



**C14–A/AA/AEI/BM/CH/CHST/C/CM/EC/EE/CHPP/
CHPC/CHOT/PET/M/RAC/MET/
MNG/IT/PCT–103**

4003

BOARD DIPLOMA EXAMINATION, (C–14)

OCT/NOV—2017

FIRST YEAR (COMMON) 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 dimensional formulae for work, power and pressure.
2. State and explain triangular law of vectors.
3. Derive the expression for maximum height reached by a body in the case of vertical projection.
4. Write the conditions for simple harmonic motion.
5. State three gas laws.
6. Define echo and write two applications of echo.

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7. Define the terms (a) stress, (b) strain and (c) elasticity.
8. Define surface tension and write two examples.
9. Define magnetic field and magnetic line of force.
10. State three properties of superconductors.

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 vector product of two vectors and write any five properties of vector product. 2+5
 (b) Two equal vectors have their resultant is equal to either of them. Then find the angle between two vectors. 3
12. (a) Derive an expression for the time of flight and horizontal range of a projectile in oblique projection. 3+3
 (b) An aeroplane flying horizontally with a speed of 270 kmph releases a body at a height of 490 m from the ground. Find when and where the body strikes the ground. 4
- * 13. (a) Define three types of friction and show that $\tan \theta = \mu$ where μ is coefficient of friction and θ is the angle of friction. 3+3
 (b) Write four methods for reducing friction. 4
14. (a) Define work, power and energy. 3
 (b) Derive the expression for the kinetic energy of a body. 4
 (c) A stone of mass 1 kg is freely falling from a height of 10 m. Find its potential energy and kinetic energy after it has travelled a distance of 2 m from the top. 3

15. (a) Derive the expression for velocity and acceleration of a particle executing simple harmonic motion. 6
- (b) Define seconds pendulum and find the length of seconds pendulum when value of $g = 9.8 \text{ m/s}^2$. 4
16. (a) Prove that $C_P - C_V = R$. 6
- (b) Distinguish between isothermal change and adiabatic change. 4
17. (a) Write four methods for controlling noise pollution. 4
- (b) Write applications of Doppler's effect. 4
- (c) Define beats. Write two applications of beats. 2
18. (a) Derive the balancing condition for Wheatstone's bridge with neat diagram. 7
- (b) The force between two short magnets is F . When the pole strength is doubled and distance between the magnets is halved, what is the force between them? 3

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