STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.

(For candidates admitted during the academic year 2004-05 & thereafter)

SUBJECT CODE : **PH/AO/FP33**

B.Sc. DEGREE EXAMINATION NOVEMBER 2008

BRANCH IV – CHEMISTRY

THIRD SEMESTER

REG. No._____

COURSE : **ALLIED – OPTIONAL**

PAPER : **FUNDAMENTALS OF PHYSICS**

TIME : **30 MINS.** MAX. MARKS : 30

SECTION – A

TO BE ANSWERED IN THE QUESTION PAPER ITSELF

ANSWER ALL QUESTIONS: **(30 x 1 = 30)**

I CHOOSE THE CORRECT ANSWER:

1. The M.K.S. unit of Rigidity modulus is _____.
   a) N/m b) N/m^2 c) Nm d) N

2. The total work done per unit volume is _____
   a) shearing stress b) force c) ½ stress X strain d) none

3. Surface free energy can be expressed in _____.
   a) Jm^{-2} b) Nm^{-1} c) joules d) ergs

4. If the atom is initially in the upper state E_2 it can drop to E_1 by emitting a photon of energy $h\gamma$ this is _____.
   a) induced absorption b) spontaneous emission
   c) stimulated emission d) none of this

5. The atom is initially in the lower state E it can group to E_2 by absorbing a photon of energy $h\vartheta$ this is _____.
   a) induced absorption b) spontaneous emission
   c) stimulated emission d) none of this

6. If T is the surface tension and a the increase in area then work done in increasing the area of a surface _____.
   a) $2\Pi r \times T$ b) $\frac{2T}{r}$ c) $T \times a$ d) T

7. Within the elastic limit stress in directly proportional to strain is known as _____.
   a) Hooke's law b) Pascal's law c) Poisson ratio d) none

8. Grating element is _____.
   a) width of ruling b) width of slit
   c) width of ruling and slit d) No. of lines on the grating

..2

9. The radius of the Newton's rings is proportional to _____.
   a) radius of curvature of the lens b) square root of wave length of light
   c) square root of radius of lens aperature d) square of the order

10. The phenomenon of polarization _____.
   a) Vibration lie in one plane
   b) plane of vibration and plane of polarization are $\perp$ r
   c) explains transverse nature of light
   d) all of them

11. Dimensional formula for surface tension is _____.
   a) MLT^{-2} b) L c) $\frac{MLT^{-2}}{M}$ d) MT^{-2}

12. Crystals which posses only one optic axis are called _____
   a) velocity b) uniaxial crystals c) refractive index d) none of this

13. Binary number 1100111 to convert decimal number _____
   a) 101 b) 102 c) 103 d) 104

14. The velocity above which the motion of the liquid becomes turbulent _____
   a) terminal velocity b) mean velocity
   c) critical velocity d) none

15. Angle of shear is also known as _____
   a) shearing strain b) angle of twist
   c) increase of volume d) decrease in volume

II FILL IN THE BLANKS:

16. The free surface of a liquid behaves like a _____.

17. The atom is initially in the lower states E_1 it can be raised to E_2 by absorbing a photon of energy $E_1 - E_2 = h\nu$. This process is called _____.

18. The potential energy per unit area of the surface film is _____.

19. Limiting velocity Ve at which the stream line motion changes to turbulent motion is called _____.

20. Ratio of lateral strain to longitudinal strain _____.

III STATE WHETHER TRUE OR FALSE:

21. Bulk modulus is the ratio of volume stress to volume strain.

22. Nicol prism can be used both as a polarizer an an analyzer.

23. If a_1 and a_2 are two cross section at which the velocities of the liquid are V_1 and V_2 then $a_1v_1=a_2v_2$ = constant.

24. Polarisation of light support the quantum nature of light.

25. Poisson's ratio is the ratio of longitudinal strain to volume strain.

IV ANSWER BRIEFLY:

26. Define Rigidity modulus?

27. Define interfacial surface tension?

28. Define Root mean square value of A.C.

29. What is neutral axis?

30. Give any two application of laser.

× × × × × × ×

STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.

(For candidates admitted during the academic year 2004-05 & thereafter)

SUBJECT CODE : **PH/AO/FP33**

B.Sc. DEGREE EXAMINATION NOVEMBER 2008

BRANCH IV - CHEMISTRY

THIRD SEMESTER

COURSE : **ALLIED – OPTIONAL**

PAPER : **FUNDAMENTALS OF PHYSICS**

TIME : **2 ½ HOURS** MAX. MARKS : 70

SECTION – B

ANSWER ANY FIVE QUESTIONS: (5 x 6 = 30)

1. Describe the working of the helium – neon laser (He-Ne).

2. Give the theory of Newton's rings.

3. Explain the phenomenon of double refraction.

4. Explain the meaning of the term terminal velocity. Deduce stokes law from dimensional consideration.

5. Write a note on the distribution of three phase A.C.

6. Explain the principles on which the electron microscope works.

7. In Young's double slit experiment the light has a frequency 6×10^4 Hz and distance between the centers of adjacent fringes in 0.75mm. If the screen is 1.5 m away what is the distance between slits?

SECTION – C

ANSWER ANY TWO QUESTIONS: (2 x 20 = 40)

8. Describe with theory an experiment to find the young's modulus of a beam by the method of non-uniform bending (pin and microscope)

9. Give the theory of a plane transmission grating and describe how it is used to determine the wave length of light.

10. a) Explain the Binary Addition, substraction and multiplication.
    b) Draw the circuit symbol and give the truth-table of AND, OR and NOT gates.

11. Describe the principle of Laser, properties and application of laser.

✕✕✕✕✕✕✕