



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/
C09-CHST-103/C09-EC-103/C09-EE-103/
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C09-PET-103/C09-TT-103/C09-RAC-**103**

3003

**BOARD DIPLOMA EXAMINATION, (C-09)
OCT/NOV—2018
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.
(4) Take the value of acceleration due to gravity 'g' as 9.8 m/s² wherever it is necessary.

1. Write any three uses of dimensional formulae.
2. A force $\vec{F} = 6\hat{i} + 12\hat{j} + 8\hat{k}$ N displaced an object through $\vec{S} = 2\hat{i} + 8\hat{j} + 2\hat{k}$ m in its direction. Find the work done.
3. A food bag is dropped from a balloon ascending with a uniform velocity of 19.6 m/s and reaches the ground in 10 seconds. Find the height of the balloon when the bag reaches the ground.

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4. Define angle of friction and angle of repose.
5. State the conditions of SHM.
6. Define gas constant r and universal gas constant R .
7. Write any three characteristics of musical sound.
8. Define the three types of stress.
9. Define the terms magnetic moment M and magnetic induction field strength B .
10. Write any three applications of photo electric cell.

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 and explain polygon law of vectors with a neat diagram. 2+4
(b) If the vectors $\vec{A} = 2\hat{i} + 2\hat{j} + \hat{k}$ and $\vec{B} = \hat{i} + 3\hat{j} + \hat{k}$ are two adjacent sides of a parallelogram. Find the area of the parallelogram. 4
12. (a) Define projectile and give two examples. 4
(b) Show that the path of the projectile is a parabola in case of horizontal projection. 6
13. (a) State law of conservation of energy and verify it in the case of a freely falling body. 2+6
(b) A body of mass 10 kg is lifted to a height 20 m. Find the work done. 2

14. (a) Derive the equations for velocity and acceleration of a body in SHM. 3+3

- (b) A particle is executing SHM according to the equation

$$y = 4 \sin \frac{\pi}{4} t - \frac{\pi}{6}$$

All the quantities are in SI system. Find the maximum velocity and initial displacement. 4

15. (a) Derive the ideal gas equation $PV = nRT$. 6

- (b) Some energy is supplied to a gas at constant pressure 2×10^5 Pa. The increase in volume of the gas is 10^{-2} m^3 . If the increase in internal energy of the gas is 1500 J, find the energy supplied to the gas. 4

16. (a) Define reverberation and reverberation time. 4

- (b) What is Doppler Effect? Derive the equation for apparent frequency of sound heard by an observer who is approaching a source of sound at rest. 1+5

17. (a) Define coefficient of viscosity. What is the effect of temperature on viscosity of liquids and gases? 2+1+1

- (b) Define surface tension. Explain surface tension based on molecular theory. 2+4

18. (a) Derive the balancing condition for Wheatstone bridge with circuit diagram. 6

- (b) A balance point in a meter bridge experiment is obtained at 40 cm from left. If the right gap has 10.5 ohm resistance, calculate the resistance in the left gap. 4
