

Kafr Elshiekh University

Faculty of Engineering

Department: Electrical Power and Machines

Year : 3rd year , 2017-2018

Subject: High Voltage Engineering



Date: 23-5-2018

Time Allowed: 3 hr.

Full Mark: 90 Marks.

Midterm Exam: Two pages

Academic Code: EPM 3112

Answer the Following Questions:

- 1- All the questions according to ILOs a1, a3,b2, b6, 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 90.

Question (1):

(30 Marks)

- a State; the methods to generate multiple of input voltage of AC and DC systems. 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 μ F, 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):

(25Marks)

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

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methods"?

For a series impedance of $150\text{ k}\Omega$ 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.

15

Question (3):

(35 Marks)

a What are the lightning different damaging effects? 10

b Design with all verifications the arrester with the new technique for 25

Egyptian Unified Grid "E. U. G" for 400 kV line voltages. Use the accompanied tables for the old and new design. (Take $V_a=0.8\text{ Vm}$).

Good Luck

Dr. Fathalla selim and committee

