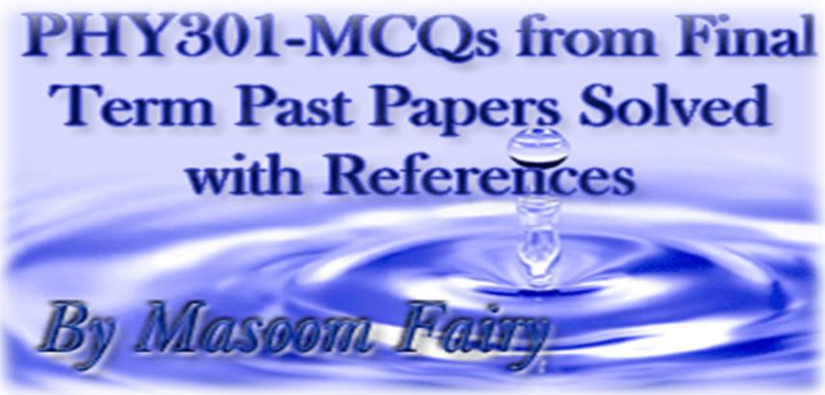
With zero potential difference across a wire, the current will be
o Maximum
o Depends upon the wire
o Zero (PAGE 9)
o None of the above

The opposition which limits the current is called
o Conductance
o Resistance (PAGE 10)
o Resistivity
o Conductivity

The process whereby charged particles move under the influence of electric field is called
o Current
o Voltage
o Drift (PAGE 121)
o None of the above

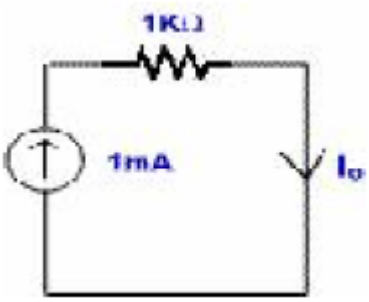
Phosphorus is a -------- element
o Pentavalent (PAGE 122)
o Trivalent
o Hexavalent
o None of the above

The current flows through the diode when it is reverse biased is called
o Leakage current
o Breakdown current
o Saturation current
o None of the above (According to definitions of all above options)



The resistance offered by the inductor is called
o Inductance (PAGE 19)
o Capacitance
o Resistivity
o None of the above

In the above circuit value of Io will be



o 2mA
o 1A (Current will be same in Series circuit)
o 2A
o 1mA

FINALTERM EXAMINATION

Spring 2006

PHY301- Circuit Theory

Superposition theorem can be applied only to circuit having …….. elements.

► Non-linear

► Passive

► Linear bilateral (PAGE 92)

► Resistive

The output of a half wave rectifier is suitable only for.....

► Running car diodes

► Charging batteries

► Diode rating

► Purity of power output

While calculating Rth current sources in the circuit are

► Replaced by opens (PAGE 100)

► Replaced indirect voltage

► Replaced by short

► Replaced DC voltage

In parallel circuits all components must

► have the same value
► have same potential difference (PAGE 34)

► carry the same current

► be switched ON & OFF simultaneously

The clipping level is primarily determined by

► shape of the input waveform

► value of the resistor

► battery voltage

► knee voltage of the diode (PAGE 160)

(2) Determine the applied voltage (Transition Voltage) that causes change in the diode bias.

The depletion region of a P-N junction is formed

► During the manufacturing

► When forward bias is applied to it (PAGE 123)

► Under reverse bias

► When its temperature is reduced

► None of the given

The dc load line of a transistor can be drawn if we know its cut off and ……. points

► active

► saturation

► quiescent

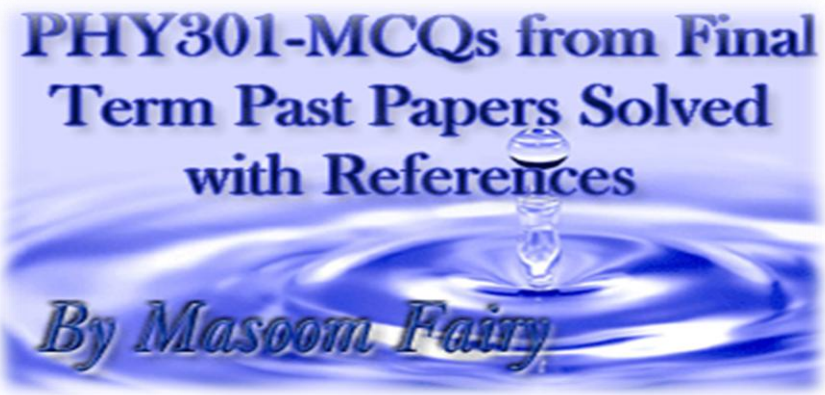
► None of them

Reference:

DC load line can be drawn onto these output characteristics curves to show all the possible operating points of the transistor from fully "ON" to fully "OFF".

http://www.electronics-tutorials.ws/amplifier/amp_2.html

The filter is simply a capacitor connected in ---------- with the load resistance.



► series

► **parallel (PAGE 159)**

► we can use it in series as well as in parallel

► none of them

Zener diode is operated in the ……. Region

► cut-off

► forward

► **breakdown**

► saturation

Zener diodes are a special type of semiconductor diode– devices that can be operated be operated continuously in that breakdown mode.

http://en.wikipedia.org/wiki/Zener_diode

A tunnel diode is always biased

► By dc source

► In the reverse direction

► In the middle of its negative resistance region

► **None of them**

رہی تعلیم مشرق میں، نہ مغرب میں رہی غیرت

یہ جتنے پڑھتے جاتے ہیں، جہالت بڑھتی جاتی ہے!

PHY301-MCQs from Final Term Past Papers Solved with References

By Masoom Fairy