



C-14-A/AA/BM/CH/CHST/AEI/FW/MET/MNG/IT/TT/PCT/PKG/PPT-103

4003

BOARD DIPLOMA EXAMINATION, (C-14)

APRIL/MAY—2015

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 base and supplementary units of SI system along with their symbols.

2. Forces of equal magnitudes p acts on a point. If the angle between the two vectors is θ , what is the magnitude of the resultant?

3. Write the equations of motion of a freely falling body.

4. The equation of a particle executing SHM is given by $y = 5 \sin 2t - \frac{\pi}{4}$, where the quantities are in SI units. Find (i) amplitude, (ii) angular velocity and (iii) initial phase.

5. Distinguish between gas constant and universal gas constant.

6. * Write any three applications of Doppler's effect.
7. Define stress, strain and mention their SI units.
8. Define surface tension. Give one example.
9. State Ohm's law. Write one limitation.
10. Write a short note on photo-electric cell with diagram.

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 dot product of two vectors. Write its five properties. 7
 (b) If two forces of 30 N and 40 N act simultaneously on a particle inclined at 60° to each other, find the magnitude of the resultant. 3
12. (a) Show that the path of the projectile is a parabola in horizontal projection. 6
 (b) A football is projected with a velocity of 29.4 m/s at an angle of 30° to the horizontal. Find the maximum height reached and horizontal range. 4
13. (a) State the laws of friction. 4
 (b) Write any two advantages of friction. 2
 (c) A body is sliding down a rough inclined plane which makes an angle of 45° with the horizontal. Calculate the acceleration if $\mu = 0.1414$. 4

- 14.** ^{*} (a) State work-energy theorem and prove it. 6
- (b) Calculate the power of an engine used to pump 5000 litre of water per minute from a well of 20 m deep if 25% of power is wasted. 4
- 15.** (a) Derive expressions for (i) displacement and (ii) velocity for a body in SHM. 6
- (b) A body is executing SHM with an acceleration of 0.4 m/s^2 at a displacement of 0.6 m. Find its acceleration at a displacement of 0.5 m. 4
- 16.** (a) Distinguish between isothermal and adiabatic processes. 5
- (b) The pressure of a given mass of gas enclosed in a bulb increases by three times and the volume is reduced by $1/5$ of its volume. If the gas was initially at 27°C , what will be its final temperature? 5
- 17.** (a) Distinguish between musical sound and noise. 3
- (b) Write any four causes of noise pollution. 4
- (c) A boy hears an echo of his own voice from a distant hill after 3 seconds. If the velocity of sound is 350 m/s , find the distance of the hill. 3
- 18.** (a) Derive an expression for magnetic induction field strength at a point on the axial line of a bar magnet. 7
- (b) Write the formula in Meter Bridge to determine specific resistance and name the symbols in it. 3
