

BACHELOR'S DEGREE EXAMINATION, OCTOBER 2025
2025 ADMISSIONS REGULAR
SEMESTER I - MINOR - C (PHYSICS)
PH1DSCB101B24 - FOUNDATIONS OF PHYSICS

Time : 1.5 Hours

Maximum Marks : 50

Part A

Answer all questions. Each question carries 1 mark. (1x10=10)

1. What length restrictions are required for three vectors to have a vector sum of zero? [CO1,Apply]
2. Using two arbitrary vectors, demonstrate the polygon and parallelogram laws of vector addition. [CO1,Apply]
3. With a brief description, list out the steps involved in solving a physics problem. [CO1,Understand]
4. For an object to be in equilibrium, the net external force acting on it should be [CO2,Understand]
5. Define one Newton. [CO3,Understand]
6. Give an example of a non-conservative force. [CO3,Understand]
7. Define one horse power (hp). [CO3,Understand]
8. Which is the function is used to find the length of a list in python? [CO4,Understand]
9. Mention how the operator '=' differs from the operator '==' in python. [CO4,Understand]
10. Give the result of the expression $3^{**}2 + 5$ in python programme. [CO4,Understand]

Part B

Answer any 2 questions from the bunch of CO1. Each question carries 5 mark. (5x2=10)

11. A circular race track has a radius of 500 m. What is the displacement of a bicyclist when she travels around the track from the north side to the south side? Also, when she makes one complete circle around the track? Explain. [CO1,Apply]
12. (i) A juggler throws a bowling pin straight up with an initial speed of 8.20 m/s. How much time elapses until the bowling pin returns to the juggler's hand? (ii) A sprinter runs a 100 m dash in 12.0 s. She starts from rest with a constant acceleration 'a' for 3.0 s and then runs with constant speed for the remainder of the race. What is the value of a? [CO1,Apply]
13. A cyclist going around a circular track at 10.0 m/s has a centripetal acceleration of 5.00 m/s². What is the radius of the curve? [CO1,Apply]

Part B

Answer any 2 questions from the bunch of CO3. Each question carries 5 mark. (5x2=10)

14. A body of mass 1 kg is moving with velocity 4 m/s. A force of 2 N is applied on it in the direction of motion for 5 m.
 - (i) Calculate the work done by the force.
 - (ii) Find the increase in kinetic energy.
 - (iii) Verify the Work–Energy Theorem. [CO3,Apply]
15. Derive a formula for instantaneous power for a force doing work on a body. [CO3,Understand]
16. Write a short note on energy diagrams and draw the energy diagram of an object acted upon by an elastic force. [CO3,Understand]

Part B

Answer any 2 questions from the bunch of CO4. Each question carries 5 mark. (5x2=10)

17. Write a programme to find out if the entered number is Positive, Negative, or 0 on Python. [CO4,Apply]

18. Write a programme to add 2 numbers entered on Python.

[CO4,Apply]

19. Write a note on the characteristics of python language.

[CO4,Understand]

Part C

Answer any 1 question from the bunch of CO2. Each question carries 10 mark.

(10x1=10)

20. (a) Differentiate between *mass* and *weight* with suitable examples. (b) A block of mass 5kg is placed on a horizontal surface. Calculate its weight. If the block exerts a force on the surface, what is the magnitude and direction of the reaction force? [CO2,Understand]
21. Discuss the different types of forces in physics. Explain with suitable everyday examples how forces always arise due to interactions between objects. [CO2,Understand]