

(6 pages)

Reg. No. :

Code No. : 30466 E Sub. Code : CNPH 31

U.G. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2024.

Third Semester

Physics

Non-Major Elective — BASIC PHYSICS — I

(For those who joined in July 2021 and 2022 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The unit of work is

- (a) Joule (b) Newton
(c) Watt (d) None of these

2. Momentum is a _____ quantity.

- (a) Vector (b) Scalar
(c) Both (a) and (b) (d) None of these

3. Thrust of the rocket is

- (a) $V_e \cdot \frac{dm}{dt}$ (b) $-V_e \cdot \frac{dm}{dt}$
(c) $\frac{dm}{dt}$ (d) $\frac{1}{\left(V_e \cdot \frac{dm}{dt}\right)}$

4. Bernoulli's theorem is based on

- (a) Conservation momentum
(b) Conservation of energy
(c) Conservation of mass
(d) Mass-energy equivalence

5. 1 calorie is equal to

- (a) 4.986 J (b) 4.286 J
(c) 4.186 J (d) 4.086 J

6. Audible range is

- (a) 10-1000 Hz (b) 10-10 kHz
(c) 20-20 kHz (d) None of these

7. The first invention of Alexander Graham Bell is

- (a) Radio (b) Photophone
(c) Telephone (d) None of these

8. Brewster's law is

- (a) $\mu = \tan \theta_p$ (b) $\mu = \cos \theta_p$
(c) $\mu = \sin \theta_p$ (d) None of these

9. S.I. unit of resistance is

- (a) Ohm (b) Mho
(c) Volt (d) Ampere

10. Another name of Kirchoff's I law

- (a) Kirchoff's Voltage Law
(b) Kirchoff's Current Law
(c) Kirchoff's Ampere Law
(d) None of these

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) State and explain Newton's second law for rotation.

Or

(b) Define : Angular momentum. Write an expression for it in vector form.

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12. (a) List the applications of a capillary rise.

Or

(b) Explain the variation of viscosity of a liquid with temperature.

13. (a) Write a short note on heat engines.

Or

(b) Write a short note on an efficiency of a heat engines.

14. (a) Define : Interference. State the condition of interference.

Or

(b) List the differences between interference and diffraction.

15. (a) Explain Ohm's law in vector form.

Or

(b) Explain Kirchoff's laws.

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PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Discuss an expression for the kinetic energy of a rotating body.

Or

- (b) State and explain Newton's II law.

17. (a) State and explain Bernoulli's theorem.

Or

- (b) Describe and explain the working of venturimeter.

18. (a) Describe with necessary theory, the construction and working of a diesel engine.

Or

- (b) Describe with necessary theory the construction and working of a steam engine.

19. (a) Discuss in detail with a diagram and working of convex and concave mirror.

Or

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- (b) Write a short note on :

- (i) Double refraction
- (ii) Optical activity and
- (iii) Quartz crystal.

20. (a) Define : Current and Ohm's law. Explain Ohm's law in vector form.

Or

- (b) State and explain Kirchoff's law.
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