



# Foundation University

## Rawalpindi Campus

### Midterm Examination (Fall-2017)

Program: BCSE

Semester: 1<sup>st</sup>

Course Title: Physics

Section: A, B, C, D

Total Time: 1.5 Hours

Max. Marks: 25

Instructor Name: M. Hafeez Javed

Date:-

- Be precise to the answers, do not write anything irrelevant in the paper it will be credited as negative.
- This is a Written exam, so instructor will judge what is WRITTEN, not that which you KNOW.
- Understanding the question paper is a part of Examination, Paper will not be discussed during exam.
- Do Not Write anything on Question paper and do not return it back with the answer sheet.

Q. No 1: Differentiate the terms

I. Ampere and Volt

[Amount of Current passing through a cross section are will be measured in amperes, while Volt is the unit to measure the potential difference or Electric potential ]

II. E. Potential and Resistance

Electric potential is the Energy of a Charge to do work and Resistance is the opposition to flow of charge or electron]

III. Drifting and Diffusion

Transfer of charge with the help of Electric Field is known as Drifting and transfer due to concentration difference is known as diffusion]

IV. P type and N type?

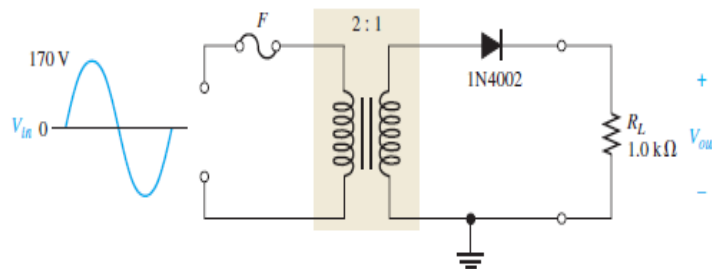
[p type is a semiconductor material doped with trivalent and contain positive charge while N type is doped with Pentavalent and contains free electrons]

V. Ohms law states that  $V=IR$  what are the physical condition for this law?

(1+1+1+1+1)

[Temperature remains constant]

Q.No 2 Analyze what is being represented by the Following Circuit, what will be its output waveform, What is the average value of the voltage. (1+2+2)



It is a Half wave rectifier with a step down transformer s

Draw half wave

85/3.147

Q. No 3. Carrier generation is very essential for Semiconductors to conduct, keeping in view explain Methods of Carrier generation, their types? (1+2+2)

**Excitation and Doping**

**P N type**

Q. No4. a). Differentiate the three Fundamental Electronic materials on behalf of Energy band theory (3)

b). Draw IV curve for PN Junction and analyze it? (2)

**Graphs are given in Slide**

Q. No5:- Calculate the built-in potential barrier of a pn junction. Consider a silicon pn junction at  $T = 500 \text{ K}$ , doped  $N_a = 10^{16} \text{ cm}^{-3}$  in the p-region,  $N_d = 10^{17} \text{ cm}^{-3}$  in the n-region and  $n_i = 1.5 \times 10^{10} \text{ cm}^{-3}$ ,

where  $k = 86 \times 10^{-6}$ ? (2+3)

**Already Solved in Class**

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☺Good Luck☺

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HOD DSE

INSTRUCTOR