6018
BOARD DIPLOMA EXAMINATION
MARCH/APRIL - 2019
* **DIPLOMA IN CIVIL 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. **Write any three advantages of SI units system**.

2. A body is thrown with some velocity at an angle of 60° with the horizontal. If its horizontal component is 50 m/s what is the actual velocity and its vertical component

3. **Derive the expression for time of ascent of a body projected vertically upwards**.

4. Define the terms i) Time period ii) Amplitude iii) Phase of SHM

5 The pressure of a gas at 27 °C   is 90 cm of Hg. Volume remaining constant, find the temperature at which the pressure changes to 150 cm of Hg

6. **Define reverberation and reverberation time**.

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

8. **Explain surface tension and write it's SI units**.

9. Derive an expression for specific resistance of the material of a conducting Wire

* 10. **Write any three laws of photo electric effect**.

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) **Define scalar product and write any two examples of scalar product**.   **4M**

    b) **Write any six properties of scalar product**   **6M**

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 drops 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) Define angle of friction and angle of repose.   **4M**

    b) Derive expression for acceleration of a body moving downwards on a rough inclined plane   **6M**

14. a) Prove the law of conservation of energy in case of a freely falling body.   **7M**

    b) A bullet of mass 10 grams is fired with a velocity of 300m/s. Find its kinetic energy.   **3M**

15. a)   Derive an expression for the acceleration of a particle executing SHM.   **7M**

    b) The displacement of a particle in SHM is given by $y = 10 \sin (\frac{\pi}{2}t + \pi/3)$. Find its initial displacement and its displacement when t = 1 s.   **3M**

16. a) Write any four differences between isothermal and adiabatic processes.   **6M**

    b) Derive relationship between C_p and C_v **4M**

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

    b) Distinguish between echo and reverberation   **4M**

18. a) Derive an expression for the magnetic induction field strength at a point on the axial line of a short bar magnet.   **7M**

    b) A bar magnet of magnetic moment 1 Am^2 makes an angle of 30° with a uniform magnetic field of 100 T. Find the moment of couple acting on it   **3M**

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