

QP CODE: 24900203



Reg No:.....

Name:.....

**MAHATMA GANDHI UNIVERSITY, KOTTAYAM**  
**FIRST SEMESTER MGU-UGP (HONOURS) REGULAR**  
**EXAMINATION NOVEMBER 2024**

**First Semester**

**Discipline Specific Core Course - MG1DSCPHY100 - FOUNDATIONS OF PHYSICS**

(2024 ADMISSION ONWARDS)

Duration: 1.5 Hours

Maximum Marks: 50

**Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Interest (I),  
Appreciation (Ap), and Skill (S)**

*Students should attempt atleast one question from each course outcome to enhance their overall  
outcome attainability.*

[Learning Domain][CO No(s)]

**Part A**

Short Answer Type Questions

Answer any 7 questions

Each question carries 2 marks

- |   |   |      |     |
|---|---|------|-----|
| 1 | Convert a) 10 nanometres (nm) to meters (m). (b) 10 meters (m) to micrometres ( $\mu\text{m}$ ).  | [U]  | [1] |
| 2 | Two vectors A and B are Parallel. What will be their vector product and scalar product?   | [A]  | [1] |
| 3 | Differentiate between average acceleration and instantaneous acceleration.  | [U]  | [2] |
| 4 | What is the horizontal component of velocity in projectile motion?  | [U]  | [3] |
| 5 | How is acceleration related to velocity of a particle? Will the acceleration of a particle become zero when it moves with a constant speed along a curved path? | [U]  | [3] |
| 6 | A car is initially moving in reverse. The driver applies brakes, slowing the car. What is the direction of car's acceleration, relative to the car?             | [An] | [3] |
| 7 | What is the power delivered when work of 1000 J is done in 2 seconds  | [A]  | [4] |

- 8 What is the difference between positive work and negative work? [U] [4]
- 9 Assume that the earth moves around the sun in a circular orbit. Does the sun do any work on the earth? [An] [4]
- 10 Write the syntax of if else statements in Python. [K] [5]

(7 × 2 = 14)

### Part B

Short Essay Type Questions

Answer any 4 questions

Each question carries 6 marks

- 11 Sketch and show the resultant R of vector sum of A and B. [U] [1]
- 12 A cheetah is found at 20 m to the east of a vehicle. At time  $t = 0$ , it begins to run due east towards its prey which is at 50 m to the east of the vehicle. During the first 2.0 s of the chase, the Cheetah's x- coordinate varies with the time according to the equation  $x = 20\text{m} + (5\text{m/s}^2)t^2$ . Find the Cheetah's instantaneous velocity at  $t_1 = 1$  s by taking,  $\Delta t = 0.1$  s, then 0.01 s and 0.001 s. [A] [2]
- 13 An iceboat is at rest on a frictionless horizontal surface. Due to the blowing wind, 4.0 s after the iceboat is released, it is moving to the right at 6.0 m/s (about 22 km/h, or 13 mi/h). What constant horizontal force does the wind exert on the iceboat? [A] [3]
- 14 Discuss the transfer of energy in trampoline jumping. [An] [4]
- 15 What is the work done by a constant force? [U] [4]
- 16 Write a Python program to determine if a given number is positive, negative, or zero. [A] [5]

(4 × 6 = 24)

### Part C

Essay Type Questions

Answer any 1 question

Each question carries 12 marks

- 17 Explain the operators in Python and their rules of precedence. [U] [4]
- 18 Give a detailed account on errors in python programming. [K] [5]

(1 × 12 = 12)

**END OF THE QUESTION PAPER**

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