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Reg. No. : .....

Name : .....

Fourth Semester B.Tech. Degree Examination, May 2013
(2008 Scheme)
Branch : Electrical & Electronics
08.405 : ENGINEERING MATERIALS SCIENCE (E)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions. **All** questions carry **4** marks **each**.

1. Define Townsends first ionization co-efficient. How is the condition for breakdown obtained in a Townsend discharge ?
2. Explain the term 'electron attachment'. Why are electron attaching gases useful for practical use as insulators when compared to non attaching gases ?
3. Mention the phenomena of 'photo electric emission'.
4. Briefly explain the electric discharge in gases.
5. Explain 'Bubble theory' for breakdown of a pure liquid.
6. Discuss the desirable properties of a transformer oil. Why the treatment of a transformer oil is needed ?
7. Mention the properties and applications of paper and plastics.
8. Explain the properties of a paramagnetic material.
9. Write a note on HRC catridge fuse.
10. What do you mean by 'super conductivity' ? **(4×10=40 Marks)**

P.T.O.

PART – B

Answer **any one** full question from **each** Module. **Each** question carries **20** marks.

Module – I

11. a) Mention the processes that help to sustain the discharge on gaseous dielectrics.
    b) What is Paschen's law ? Explain the Streamer theory of breakdown in gases.

OR

12. a) Discuss the various mechanisms of vacuum breakdown.
    b) Briefly explain the production, properties and applications of SF_6 gas as the insulating material.

Module – II

13. a) Explain 'Electronic breakdown theory' in pure liquids.
    b) Explain with neat diagrams the treatment and testing of transformer oil.

OR

14. a) Explain the following as related to solid dielectrics.
        i) Intrinsic breakdown
        ii) Electromechanical breakdown
        iii) Breakdown by 'treeing' and 'tracking'.
    b) What are the properties of polyethylene, cross-linking polyethylene and poly propylene films ?

Module – III

15. a) Distinguish between hard and soft magnetic material with examples.
    b) Explain the following :
        i) Ferri magnetism
        ii) Magnetic anisotrophy
        iii) Magneto striction.

OR

16. a) Discuss the properties of Nickel, Molybdeum and Tungsten used as material for resistors.
    b) What do you mean by annealing ? Also explain the properties of grain oriented steel.

(20×3=60 Marks)