6003
BOARD DIPLOMA EXAMINATION
JUNE - 2019
DIPLOMA IN AUTOMOBILE ENGINEERING
ENGINEERING PHYSICS
FIRST YEAR EXAMINATION

Time: 3 Hours   **Total Marks: 80**

PART - A   (3m x 10 = 30m)

Note 1:Answer all questions and each question carries 3 marks

2:Answers should be brief and straight to the point and shall not exceed 5 simple sentences

1. Define dimensional constants? Give two examples

2. **Find the unit vector of force** $F = 3\hat{i} + \hat{j} - \hat{k}$

3. **Define projectile and give two examples**

4. A The displacement of a particle executing SHM is given as $y = 4 \sin(\pi t + \pi/3)$. Find its time period, frequency and initial phase.

5. Define adiabatic process. Does this process obey the Boyle's law?

6. Define beats. Draw the diagram of the phenomenon beats

7. State the Hooke's law. Write S.I unit and dimensional formula of modulus of elasticity

8. Define surface tension and capillarity

9. **Define magnetic lines of force**. Write any one characteristic of magnetic lines of force

10. Write the Einstein's photo electric equation and write the names of terms involved in the equation

PART - B   (10m x 5 = 50m)

Note 1:Answer any five questions and each carries 10 marks

2:The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer

11. a.   State and explain polygon law of addition of vectors with figure   5M
    b. If scalar product of two vectors is equal to the magnitude of their vector product, then find angle between the vectors   5M

12. a) Prove that the trajectory of a projectile in horizontal projection is parabola   6M

    b) An aeroplane flying horizontally with a velocity of 100 m/s and drop a bomb. The aeroplane is at a height of 1960 m from the ground. Find when and where the bomb will strike the ground   4M

13. a) Explain briefly about three types of frictional forces.   7M

    b) Calculate the force required to move a body of mass 20 kg on a rough horizontal surface having coefficient of Kinetic friction 0.5   3M

14. a) Define kinetic energy. Derive expression for kinetic energy.   6M

    b) Derive the relation between kinetic energy and momentum.   4M

15. a) Explain that the projection of uniform circular motion on any diameter of a circle is simple harmonic.   7M

    b) The maximum acceleration of a particle undergoing SHM is 15 m/s^2. Find the acceleration of the particle at the point where its displacement from mean position is 1/3 rd of its amplitude   3M

16. a) Derive ideal gas equation.   6M

    b) A gas of 0.05 m^3 volume is collected at 27 °C temperature and 750 mm of Hg pressure. Find its volume at 7 °C temperature and 760 mm of Hg pressure   4M

17. a) Define Doppler effect. Write any four applications of Doppler effect   6M

    b) Define echo. Mention any two methods reducing echoes   4M

18. a) Define magnetic induction field strength write its unit.   3M

    b) Derive an expression for the magnetic induction field strength at a point on the equatorial line of a short bar magnet   7M

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