STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – $600\,086$. (For candidates admitted during the academic year 2011-2012 and thereafter)

SUBJECT CODE: 11PH/AC/PC33

B.Sc. DEGREE EXAMINATION NOVEMBER 2014 BRANCH III - PHYSICS THIRD SEMESTER REG. NO

COUR PAPEI TIME	R: PHYSICS FOR CHEMISTRY - 1							
SECTION – A TO BE ANSWERED IN THE QUESTION PAPER ITSELF ANSWER ALL QUESTIONS: (30x1=30)								
Choose	e the correct answer:							
1.	The moment of inertia of a body does not depend upon its a) angular velocity b) distribution of mass c) mass d) axis of rotation							
	The expression for the minimum time period of a compound pendulum is a) $2\pi \sqrt{\frac{2k}{g}}$ b) $2\pi \sqrt{\frac{k}{g}}$ c) $2\pi \sqrt{\frac{k}{2g}}$ d) $2\pi \sqrt{\frac{k+l}{lg}}$							
3.	Accelerated frames are called a) Non – Inertial frames b) Inertial frames c) Galilean frames d) none of these							
4.	According to theory of relativity, are variable a) Mass b) Velocity c) Mass and velocity d) None of these							
5.	Which of the following examples could be characterized as the result of surface tension a) A child sips milk through a straw b) Spilled mercury forms into small drops c) Table salt is in the form of cubic crystals d) None							
6.	Surface tension mainly arises due to a) Gravitational force b) Electrostatic force c) Cohesive molecular force d) Adhesive molecular force							
7.	Streamline motion is that motion in which there is a) Only longitudinal velocity gradient b) Only radial velocity gradient c) Longitudinal as well as radial velocity gradient d) Neither longitudinal nor radial velocity gradient							
8.	Hair of a shaving brush align together when it is removed from water, due to a) Surface tension b) Viscosity c) Elasticity d) None of these							

9.	Elastic energy stored a) Force x extension c) Stress/Strain	b) ½(Force x extension) d) ½(Stress/strain						
10.	The unit of young's ma) Nm ⁻¹		c) Me	ga pascal	d) Dyne	/cm		
11.	When white light is use a) Black			experiment, the olored		ges are		
12.	12. A soap bubble appears multicolored in white light due toa) Interferenceb) Diffractionc) Polarizationd) Scattering							
13.	Light transmitted by a single Nicol crystala) Plane polarizedc) Circularly polarized			b) Un polarizedd) Elliptically polarized				
14.	The bending of beam of light around cornea) Interferencec) Dispersion			rs of an obstacle is called b) Diffraction d) Polarization				
15.	 5. Polarized glass is used in sun glasses because a) It reduce the light intensity to half on account of polarization b) It is fashionable c) It has good colour d) It is cheaper 							
Fill in	the blanks:							
16. The contraction becomes appreciable only when v №								
17.	17. The unified mass unit $1u = \underline{}$.							
18.	18. In Torsional pendulum, the expression for period is							
19.	9. Nicol prism is used as a and							
20.	20. Brewster's law can be expressed as							
State whether true or false:								
21. In a compound pendulum the point of suspension and point of oscillation from a particle of equiperiodic and interchangeable points.								

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- 22. The time interval, between two events occurring at a given point in the moving frame s' appears to be longer in the stationary frame s, is called time dilation.
- 23. The ratio of longitudinal elongation to the lateral contraction is called poisson's ratio.

- 24. In Newton's ring experiment, the diameter of the rings formed is inversely proportional to square root of wavelength.
- 25. Spectrum obtained from a grating is usually called as grating spectrum.

Answer Briefly:

- 26. Write the Lorentz transformation equations.
- 27. What is frame of reference?
- 28. Define Hooke's law.
- 29. Define critical velocity.
- 30. Define double refraction.

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B.Sc. DEGREE EXAMINATION NOVEMBER 2014 BRANCH III - PHYSICS THIRD SEMESTER

COURSE : ALLIED - CORE

PAPER: PHYSICS FOR CHEMISTRY - 1

TIME : 2 ½ HOURS MAX. MARKS : 70

SECTION - B

ANSWER ANY FIVE QUESTIONS:

(5x6=30)

- 1. Obtain an expression for g using compound pendulum.
- 2. A uniform circular disc of 0.2m radius oscillates in its own plane about a point on its circumference. Calculate the period of oscillation.
- 3. A bar of length 1m, breadth 0.02m and thickness 0.005m is supported at its two ends and loaded in the middle for a load of 0.4kg, the depression at the centre is $2 \times 10^{-3} \text{m}$. Calculate the youngs modulus of the material of the bar.
- 4. In a drop weight method for the determination of surface tension between water and air, a glass tube of external diameter 2mm is used, and 100 drops of water are collected. The mass of these drops is 2.8 gms, find the surface tension of water in air.
- 5. How fast would a rocket have to be relative to an observer for its length to be contracted to 99% of its length at rest.
- 6. What is the highest order spectrum, which may be seen with monochromatic light of wavelength 6000Å by means of a diffraction grating with 5000 lines/cm.
- 7. State and explain Brewster's law.

SECTION - C

ANSWER ANY TWO QUESTIONS:

(2x20=40)

- 8. What is the meaning of mass-energy equivalence? Obtain Einstein's mass-energy relation. Show that 1U = 931 MeV.
- 9. Give the theory of a plane transmission grating and describe how it is used to determine the wavelength of light.
- 10. Derive an expression for the depression of the loaded end of a light cantilever.
- 11. Describe Newton's rings experiment and explain how it is used to determine the wavelength of sodium light.
