Registration no: | | | | | | | | | | |

Total Number of Pages: 01 **M.TECH**
PSPC201

2nd Semester Back Examination 2016-17
POWER SYSTEM TRANSIENTS
BRANCH(S): POWER AND ENERGY ENGG, POWER ENGG AND ENERGY SYSTEMS
Time: 3 Hours
Max Marks: 70
Q.CODE: Z466
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions:** (2 x 10)

a) What are the main reasons for transient?
b) What is TRV and RRRV?
c) What do you understand by stepped leader?
d) What is keraunic level and isokeraunic level?
e) What is Critical Flashover Voltage?
f) What is circuit thumbprints?
g) What is Duhamel's Integral?
h) What is the meaning of reflection coefficient and transmission coefficient?
i) What is the reason for attenuation and distortion of waves?
j) What do you mean by surge suppression?

Q2 a) Derive the travelling wave equation in a long transmission line. (5)
b) How would you differentiate between switching, lightning and temporary over voltages? (5)

Q3 Explain the phenomena of multiple restrike of circuit breaker in respect to capacitance switching. (10)

Q4 What is Inrush phenomena in transformer? How does it occur? What transients would be seen at the terminals of the transformer when this would occur? Explain with an example. (10)

Q5 a) What is double frequency transient? Explain the phenomena of double frequency transient by giving a suitable example. (5)
b) The alternator of 15 KV system has a three phase short circuit capacity of 25 kA at its terminal. What would be the maximum voltage at the capacitor terminals after the switch between the generator and capacitor load is switched on? The capacity of the capacitor can be assumed to be 5 MVA. (5)

Q6 a) What will be the equation of current in R-L series transient when it is excited by a signal $V_m \sin(\omega t+\varphi)$? (5)
b) Explain the phenomena and working of lightning arrestors. (5)

Q7 What is the phenomena of charge formation in clouds? Explain the phenomena of formation with example? (10)

Q8 **Explain any two** (5 x 2)

a) Ferroresonance
b) Mathematical modeling of Lightning
c) Testing scheme of insulators
d) Transients in SLG fault