PHY301 Circuit Theory

Final Term Examination - July 2003
Session -1

TIME ALLOWED: 150 Minutes   TOTAL MARKS: 66

Please read the following instructions carefully before attempting any of the questions:

a. All questions are compulsory.
b. This exam consists of **10** Multiple Choice Questions (MCQ's); one question is for filling in the blanks which carries 20 Marks and three descriptive questions.
c. Each MCQ carries 1 Marks.
d. Fill in the blanks question carries **20** Marks.
e. While attempting descriptive question do not miss any step so that you could get better marks.
f. You can type the answer of descriptive question in Ms Word and then copy it in the software provided to you by the Virtual University. All the figures and formats should also be made in the Ms Word and then be copied in the provided software. For figures you can use MS PAINT.
g. When you have copied your answer in the software. Do not worry if it's format changes.
h. Save your answer before proceeding to the next question.
i. Do not ask about the contents of any question of this examination from anyone.
j. If you think that there is something wrong with any of the questions, attempt it to the best of your understanding.
k. On the other hand, if you believe that all of the choices provided for a particular question are the wrong ones, select the one that appears to you as being the least wrong.
l. Do not click the "Finish" button" while solving your paper. Once you clicked the "finish" button, you will not be able to access your paper again. Click it at the end of your paper. That means you have submitted your complete paper.

Total Questions 14

Q.No 1
International system of units is built upon how many basic units.
- o 8
- o 9
- o 10
- o 7

Q.No 2
Absolute zero corresponds to
- o 0oC
- o 32oC
- o 273K
- o 0K

Q.No 3
Two unlike charges will
- o Attract
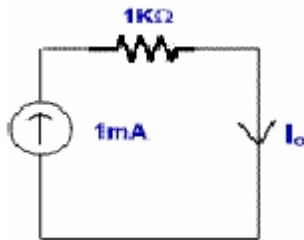- o Repel
- o None of the above

Q.No 4

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

Q.No 5

The opposition which limits the current is called
- o Conductance
- o Resistance
- o Resistivity
- o Conductivity

Q.No 6

In the above circuit value of Io will be
- o 2mA
- o 1A
- o 2A
- o 1mA

Q.No 7

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

Q.No 8

Phosphorus is a -------- element
- o Pentavalent
- o Trivalent
- o Hexavalent
- o None of the above

Q.No 9

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

Q.No 10

The resistance offered by the inductor is called
- o Inductance
- o Capacitance
- o Resistivity
- o None of the above

## Q.No 11

Fill in the blanks.

All questions carry 2 marks each
- (i) Mole is a unit of ------------
- (ii) 1 Mega Ohm is equal to ----------- ohms.
- (iii) Hydrogen has an atomic no ---------------.
- (iv) Electron valance is the no of electron in the incomplete -------- shell.
- (v) The voltage drop across a short circuit is --------- .
- (vi) The current that results from the diffusion of charged particles is called ------- current.
- (vii) Doped silicon in which majority of charge carriers are negatively charged electrons is called ---------- type.
- (viii) The windings of transformer connected to the load is called ---------windings.
- (ix) One diode can be used as a ------- wave rectifier.
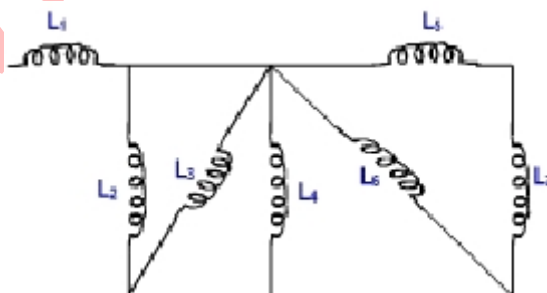- (x) Analyze the following circuit
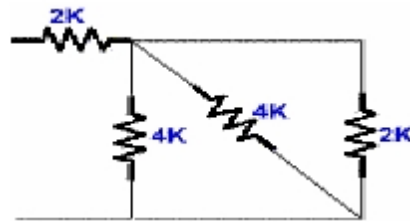
Req = --------------.

Q.No 12

Carry out analysis of the circuit to calculate voltage at all nodes and current through all branches. Please show all steps for the calculation.   **[20]**
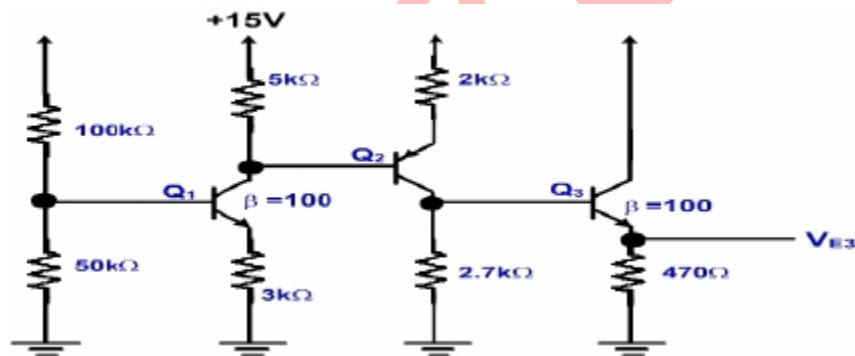
Q.No 13

(a) Find the resultant inductance of the circuit. Please show all steps for the calculation.
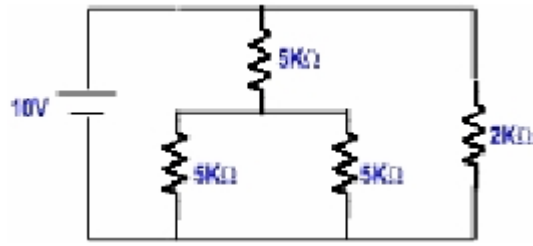

(b) Define the following sources   **[4]**
- (i) Independent voltage source.
- (ii) Voltage dependent current source.

Q.No 14

Calculate the current through the circuit. Please show all steps for the calculation.
[10]