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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