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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.

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- * 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
