# 6018

## BOARD DIPLOMA EXAMINATION, (C–16)
## MARCH/APRIL—2017
## DCE—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 dimensional formulae of the following :

*(a)* Velocity

*(b)* Force

*(c)* Frequency

**2.** Write three properties of scalar product.

**3.** Define projectile. Give two examples.

**4.** The simple harmonic motion of a body is given by the equation $y = 4 \sin\left(100t - \dfrac{\pi}{4}\right)$. Find *(a)* angular velocity, *(b)* time period and *(c)* initial displacement.

**5.** State first and second laws of thermodynamics.

**6.** Write three differences between musical sound and noise.

**7.** Define stress and strain. State Hooke's law.

**8.** Obtain Newton's formula for viscous force.

**9.** State and explain Coulomb's inverse square law of magnetism.

**10.** List three applications of optical fiber.

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**PART—B** 10×5=50

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***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)* Derive the expression for magnitude of resultant of two vectors using parallelogram law of vectors.   6

     *(b)* A force of 150 N acts on a particle at an angle of 30° to the horizontal. Find the horizontal and vertical components of force.   4

**12.** *(a)* Show that path of a projectile is a parabola in case of oblique projection.   6

     *(b)* A stone is projected with a velocity of 20 m/s at an angle of 30° to horizontal. After 1·5 seconds, find its horizontal distance and vertical height from its starting point.   4

**13.** *(a)* State any five advantages of friction.   5

     *(b)* A body is sliding down a rough inclined plane which makes an angle of 30° with the horizontal. Calculate the acceleration if the coefficient of friction is 0·25.   5

**14.** *(a)* Derive the expression for kinetic energy.   5

     *(b)* A machine gun fires 240 bullets per minute with a velocity of 500 m/s. If the mass of each bullet is 3 gm, find the power of the machine gun.   5

**15.** *(a)* Define simple harmonic motion. Give three examples. 5

*(b)* Derive an expression for velocity of a particle performing simple harmonic motion. Draw necessary diagram. 5

**16.** *(a)* Define the two molar specific heats of a gas. 4

*(b)* Derive the ideal gas equation. 6

**17.** *(a)* Define noise pollution. 2

*(b)* Write any four effects of noise pollution. 4

*(c)* State four applications of beats. 4

**18.** *(a)* Derive an expression for balancing condition of Wheatstone's bridge with neat circuit diagram. 6

*(b)* The values of resistance of *P*, *Q*, *R* are 50 ohms, 10 ohms, 15 ohms respectively in the balanced condition of the bridge. Find the unknown resistance *S*. 4

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