SUBJECT CODE : 11PH/AC/PC33

B.Sc. DEGREE EXAMINATION NOVEMBER 2012
BRANCH IV – CHEMISTRY
THIRD SEMESTER

REG. NO._____

COURSE   :   **ALLIED – CORE**
PAPER   :   **PHYSICS FOR CHEMISTRY -I**
TIME   :   **30 MINS.**   Max. Marks : 30
SECTION – A
TO BE ANSWERED IN THE QUESTION PAPER ITSELF

ANSWER ALL QUESTIONS: (30 × 1 = 30)
I   **CHOOSE THE CORRECT ANSWER:**
1.   The moment of inertia of a body does not depends upon its
      a) angular velocity   b) distribution of mass
      c) mass   d) axis of rotation

2.   If a gymnast, sitting on a rotating stool with his arms outstretched suddenly lowers his arms,
      a) angular velocity decreases   b) Moment of inertia decreases
      c) angular velocity stays constant   d) none

3.   According to theory of relativity, _____ are variable.
      a) Mass and velocity   b) Velocity
      c) Mass   d) None of these

4.   Accelerated frames are called
      a) Non – Inertial frames   b) Inertial frames
      c) Galilean frames   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.   A liquid drop tends to assume a spherical shape because of the
      a) Elastic force   b) Viscous force
      c) Gravitational force   d) Surface tension force

..2..

7. Machine parts are jammed in winter due to
    a) Increase in viscosity of the lubricant
    b) Decrease in viscosity of the lubricant
    c) Increase in surface tension of the lubricant
    d) Decrease in surface tension of the lubricant

8. Coefficient of viscosity is
    a) The ratio of shearing stress to the rate of change of strain
    b) The resistance per unit area to the deforming force
    c) The tangential stress per unit shearing strain
    d) None of these

9. Elastic energy stored per unit volume of a wire is
    a) Force x extension   b) ½(Force x extension)
    c) Stress/Strain   d) ½(Stress/strain)

10. The dimensional formula for coefficient of elasticity is
    a) $M^1L^{-1}T^{-2}$ b) $M^0L^1T^{-2}$
    b) $M^1L^1T^2$ d) $M^1L^{-1}T^2$

11. Two coherent sources of light produce destructive interference when the phase difference between them is
    a) 2π b) π
    c) $\pi/2$ d) $\pi/4$

12. A soap bubble appears multicolored in white light due to
    a) Interference   b) Diffraction
    c) Polarization   d) Scattering

13. Polarization of light waves afford a convincing evidence of
    a) dual nature   b) longitudinal nature
    c) quantum nature   d) Transverse nature

14. Interference and diffraction of light support the
    a) Transverse nature of light   b) quantum nature of light
    c) Wave nature of light   d) None of these

15. 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

II.   FILL IN THE BLANKS:

16.   The contraction becomes appreciable only when v _____.

17.   The unified mass unit 1u = _____.

18.   Unit of surface tension is _____ and dimensions are _____.

19.   Brewter's law can be expressed as _____.

20.   Nicol prism used as a _____ and _____.

III.   STATE WHETHER TRUE OR FLASE:

21.   In a compound pendulum the centre of suspension and the centre of oscillation are interchangeable.

22.   The laws of Physics are the same in all interial frames of reference.

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.   In a grating spectrum, dispersion is inversely proportional to frequency of light.

IV.   ANSWER BRIEFLY

26.   Explain the term moment of inertia.

27.   What is frame of reference?

28.   Define Hooke's law.

29.   What is the equation of continuity?

30.   Define double refraction.

******

SUBJECT CODE : 11PH/AC/PC33

B.Sc. DEGREE EXAMINATION NOVEMBER 2012
BRANCH IV – CHEMISTRY
THIRD SEMESTER

REG. NO._____

COURSE   :   ALLIED – CORE
PAPER   :   PHYSICS FOR CHEMISTRY – 1
TIME   :   2 ½ Hours   Max. Marks : 70

SECTION B

ANSWER ANY FIVE QUESTIONS: **(5 × 6 = 30)**

1. Derive Einstein's Mass- energy relation $E = mc^2$.

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. Calculate the Poisson's ratio for the material, given $Y = 12.25 \times 10^{10} N/m^2$ and $\eta = 4.55 \times 10^{10} N/m^2$.

4. Explain the terms stream line motion and rate of flow of a fluid.

5. A parallel beam of light ($\lambda = 5890 Å$) is incident on a thin glass plate ($\mu = 1.5$) such that the angle of refraction is 60°. Calculate the smallest thickness of the plate which will appear dark by reflection.

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. Newton's rings are observed in reflected light of $\lambda = 5.9 \times 10^{-5}$ cm. The diameter of the 10th dark ring is 0.5 cm. Find the radius of curvature of the lens and the thickness of the air film.

SECTION – C

ANSWER ANY TWO QUESTIONS: **(2 × 20 = 40)**

8.   State the postulates of special theory of relativity and derive the Lorentz transformation equation.

9.   Define surface tension. Explain the drop-weight method experiment to determine the surface tension of a liquid.

10. Derive an expression for the depression at the loaded end of the cantilever.

11. Describe Newton's rings experiment and explain how it is used to determine the wavelength of sodium light.

****