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Reg. No. : .....

Code No. : 30746 E

Sub. Code : EMPH 31

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2024.

Third Semester

Physics — Core

MECHANICS

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. According to Kepler's second law, when the planet is nearer to the sun, it moves \_\_\_\_\_.  
(a) Faster (b) Slower  
(c) Rest (d) None
2. Escape velocity of earth is  
(a) 11.1 Km/s (b) 11.2 Km/s  
(c) 11.3 Km/s (d) 11.4 Km/s

3. Unit of angular momentum is
- (a)  $\text{Kg.ms}^{-1}$                       (b)  $\text{Kg.m}^2\text{s}^{-1}$   
(c)  $\text{Kg}^{-1}\text{m}^2\text{s}$                       (d)  $\text{Kg.m}^{-2}\text{s}^{-1}$
4. When two bodies stick together after collision, the collision said to be?
- (a) Partially elastic              (b) Elastic  
(c) Inelastic                      (d) None
5. Work is a \_\_\_\_\_ quantity.
- (a) Vector                      (b) Scalar  
(c) Both (a) and (b)              (d) None
6. Unit of energy is \_\_\_\_\_
- (a) Watt                      (b) Joule  
(c) Both (a) and (b)              (d) None
7. The rocket is based on the principle of law of conservation of \_\_\_\_\_.
- (a) energy  
(b) momentum  
(c) angular momentum  
(d) none

8. Moment of inertia is
- (a)  $L/W^2$  (b)  $L/W^3$   
(c)  $L/W$  (d) None
9. Virtual work of the force of constant is
- (a) 1 (b) 2  
(c) 3 (d) zero
10. D'Alembert principle is
- (a)  $F_i = \dot{P}_i$  (b)  $F_i = -\dot{P}_i$   
(c)  $F_i = \pm \dot{P}_i$  (d) None

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 law of motion.

Or

- (b) Explain equation of motion.

12. (a) Define : Collision. Explain elastic and inelastic collision.

Or

- (b) Define : angular momentum and torque show that the relation,  $\vec{T} = \vec{r} \times \vec{F}$ .

13. (a) Explain potential energy curve.

Or

(b) Explain conservative force with examples.

14. (a) Define : moment of inertia of a rotating body.  
State its significance.

Or

(b) Define : Collision. Discuss the direct impact of two bodies.

15. (a) Write a short note on :

(i) Degrees of freedom

(ii) Virtual work.

Or

(b) State the applications of Lagrange's equation.

**PART C — (5 × 8 = 40 marks)**

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write a short note on :

(i) Newton's laws

(ii) Kepler's laws.

Or

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- (b) Write a short note on :
- (i) Equation of motion
  - (ii) Newton's law of gravitation
  - (iii) Earth satellites.
17. (a) Define : center of mass. Calculate the total linear momentum of a system of particles about the centre of mass.

Or

- (b) Describe the law of conservation of linear momentum from Newton's laws of motion.
18. (a) Obtain to expression for the kinetic energy of a rotating body.

Or

- (b) Write a short note on :
- (i) work
  - (ii) power
  - (iii) energy
  - (iv) law of conservation of energy.

19. (a) Define moment of inertia. Write a short note on : (i) translational motion (ii) Rotational motion (iii) angular momentum.

Or

- (b) Obtain an expression for the acceleration of a body rolling down in an inclined plane.

20. (a) Discuss the applications of Lagrange's equation.

Or

- (b) Write a short note on :
- (i) D' Alembert's principle
  - (ii) Simple pendulum.
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Code No. : 30755 E

Sub. Code : ESPH 31

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2024.

Third Semester

Physics — Skill Enhancement Course

MAINTENANCE OF ELECTRICAL APPLIANCES

(For those who joined in July 2023 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. A multimeter can be used to measure \_\_\_\_\_
  - (a) Phase
  - (b) Pressure
  - (c) Resistance
  - (d) Volume
  
2. The 33 K $\Omega$  resistor has a color code \_\_\_\_\_
  - (a) orange yellow orange
  - (b) orange black orange
  - (c) orange orange orange
  - (d) orange orange red

