MID-TERM EXAMINATION
B.Tech (IT /MAE, DMAM), 1ˢᵗSemester
(January, 2023)
OFF LINE mode

Subject Code: BAS -103	Subject: Applied Physics-I

Time : 1 ½Hours   Maximum Marks : 30

Q1   Attempt all Parts   (2.5*4)
   (a) What is Temporal and Spatial Coherence?
   (b) What is Brewster law? When sunlight falls on the surface of water at an
      incidence of 50, the reflected light is found to be completely plane-
      polarized. Find the angle of refraction and the refractive index of water.
   (c) What is damped harmonic motion (S.H.M.)?Discuss various conditions of
      damping.
   (d) A particle executes SHM of period 22 sec and amplitude 5 cm. Calculate its
      maximum velocity and maximum acceleration.

Q2   (Attempt any Two Parts)   UNIT-1   (5,5)
   (a) What do you understand by diffraction of light?Derive and draw the Fraunhoffer diffraction
      due to N-slits.
   (b) Consider a uniform transparent film having thickness t and a refractive index μ. A ray of
      light AB incident at an angle i on the upper surface of the film is partly reflected and
      refracted obtain the condition of maxima and minima for the interference due to reflected
      waves.
   (c) A plane wave front of monochromatic light is incident normally on a plane
      transmissiongrating. Calculate the diffraction angles of first and second order spectra. The
      wavelength oflight is 6000Å and the grating has 600 lines per mm. Also calculate the value
      of grating element.

Q3   (Attempt any Two Parts)   UNIT-2   (5,5)
   (a) What is the difference between central and non-central forces? Find a differential equation
      for the motion under central force.
   (b) What is damped harmonic oscillator? Suppose a system has a body of mass m attached to a
      spring in vertically downward direction, whose force constant is k and a damping force
      $q\frac{dx}{dt}$is acting on the system. Find the solution of the equation of damped harmonic oscillator
      and discus the condition of over damped oscillations.
   (c) A particle executes linear SHM about x=0. At t=0, it has displacement 4cm and zero velocity.
      If the frequency of the motion is 0.5/s, find (i) period (ii) angular freq. (iii) amplitude (iv)
      max. speed (v) displacement and velocity at t=4s.