

3003
BOARD DIPLOMA EXAMINATION, (C-09)
JUNE - 2019
DIPLOMA IN AUTOMOBILE ENGINEERING
ENGINEERING PHYSICS (COMMON)
FIRST YEAR EXAMINATION

Time: 3 Hours

Total Marks: 80

PART - A (10 x 3 = 30 Marks)

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. State the applications of dimensional analysis.
2. State parallelogram law of vectors and write formula for magnitude of the resultant.
3. A body is allowed to fall freely from a height 1960 m. Find the velocity on reaching the ground.
4. Define friction. Give two examples of friction in daily life.
5. Write the formula for the acceleration of a particle executing SHM and obtain the formula for maximum and minimum values for acceleration.
6. State the first law of thermodynamics. What type of conservation law does it represent?
7. Write Sabine's formula and name its factors of influence.
8. Define stress and strain. Write unit of stress in SI system.
9. Three resistors 5Ω , 2Ω and 10Ω are connected in the three arms of the Wheatstone's bridge in the cyclic order. What resistance must be connected in the fourth arm to balance the bridge?
10. Define the critical angle and total internal reflection?

PART - B (5 x 10 = 50 Marks)

Note 1: Answer any five questions and each question 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 vectors with a figure. 5 marks
b. A force $\vec{F} = I + 5j + 7k$ acts on the particle and displaces through a displacement of $\vec{S} = 6i + 9k$ Calculate work done. 5 marks
12. a) Show that the path followed by a body projected horizontally is a parabola. 7 marks
b) A bomb is dropped from an aeroplane flying horizontally with a velocity of 9.8 m/s at a height 78.4 m from the ground. Find when and where it reaches the ground. 3 marks
13. a) State the principle of conservation of energy. 2 marks
b) Prove the law of conservation of energy in case of a freely falling body. 6 marks
c) A bullet of mass 10 grams is fired with a velocity of 300 m/s. Find its kinetic energy. 2 marks
14. a) Derive an expression to find the time period of a simple pendulum. 6 marks
b) The acceleration due to gravity on the surface of moon is 1.7 m/s^2 . What is the time period of a simple pendulum on the moon if its period on the earth is 3.5 second (g on earth is 9.8 m/s^2) 4 marks

15. a) State Charles' law at constant pressure and constant volume. 4 marks
b) Define absolute zero and write the melting point of ice and boiling point of water on absolute scale. 4 marks
c) Define an ideal gas. 2 marks
16. (a) Define beats and write three applications of beats 5 marks
(b) Write any Five effects of noise pollution? 5 marks
17. a) Explain the concept of surface tension with reference to molecular theory. 6 marks
b) A capillary tube of inside diameter 1mm is dipped vertically in a liquid of surface tension 63×10^{-3} N/m and density 1262 kg/m^3 . Find the height of the capillary rise if the angle of contact is 10° 4 marks
18. a) State Coulomb's inverse square law. Explain its mathematical form. 3 marks
b) Derive an expression for the magnetic field strength at a point on the axial line of bar magnet. 7 marks

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