1) Transformer oil having a dielectric constant of 2.2 and a dielectric strength of 25 kV/mm, is used as an insulation of spacing 8 mm. **Determine** the maximum applicable voltage. A barrier of thickness 3 mm of transformer board with a dielectric strength of 50 kV/mm, dielectric constant of 4.4 is used in this space to increase the strength. **Does** the transformer board serve this purpose in this case?

2) In an experiment for determining the breakdown strength of transformer oil, the following observations were made. **Determine** the power law dependence between the gap spacing and the applied voltage of the oil.

Gap spacing (mm):	4	6	10	12
Voltage at breakdown(kV):	90	140	210	255

3) A solid specimen of dielectric has a dielectric constant of 4.2, and tan δ as 0.001 at a frequency of 50 Hz. If it is subjected to an alternating field of 50 kV/cm, **Calculate** the heat generated in the specimen due to the dielectric loss.

4) A solid dielectric specimen of dielectric constant of 4.0, has an internal void of thickness 1 mm. The specimen is 1 cm thick and is subjected to a voltage of 80 kV (rms). If the void is filled with air and if the breakdown strength of air can be taken as 30 k V (peak)/cm, **Find** the voltage at which an internal discharge can occur.

5) **What** is "thermal breakdown" in solid dielectrics, and how is it practically more significant than other mechanisms?

6) **Explain** the different mechanisms by which breakdown occurs in solid dielectrics in practice. Then discuss how does the "internal discharge" phenomena lead to breakdown in solid dielectrics?

7) **What** are the demerits of liquids with solid impurities?

8) **Mention** the different recommendations and requirements which required during testing transformer oil for dielectric strength, and then **mention** the accepted value of dielectric strength for transformer oil?

9) **Mention** the different factors which affecting on the BDV for insulating Gases, liquids, and solids?