ATKT F.Y.B.Sc. Sem II

25

260915

VCD FYBSC PHYSICSI SEM-II 2015-2016 MARKS-75 TIME-2:30HRS

NOTE: Figures to the right indicate full marks.
Non programmable calculators are allowed.
All questions are compulsory.

Q1) Answer the following. (20M)

A) Discuss the composition of two parallel simple harmonic motion of the same period. Show that the resultant motion is also a simple harmonic motion having same period. (8M)

OR

A) Set up the equation of motion for rocket-motion and derive expression for the maximum velocity attained by rocket. (8M)

B) Discuss the law of conservation of total energy of a system of particle. (7M)

OR

B) Discuss the composition of two perpendicular simple harmonic motion of same period and show that the path of the resultant motion, in general, is an inclined ellipse. (7M)

C) Show that a particle whose potential energy is $\frac{1}{2}Kx^2$, where K is a constant, executes simple harmonic motion. (5M)

OR

C) Explain the concept of centre of mass of a system of particle. (5M)

Q.2) Answer the following. (20M)

A) Write a note on cardinal points of a system of lenses. Show that the nodal points coincide with the principal points for the system of lenses placed in the medium on the either side. (8M)

OR

A) Give the theory of interference in thin film. Derive an expression for the optical path difference; hence explain the colours of thin film. (8M)

B) Explain the phenomenon of refraction through a thin lens. Derive an expression for the focal length of lens. (7M)

OR

B) Explain the formation of colours in thin film and show that when the film is illuminated by a monochromatic of light, the interference pattern of reflected and transmitted light are complementary. (7M)

C) Explain how you will use a spectrometer to find the angle of minimum deviation. (5M)

OR

C) Explain spherical aberration with the help of neat ray diagram. (5M)

2) Answer the following. (20M)

A) Describe the construction and working of He-Ne laser with the help of energy level diagram (8M)

OR

A) What is numerical aperture (NA) of an optical fibre? Derive necessary expression for it. (8M)

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