

3013

BOARD DIPLOMA EXAMINATION, (C-09)

OCT/NOV—2013

DCE—FIRST YEAR EXAMINATION

ENGINEERING PHYSICS

Time : 3 hours]

[Total Marks : 80

PART—A

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

1. State any three advantages of SI units.
2. Define scalar and vector. Give one example each.
3. A body is falling freely from a height 19.6 m. Find its velocity on reaching ground and time, required in reaching the ground.
4. Define coefficient of friction and angle of repose.
5. Derive the equation for acceleration for a body in SHM.
6. The volume of air changes from 100 litres to 200 litres at a constant pressure of 10^5 N/m^2 . Find the work done.
7. Explain about phenomenon of beats.
8. Define surface tension and give example.
9. Two magnetic poles, each of strength 40 Am, are separated by distance of 20 cm in air. Find the force between them.
10. State the laws of photoelectric effect.

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PART—B

- 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.

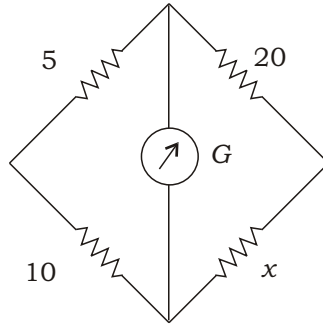
11. (a) State and explain the triangle law of vectors. 5
(b) Define dot product and vector product. Give one example each. 5
12. (a) Define an oblique projectile and show that the trajectory of oblique projection is parabola. 6
(b) A body is projected into air with velocity of 20 m/s and angle 30° with earth surface. Find the maximum height reached and time of ascent. ($g = 10 \text{ m/s}^2$) 4
13. (a) State and prove the law of conservation of energy in case of freely falling body. 8
(b) A stone of mass 10 kg falling freely from a height of 100 m. Find the kinetic energy on reaching the ground. 2
14. (a) Explain the experimental method of determination of acceleration due to gravity g using simple pendulum. 8
(b) Define seconds pendulum. How does its time period change with its length? 2
15. (a) State Boyle's law. 1
(b) Describe the experiment to verify Boyle's law. 9
16. (a) Derive the formula for apparent frequency when source is in motion towards observer at rest. 7
(b) Write the applications of Doppler effect. 3
17. (a) Define three types of modulus of elasticity and write their formulae. 6
(b) Define angle of contact and capillarity. 4

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- 18.** (a) Explain the working of Wheatstone bridge and derive its principle. 8
(b) In a Wheatstone bridge, three resistors are 5 Ω , 10 Ω and 20 Ω . Find the value of fourth resistor x , when the bridge is balanced. 2



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