Kafrelsheikh University		Date : 28-6-2021
Faculty of Engineering		Time Allowed: 3 hr.
Department: Electrical Power and Machines		Full Mark : 70 Marks.
Year : 3rd year , 2020-2021		Midterm Exam: Two pages
Subject: High Voltage Engineering		Academic Code: EPM 3112

Answer the Following Questions:

1- All the questions according to ILOs a 1, a 3, b2, b 6, b14, b15, b18, b20, c3, c10, c11, c15.
2- Number of pages :2 No. of questions : 3
3- The weight of each problem is indicated.
4- This a closed book exam **" allowable the arrester catalogue tables".**
5- Clear, systematic answers and solutions are required in general, marks will not be assigned for answers and solutions that require unreasonable (in the opinion of the instructor) effort to decipher.
6- Ask for clarification if any question statement is not clear to you.
7- Attempts in all questions.
8- The exam will be marked out of 70.

Question (1): (30 Marks)

a   Explain how can generate DC Voltage higher than doubler circuit ?   10

b   How can generate the impulse currents?   5

c   The total voltage ripple of a Cock-Walton type voltage multiplier is   15

10 kV at a supply frequency of 100 Hz. If the load current is 1.25mA

and the circuit capacitance is 0.045 µF, calculate:

   1- The number of stages

   2- The percentage ripple

   3- The maximum secondary voltage of the supply

   4- The total voltage drop and the regulation

Assume that: The optimum number of stages for minimum voltage

drop is 16 stages.

Question (2): (15 Marks)

a   How can overcome the drawbacks of measuring the DC High   5
voltages in AC voltages " state the drawbacks and overcome
methods"?

1

| b | For a series impedance of 150 kΩ resistance, 700mH and 20nF residual inductance and capacitance respectively, the ammeter reading is 90 mA at a frequency of 50Hz. Calculate the error arose when neglecting both the residual capacitance and the residual inductance. | 10 |

Question (3):   (25 Marks)

| a | What are the types of the overvoltage protection devices? | 5 |
| b | Design with all verifications the arrester with the new technique for Egyptian Unified Grid "E. U. G" for 400 kV line voltages. Use the accompanied tables for the old and new design. (Take V_a=0.8 V_m). | 20 |

(يسمح للطلاب بدخول جداول التيار مانعات الصواعق)