



C09-A-103/C09-AA-103/C09-AEI-103/C09-BM-103/
C09-C-103/C09-CM-103/C09-CH-103/
C09-CHPP-103/C09-CHPC-103/C09-CHOT-103/
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C09-PET-103/C09-TT-103/C09-RAC-**103**

3003

BOARD DIPLOMA EXAMINATION, (C-09)
OCT/NOV—2016
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 the limitations of dimensional analysis.
2. State and explain the dot product of two vectors.
3. A stone is dropped from the top of a building and reaches the ground after 4 seconds. What is the height of the building?
[Let $g = 10 \text{ m/s}^2$]
4. Why is static friction more than kinetic friction?

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1

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5. Define the terms 'seconds pendulum' and 'phase'.
6. Why does a gas has two specific heat?
7. Write any three differences between musical sound and noise.
8. Define viscosity. Give two examples for it.
9. Define the terms (a) magnetic field, (b) magnetic moment and (c) magnetic induction field strength.
10. Write any three properties of superconductor.

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) State parallelogram law of vectors and derive an expression for the magnitude of the resultant of the two vectors. 6

- (b) A force of $\vec{F} = 3\vec{i} + 5\vec{j} + 5\vec{k}$, produces a displacement $\vec{S} = 5\vec{i} + 7\vec{j} + 2\vec{k}$ in 1 minute. Find the work done and power. 4

12. (a) A body is projected vertically upwards. Derive expression for (a) maximum height reached and (b) time of ascent. 3+3=6

- (b) A football player hits the ball with a velocity of 50 m/s at an angle of 60° with the horizontal. Find the maximum height reached and time of flight. 4

13. (a) Define kinetic energy and prove that $KE = \frac{1}{2} mV^2$. 6
- (b) Calculate the horsepower of the engine required to lift 1.08×10^6 kg of coal per hour from a mine of 74.6 m deep. 4
14. (a) Derive an expression for the time period of a simple pendulum. 6
- (b) The displacement of a particle executing SHM is given by the equation $Y = 5 \sin(4t + \frac{\pi}{6})$. All quantities are expressed in SI. Find the amplitude, angular velocity, time period and phase. 4
15. (a) State gas law. 3
- (b) Prove that $PV = RT$. 4
- (c) Pressure of a certain mass of a gas at 27 °C is 780 mm of Hg. If it is heated to 77 °C by keeping volume constant, what is its new pressure? 3
16. (a) What is Doppler effect? Derive an expression for the apparent frequency of sound when the source is in motion and observer is at rest. 7
- (b) State and explain Sabine's formula. 3
17. (a) Explain surface tension on the basis of molecular theory. 4
- (b) State and explain three moduli of elasticity. 6
18. (a) Derive the equation for the balancing condition of Wheatstone bridge. 7
- (b) If the moment of magnet is 0.4 Am^2 , what is the magnetic induction on the axial line at point 40 cm away from the midpoint? 3
