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 2007 BRANCH IV - CHEMISTRY THIRD SEMESTER

REG. No. ALLIED – OPTIONAL COURSE : PAPER : **FUNDAMENTALS OF PHYSICS** TIME : **30 MINS.** MAX. MARKS: 30 **SECTION - A** TO BE ANSWERED IN THE QUESTION PAPER ITSELF **ANSWER ALL QUESTIONS:**  $(30 \times 1 = 30)$ Ι CHOOSE THE CORRECT ANSWER: The M.K.S. unit of Rigidity modulus is \_\_\_\_\_. a) N/m b)  $N/m^2$  c) Nm 1. d) N 2. Bending of light waves around corners and their spreading into the geometrical shadow of an object is called a) interference b) diffraction c) polarization d) none of these 3. Within the elastic limit, stress is directly proportional to strain is known as a) Hooke's law b) Pascal's law c) Poisson ratio d) none Grating element is a \_\_\_\_\_ 4. b) width of slit a) width of ruling c) width of ruling and slit d) No. of lines on the grating 5. 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 The phenomenon of polarization \_\_\_\_\_\_ 6. 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 The velocity above which the motion of the liquid becomes turbulent 7. a) terminal velocity b) mean velocity c) critical velocity d) none

8.	Angle of shear is also known as			
	a) shearing strain	earing strain b) angle of twist		
	c) increase of volume	d) decrease in volume		
9.	The atom is initially in the upper state $E_2$ it can drop to $E_1$ by emitting a photon of energy $hv$ this is			
	<ul><li>a) induced absorption</li><li>c) stimulated emission</li></ul>	<ul><li>b) spontaneous emission</li><li>d) non of this</li></ul>		
	c) stillulated ellission			
10.	Dimensional formula for surface tension is			
	a) <i>MLT</i> <sup>-2</sup> b) L	c) $\frac{MLT^{-2}}{M}$ d) $MT^{-2}$		
11.	The velocity at every point in the liquid real and direction is called			
		b) critical velocity		
	c) stream line flow	d) terminal velocity		
12.	Crystals which posses only one optic axis a a) velocity b) uniaxial crystals			
13.				
15.	Binary number 1100111 to convert decima a) 101 b) 102			
	a) 101 - 0) 102	c) 100		
14.				
	The total work done per unit volume is a) shearing stress b) force	c) <sup>1</sup> / <sub>2</sub> stress X strain d) none		
15.	When a ray of light is refracted by a crystal of calcite it gives two refracted rays is called			
		b) Brewster's law		
	c) Double refraction	d) Crystal		
II	FILL IN THE BLANKS:			
16.	Limiting velocity Ve at which the stream line motion changes to turbulent motion is called			
17.	Ratio of lateral strain to longitudinal strain			
18.	The potential energy per unit area of the surface film is			
19.	The atom is initially in the lower states $E_1$ it can be raised to $E_2$ by observing a photon of energy $E_1 - E_2 = hv$ . This process is called			
20.	The ratio of volume stress to volume strain is called			

#### III STATE WHETHER TRUE OR FALSE:

- 21. If  $a_1$  and  $a_2$  are two cross section at which the velocity of the liquid are  $V_1$  and  $V_2$  then  $a_1v_1=a_2v_2=$  constant.
- 22. Polarisation of light support the quantum nature of light.
- 23. Nicol prism can be used both as a polarizer an an analyzer.
- 24. Poisson's ratio is the ratio of longitudinal strain to volume strain.
- 25. Maser is a device extremely useful as a source of microwave.
- IV ANSWER BRIEFLY:
- 26. Explain the colour of thin films.
- 27. Explain the Brewster's law.
- 28. Define the turbulent flow.
- 29. Define the r.m.s value of an A.C.
- 30. Give the principal section of the crystal?

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COURSE	:	ALLIED – OPTIONAL	
PAPER	:	FUNDAMENTALS OF PHYSICS	
TIME	:	2 <sup>1</sup> / <sub>2</sub> HOURS	MAX. MARKS : 70

#### SECTION – B

ANSWER ANY FIVE QUESTIONS:

 $(5 \times 6 = 30)$ 

- 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 form 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. Explain the working of ammonia maser.

### SECTION – C

ANSWER ANY TWO QUESTIONS:

 $(2 \times 20 = 40)$ 

- 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.
- 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.

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