



C14-EE-103/C14-CHPP-103

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BOARD DIPLOMA EXAMINATION, (C-14)

MARCH/APRIL—2016

DEEE-FIRST YEAR EXAMINATION

ENGINEERING PHYSICS

Time : 3 hours]

[Total Marks : 80

PART—A

3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Write the base and supplementary units of SI system along with their symbols.
2. Define scalars and vectors and give one example for each.
3. A body is thrown up vertically with a velocity of 19.6 m/s. Find the maximum height reached by the body.
4. State the conditions of SHM.
5. Write any three differences between specific gas constant and universal gas constant.
6. Define beats and write any two applications of beats.

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7. Define capillarity and give two examples.
8. Define coefficient of viscosity and write its SI unit and dimensional formula.
9. Define magnetic lines of force and magnetic field.
10. Write any three applications of optical fibers.

PART—B

10×5=50

Instructions : (1) Answer *any five* questions.
 (2) Each question carries **ten** marks.
 (3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. (a) Define scalar product. Mention any five properties of scalar product. 2+5
- (b) A force of $(3\hat{i} - 2\hat{j} + 5\hat{k})$ N acts on a body and produces a displacement of $(3\hat{i} + 2\hat{j} + \hat{k})$ m. Calculate the work done. 3
12. (a) Derive the expression for maximum height and time of flight of a projectile in oblique projection. 6
- (b) A stone is projected upwards from the top of a tower with a velocity of 9.8 m/s. It reaches the ground in 4 seconds. Find the height of the tower. 4
13. (a) State any three laws of friction. 3
- (b) Write any two advantages of friction. 2
- (c) Derive the expression for acceleration of a body projected up on a rough inclined plane with necessary diagram. 5

14. (a) State work-energy theorem. 2
- (b) Derive an equation for the kinetic energy of a body. 4
- (b) A machine gun fires 360 bullets per minute and each bullet travels with a velocity of 600 m/s. If the mass of each bullet is 5 gram, find the power of the machine gun. 4
15. (a) Derive the expression for velocity and time period of a particle executing SHM. 7
- (b) The displacement of a particle executing SHM is given by the equation $y = 5 \sin[2\pi t / 6]$. Find in SI units—
- (i) amplitude;
- (ii) initial displacement;
- (iii) epoch. 3
16. (a) Prove that $C_p - C_v = R$. 6
- (b) State the first and second laws of thermodynamics. 4
17. (a) Define longitudinal wave motion. 2
- (b) Define echo. Write any two applications of echo. 4
- (c) Calculate the velocity of sound in air if an observer at a distance of 425 m from a building hears an echo after 2.5 s. 4
18. (a) State Kirchhoff's laws of electricity. 4
- (b) Derive an expression for the balancing condition of Wheatstone's bridge with circuit diagram. 6
