B.TECH. DEGREE EXAMINATIONS: OCTOBER / NOVEMBER-2008

Second Semester

U07PH205: PHYSICS-II

TEXTILE TECHNOLOGY

Time: Three Hours   Maximum marks: 100

PART A (20 x 1 = 20 Marks)
Answer ALL Questions:-

1. The unit of mobility is
   A. m / V s   B. m^2 / V s
   C. m^3 / V s   D. m^4 / V s

2. Fermi level is the upper most occupied energy level in a conductor at

   A. 0K   B. 10K
   C. 100K   D. 1000K

3. The expulsion of magnetic field from the interior of superconductor is called

   A. Raman effect   B. Silsbee effect
   C. Compton effect   D. Meissner effect

4. SQUIDs are highly sensitive

   A. electrometers   B. barometer
   C. magnetometers   D. logic elements

5. At 0K, semiconductors behaves as perfect

   A. conductors   B. semi conductors
   C. insulators   D. magnets

6. When an electron combines with a hole, it becomes a

   A. proton   B. valence electron
   C. hole   D. phonon

7. At very high doping level, extrinsic semiconductors are called

   A. super conductors   B. insulators
   C. semimetals   D. dielectrics

8. Semiconductors doped with trivalent impurities are known as

   A. P – type semiconductors   B. N– type semiconductors
   C. direct band gap semiconductors D. Both A & B

9. Diamagnetic materials exhibit

   A. a strong positive susceptibility   B. a strong negative susceptibility
   C. a weak negative susceptibility   D. a weak positive susceptibility

10. One Bohr magneton equals

A. 9.27×10^{-24} A m
B. 9.27×10^{-24} A^2 m
C. 9.27×10^{-24} A / m^2
D. 9.27×10^{-24} A m^2

11. Dielectric material possess high electrical

A. conductivity
B. resistivity
C. susceptibility
D. coercivity

12. Clausius- Mosotti equation is valid for

A. polar solids having cubic crystal structure
B. non polar solids having hexagonal crystal structure
C. non polar solids having cubic crystal structure
D. Both A & B

13. The glass transition temperature for metallic alloys is about

A. 5° to 10° C
B. 5° to 100° C
C. 10° C to 100° C
D. 20° to 30° C

14. Ceramic materials consist of phases which are compounds of

A. metals
B. non-metals
C. metals & non – metals
D. rubber

15. Ceramic materials have------- tensile strength.

A. very low
B. very high
C. moderate
D. low

16. The following is an example for shape memory alloy

A. Ni-Ti alloy
B. Gallium Phosphide
C. Al_2O_3
D. Be O

17. The frequency range used for blood flow studies in ultrasonic technique is

A. 10 – 15 M Hz
B. 100 – 150 M Hz
C. 1000 – 1500 M Hz
D. 5-10 M Hz

18. Phonocardiography deals with the

A. graphic recording of brain activity
B. graphic recording of liver activity
C. graphic recording of heart sounds
D. graphic recording of pancreas activity

19. Acoustic impedance of a medium is the product of

A. density of the medium and velocity of light in the medium
B. density of the medium and ultrasonic wave velocity in the medium
C. density of the medium and infrasonic wave velocity in the medium
D. density of the medium and X-rays velocity in the medium

20. Technetium 99m emits only

    A.   beta rays only   B.   gamma rays only
    C.   alpha rays only   D.   both B & C

Part B (5 X 16 = 80 Marks)

21.(a) Obtain a general expression for the Fermi energy of electrons in solids at 0K. show that at the same temperature the average energy of electrons is 3/5 of Fermi energy. (16)

(OR)

21.(b) (i)Describe Type-I and Type-II superconductors with examples. (6)

        (ii)Discuss any five applications of superconductors (10)

22. (a) Obtain an expression for carrier concentration in an intrinsic semiconductor. (16)

(OR)

22. (b) (i)What is Hall effect? Derive an expression for Hall coefficient. (10)
        (ii)Describe an experimental setup for the measurement of
           Hall coefficient. (6)

23. (a) (i)Explain the hysteresis curve on the basis of domain theory. (10)
        (ii)Distinguish between hard and soft magnetic materials. (6)

(OR)

23. (b) (i)What is meant by local field in a dielectric and how it is
           calculated for a cubic structure? (10)
        (ii)Discuss any two dielectric breakdown mechanisms. (6)

24. (a) (i)Discuss the properties and uses of metallic glasses. (10)
        (ii)List out the important applications of shape memory alloys. (6)

(OR)

24. (b) (i)Describe the slip casting ceramic forming processes. (10)
        (ii)Give the thermal and mechanical properties of ceramics. (6)

25.(a) (i)Discuss the different types of ultrasonic scanning methods. (12)
        (ii)Mention the applications of phonocardiography. (4)

(OR)

25.(b) (i)Explain the method of obtaining nuclear image of an organ
          of our body using gamma camera. (12)
        (ii)Mention any four radio isotopes along with their applications. (4)

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