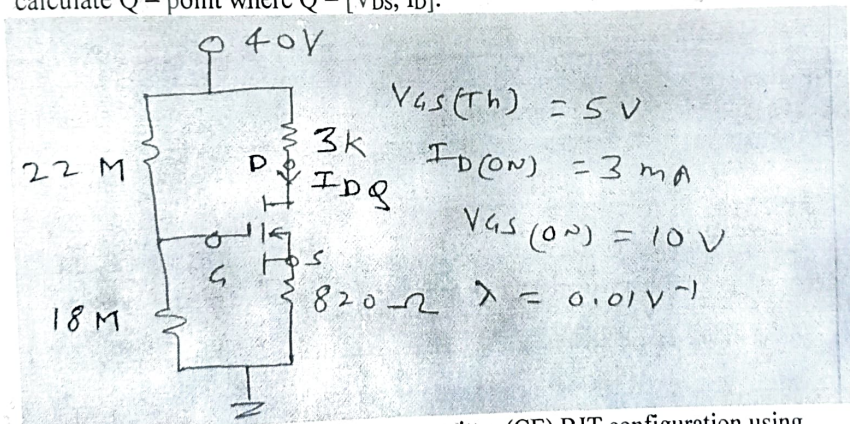


- N.B. : (1) Question No 1 is Compulsory.
 (2) Attempt any three questions out of the remaining five.
 (3) All questions carry equal marks.
 (4) Assume suitable data, if required and state it clearly.

1 Attempt any FOUR

[20]

- a Explain the reverse bias mode of operation of the P-N junction diode with neat sketch.
 - b Explain the operation of the photo diode with neat sketch.
 - c Compare or differentiate between clipper & clamper circuits.
 - d Derive an expression for the ripple factor (γ) of a full wave bridge type rectifier.
 - e Explain the operation of inductor (L) type filter with neat sketch.
- 2 a Describe the working or operation of a center-tapped type full wave rectifier with a neat sketch. Draw the input voltage & output voltage waveforms. [10]
 - b For any full wave rectifier, derive the output voltage expressions for AC output voltage (V_{rms}) & DC or average (V_{dc}) output voltage. [10]
 - 3 a With appropriate mathematical analysis, explain the effect of temperature on the P-N junction diode V-I characteristics. [10]
 - b Explain with the help of neat diagram explain the working of light emitting diode (LED). [10]
 - 4 a Compare Zener breakdown & avalanche breakdown. Describe the reverse bias characteristics of Zener diode with neat sketch. [10]
 - b What are memristors ? Explain the operating principle, construction & working of memristors with a neat sketch. [10]
 - 5 a Compare different biasing circuits of a bipolar junction transistor (BJT). [10]
 - b Draw circuit diagram and explain the operation of different biasing circuits used for D-MOSFET. [10]
 - 6 a For the voltage divider bias circuit shown below using N-channel E-MOSFET calculate Q - point where $Q = [V_{DS}, I_D]$. [10]



- b For small signal amplifier in common emitter (CE) BJT configuration using voltage divider biasing perform small signal (AC) analysis using the hybrid - π model. [10]
