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C09-A-103/C09-AA-103/C09-AEI-103/C09-BM-103/
C09-CH-103/C09-CHST-103/C09-FW-103/
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3003

**BOARD DIPLOMA EXAMINATION, (C-09)
OCT/NOV—2013
FIRST YEAR (COMMON) EXAMINATION
ENGINEERING PHYSICS**

Time : 3 hours]

[Total Marks : 80

PART—A

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

1. State the limitations of dimensional analysis.
2. State and explain triangle law of vectors.
3. A stone is dropped into a well of depth 78.4m, and the splash of sound is heard after 4.23 s. Calculate the velocity of sound. ($g=9.8\text{m/s}^2$)
4. Write any three advantages of friction.
5. Define simple harmonic motion and state at least two examples.
6. State the two laws of thermodynamics.
7. What are beats? State any two applications.
8. Define stress and write its dimensional formula.
9. Define magnetic induction field strength. What is its SI unit?
10. Write any three applications of optical fibres.

PART—B

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

11. (a) Define 'dot product' and 'cross product' of two vectors. 4
(b) Write any three characteristics of scalar product. 3
(c) Find the area of triangle formed by $A = 3\hat{i} + 4\hat{j}$ and $B = 4\hat{i} + 3\hat{j}$. 3

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12. (a) Define an oblique projectile. Give any two examples. 3
(b) Derive the equation of a resultant velocity of a projectile in oblique projection. 7
13. (a) State the law of conservation of energy and prove it in the case of a freely falling body. 7
(b) Deduce the relation between momentum and kinetic energy of a moving body. 3
14. (a) Derive an expression for the time period of oscillation of simple pendulum. 6
(b) A body is executing SHM with an acceleration of 0.4 m/s^2 at a displacement of 0.6 m . Find its acceleration at a displacement of 0.4 m . 4
15. (a) Derive C_p , C_v , R . 6
(b) A gas at 27°C has its temperature raised so that its volume is doubled. The pressure remaining constant. What is the final temperature? 4
16. (a) What is Doppler effect? Derive the expression for apparent frequency of sound while source is moving away from the stationary observer. 6
(b) A fire engine with its bell ringing with a frequency of 285 Hz is moving with a velocity of 54 kmph towards an observer at rest near a hut on fire. What is the apparent frequency of sound heard by the observer? Velocity of sound in air is 340 m/s . 4
17. (a) Define surface tension and explain how surface tension is experimentally determined by capillary method. 8
(b) What is the effect of temperature on viscosity of liquids and gases? 2
18. (a) State Kirchhoff's laws. 3
(b) Explain the principle and explain the experimental determination of unknown resistance. 7
