5003-A

BOARD DIPLOMA SUPPLEMENTARY (INSTANT) EXAMINATION, (C-16)

JUNE - 2019

FIRST YEAR (COMMON) EXAMINATION

ENGINEERING PHYSICS

Time : **3** Hours]

[Total Marks : **80**

PART - A 2×15=30

Instructions :
(1) *Answer any **15** questions.*
(2) *Each question carries **2** marks.*
(3) *Answer should be brief and straight to the point and shall not exceed five simple sentences.*

1 Write any two limitations of dimensional analysis.

2 Write the dimensional formulae for (i) Stress (ii) Surface tension.

3 State triangle law of vectors.

4 Find unit vector in the direction of $6\hat{i} - 2\hat{j} + 9\hat{k}$

5 Define acceleration due to gravity and write its SI units.

6 Define projectile and give one example.

7 Write any two laws of friction.

8 Write any two methods of reducing friction.

9 Find the kinetic energy of a bullet of mass 5 gram fired with a velocity of 100 m/s.

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10   Write any two conditions for SHM.

11   Define amplitude and time period of SHM.

12   Define absolute zero and write the relation between absolute temperature and centigrade temperature.

13   State 1st law of thermodynamics and write its mathematical form.

14   Distinguish between musical sound and noise in 2 aspects.

15   Write any two applications of Doppler effect.

16   Define stress and strain.

17   Explain the effect of temperature on viscosity of liquids and gases.

18   State and explain Ohm's law.

19   Two magnetic poles of strength 40 Am and 50 Am are separated by a distance of 10 cm in air. Calculate the force between them.

20   Write any two applications of superconductors.

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PART - B $10 \times 5 = 50$

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Instructions :   *(1)   Answer any **FIVE** questions.*
*(2)   Each question carries **TEN** marks.*
(3)   Answer should be comprehensive and criterion for valuation is the content but not the length of the answer.

21   (a)   State parallelogram law of vector addition. Derive   **2+5**
expression for magnitude and direction of resultant of two vectors by using parallelogram law of vector.

(b)   A force $6\hat{i} + 3\hat{j} + 5\hat{k}$ produces a displacement of   **3**

$3\hat{i} - 5\hat{j} + 6\hat{k}$. Find the work done by force.

22   (a)   Derive the expression for time of flight and range   **3+3**
in oblique projection.

(b)   A ball is thrown at an angle $45°$ to the horizontal   **2+2**
with an initial velocity of 49 ms^{-1}. Find its (i) time of flight (ii) horizontal range.

23 (a) State and prove law of conservation of energy in the case of a freely falling body.   **2+5**

    (b) Derive relation between momentum and kinetic energy.   **3**

24 (a) Define simple pendulum. Derive an expression for time period of a simple pendulum.   **2+6**

    (b) Define second's pendulum.   **2**

25 (a) Derive $C_p - C_v = R$ **6**

    (b) Write any four differences between isothermal process and adiabatic process.   **4**

26 Define noise pollution. Mention any four effects and four methods of minimizing noise pollution.   **2+4+4**

27 (a) State Kirchoff's laws. Derive the balancing condition of Wheatstone's bridge.   **2+6**

    (b) Three currents 2 mA, 4 mA and 6 mA are flowing towards the junction and two currents 5 mA and i_5 are flowing away from the junction. Find the value if i_5.   **2**

28 (a) Define photoelectric effect. And state any four laws of photoelectric effect.   **2+4**

    (b) Explain the principle and working of an optical fiber.   **4**

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