3. Power consumption of a ceiling fan is typically \_\_\_\_\_
- (a) 40W (b) 40-50W  
(c) 60-70W (d) 10-120W
4. Filament of an electric bulb is made up of \_\_\_\_\_
- (a) tungsten (b) nichrome  
(c) silver (d) zinc
5. The capacity of a washing machine is expressed in \_\_\_\_\_
- (a) litre (b) meter<sup>3</sup>  
(c) kg (d) farad
6. The heating element in an electric water heater must have \_\_\_\_\_
- (a) high melting point  
(b) high resistivity  
(c) small temperature coefficient of resistance  
(d) all the above





10. What is the main purpose of an electrical switch?
- (a) To convert AC to DC
  - (b) To control the flow of electricity
  - (c) To convert DC to AC
  - (d) To measure the current flow

PART B — (5 × 5 = 25 marks)

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

11. (a) Write a short note on voltmeter.

Or

- (b) List out the uses of transformers.

12. (a) Explain the principle and working of an electric bulb.

Or

- (b) Write a short note on mixie.

13. (a) Explain electrical circuit overloading.

Or

- (b) Give the principle of water pump motor.

14. (a) Write a note on room heater.

Or

(b) Explain the working principle of rice cooker.

15. (a) Discuss about the Residual Current Circuit Breaker (RCCB).

Or

(b) What are fuses? How do they functioning?

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Describe the construction and working of a galvanometer.

Or

(b) Describe about the different types of capacitors.

17. (a) Explain the working principle of LED lamps.

Or

(b) With a neat sketch, explain the construction and working of an electric fan.

18. (a) Explain the principle and working of storage and instant type water heater.

Or

(b) Give the purpose of doing earthing. Explain different method of earthing.

19. (a) Explain in detail, electric toasters.

Or

(b) Describe about the electric iron and immersion rod.

20. (a) Describe about a ground fault protection method.

Or

(b) Explain the working principle of ELCB.

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Sub. Code : CNPH 32

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

Third Semester

Physics

Non-Major Elective — APPLIED PHYSICS

(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. Energy – mass relation is

(a)  $E = m^2 c^2$

(b)  $E = mc^2$

(c)  $E = m^3 c^2$

(d)  $E = mc$

2. LPG means

(a) Liquefied Petroleum Gas

(b) Liquefied Feltier Gas

(c) Liquid Petrol Gas

(d) Liquid Petal Gas

3. The major constituents of natural gas is
- (a) Methane                      (b) Ethane  
(c) Propane                      (d) Ethylene
4. Coal is a
- (a) Pollution                      (b) Pollutant  
(c) Solid                      (d) None of the above
5. Methane is a \_\_\_\_\_ gas.
- (a) clean                      (b) impure  
(c) polluted                      (d) pure
6. Digestion is a \_\_\_\_\_ process.
- (a) chemical                      (b) physical  
(c) biological                      (d) technical
7. The first solar pond was constructed in
- (a) India                      (b) Israel  
(c) Iran                      (d) Iraq
8. Solar cell is a \_\_\_\_\_ diode.
- (a) p-n junction                      (b) p-p junction  
(c) n-n junction                      (d) None of the above



13. (a) Define : Biomass energy. Classify Biomass energy. Discuss anyone method of biomass energy.

Or

- (b) Explain biogas plant.

14. (a) Write a short note on :

- (i) Solar water heater  
(ii) Solar cell.

Or

- (b) Discuss solar green house.

15. (a) Discuss in detail the concept of geothermal energy.

Or

- (b) Explain the working principle of a windmill.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)

Each answer should not exceed 600 words.

16. (a) Describe the major sources of conventional energy.

Or

- (b) Describe how coal is used as sources of energy.



17. (a) Describe how coal is processed as sources of energy.

Or

(b) Discuss the applications, merits and demerits of fossil fuels.

18. (a) Discuss in detail aspects of Deen Bandhu Model gas plant.

Or

(b) Explain Biomass energy. State its advantages and disadvantages.

19. (a) Define : Solar energy. Explain its importance, principle, working, applications of solar energy.

Or

(b) Write a short note on :

(i) Solar Crop dryers

(ii) Solar Cookers.

20. (a) Describe the open cycle Ocean Thermal Energy Conversion (OTEC) system with its advantages.

Or

(b) Describe the power plant used to obtain tidal energy. Explain its working in detail.

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