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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
TEST-1 EXAMINATION FEBRUARY 2019

COURSE CODE: 10B1WEC611

MAX. MARKS: 15

COURSE NAME: POWER ELECTRONICS

COURSE CREDITS: 4

MAX. TIME: 1HR

*Note: All questions are compulsory. Carrying mobile phone during examinations will be treated as a case of unfair means. All questions carry equal marks.*

1. Explain the switching characteristics of a Power BJT. How can we reduce the turn-on time and turn-off time of BJT to use it in high frequency applications?
2. Write-down the advantages and disadvantages of GTO over SCR. Explain the turn-off process of GTO with its two-transistor model.
3. For an SCR, the gate-cathode characteristic is given by a straight line with a gradient of 20 volts per ampere passing through origin. The maximum turn-on time is  $4 \mu\text{s}$  and the minimum gate current required to quick turn-on is 400 mA. If the gate source voltage is 15V, calculate the resistance to be connected in series and gate-power dissipation. Given that pulse width is equal to the turn-on time and the average power dissipation is 0.2W, compute the maximum triggering frequency that will be possible when pulse firing is used.