EASTERN UNIVERSITY, SRI LANKA

SECOND EXAMINATION IN SCIENCE – 2013/2014

FIRST SEMESTER (February/March 2016)

PH 202 ELECTRONICS - I

e: 01 hour

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a) Explain depletion layer and the diode action at forward and reverse bias.
b) Briefly describe three applications of diodes and their uses.
c) Explain the function of a zener diode through a schematic sketch of I-V characteristics.

The circuit shown in figure 1 is designed with two zener diodes (voltage 6 V, maximum current 6 mA) and a load resistance of 1.5 kΩ. Find,

i. the current through the zener diode,
ii. the power dissipated by both diodes.

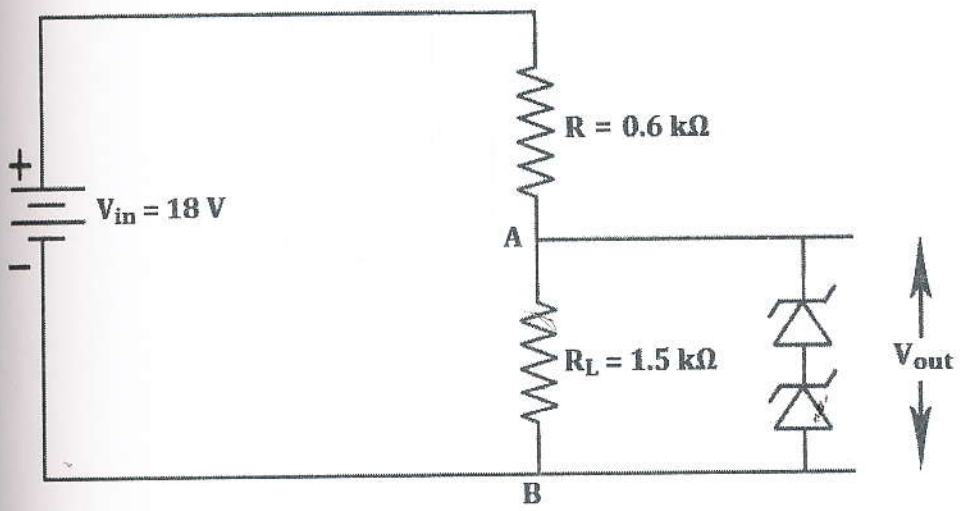

Figure 1

Q2.

a) Briefly explain the action of an n-p-n bipolar junction transis
b) Sketch the transfer characteristics of a bipolar junction identifying the active, saturation and cut-off regions, an functions in these regions.

Figure 2 shows an n-p-n transistor operating in the activ common-emitter configuration with following parameters.

$V_{cc} = 24\ V$, $R_1 = 75\ k\Omega$, $R_2 = 20\ k\Omega$, $R_3 = 60\ k\Omega$
$V_{BE} = 0.7\ V$, $R_C = 20\ k\Omega$, $R_E = 5\ k\Omega$, $c = 0.1\ \mu F$,

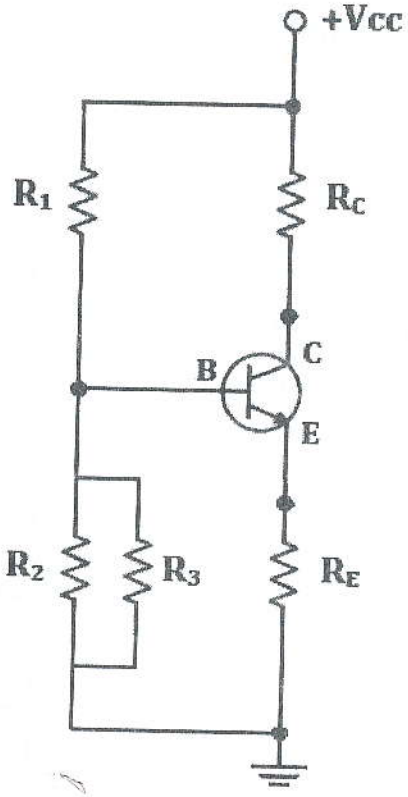

Figure 2

For the above circuit,

i. Calculate the collector current,
ii. Find the percentage of change in collector curren transistor with $\beta = 150$ is replaced.