

Subject: CS / IT / SE
Time Allowed: 2:30 Hour

Paper: Basic Electronics (PHY-2210)
Maximum Marks: 80

Note: Objective part is compulsory. Attempt any three questions from subjective part.

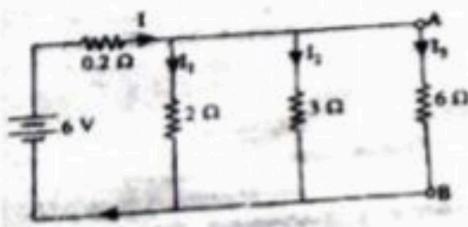
Objective Part

Q1. Write Short answer of the following on your answer sheet. (2*16=32)

- A. Define rectification? Name its types?
- B. Write the causes of Fiber losses?
- C. Can a transformer operate on DC?
- D. Define dielectric strength of a medium?
- E. What is Zener breakdown?
- F. What are passive circuit elements?
- G. What is the important feature of parallel circuits over series circuit?
- H. Find resistance value and tolerance rate of blue-white-gold-silver?
- I. What is the effect of temperature on barrier voltage?
- J. What are draw backs of ICS?
- K. What is ideal diode?
- L. Differentiate between linear and non-linear devices?
- M. What is the effect of doping on width of depletion layer?
- N. Why is Silicon preferred to Germanium for semi-conductor devices?
- O. What is the behavior of semi-conductor at zero degree Kelvin?
- P. Do pure semi-conductors obey Ohm's law?

Subjective: (3 * 16=48)

- Q2.** a). Describe the working of a potentiometer.
b) find the values of following questions with respect to given diagram
- I. Branch currents.
 - II. Current and power supplied by the battery
 - III. Current and power supplied by the battery if an accidental short occurs between points A and B.



- Q3.** a. Define transformer? Give principal and working of core type transformer?
b. A power transformer has 100 primary turns and 600 secondary turns. If the primary voltage is 120 Volt and full load primary current is 12 A. Find secondary voltage and secondary current?

Q4. Explain input and output characteristics of NPN transistor in CB configuration?

- Q5.** a. Define rectification? Explain half wave rectification with the help of single diode?
b. What is light emitting diode? Give its construction and working?

Q6. Define Fiber Optics? What is the structure of Optical Fibers? Also define the classification of Optical Fiber?

(2018)

(i)

Rectification:-

The process of converting A.C voltage into D.C voltage is called rectification.

Types .

Full-wave

Half wave.

Accomplished by

Rectifier, filters ,

Voltage Regulator.

(ii)

Causes of Fibre losses :-

- Material loss:- due to absorption of light by fibre material
- Light scattering :- Light is scattered by an obstruction, it produces power loss .
- Wavelength and Bend losses:-
 - Caused by imperfection and deformation of fibre structure which causes radiation of light away from fibre

(II)
No, transformer do not operate on D.C
It is device which step up or step
down the A.C without changing
secondary voltage.

(III).
Dielectric strength of Medium:-

→ Maximum voltage required to
produce the dielectric breakdown through
a material.

→ It is expressed as volts per
unit thickness.

(IV)

Passive Circuit element:-

It is electrical component that
does not generates power, but only
stores, dissipate and releases it

→ include capacitor resistor.

(V)

Importance of parallel circuit over series.

→ all component have same
voltage as source

→ Provide more than one way for
current to flow through device

→ Produces much more stable or
efficient power system

(Vii)
→ Zener Breakdown:-

It occur because of direct
rupture of covalent bond due to high
electric field across junction

- Occurs for heavily doped device
Depletion region is narrow.

(Viii)

Effect of temperature on barrier voltage.

Barrier voltage is inversely proportional
to temperature,

As temperature increases, value of potential
barrier is decreasing.

Barrier voltage has higher value when
temp is at 300K.

(IX)

Drawbacks of ICS :-

- coils and inductor cannot be fabricated.
- ICS functions at fairly low voltage.
- They can handle on limited amount
of power.

(Xii)

Ideal diode:-

An ideal diode is kind of an electrical component that performs

- like conductor when voltage is applied in forward bias
- like insulator when voltage is applied in reverse bias.

(Xiii)

Linear

→ Are those whose V/I characteristic is straight line

→ devices are resistor, capacitor.

→ Drive low current

Non Linear

→ In which V and I are not directly proportional to each other.

→ Semiconductor, transistor

→ derive high current

XIV
(ix)

Effect of doping on width of depletion.

→ Width of depletion region in a p-n junction diode is inversely proportional to doping concentration of p- and n sides.

→ As doping increases, depletion region width narrows.

(Kv)

→ Why silicon referred to germinium

→ Silicon can be worked at higher temperature as compared to germinium

→ Silicon must have much smaller leakage current than that of germinium.

(x)

A OK:-

At 0°K there are one electron in conduction band of semiconductor and their valence band is completely filled. It means that at absolute zero temperature, a piece of Ge and Si acts like a perfect insulator.

In other words, temperature of semiconductor increases.

(KNii)

Pure semiconductor does not obey ohm's law. It works on non-linear property.