

QP CODE 2010551304

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DMI-ST. EUGENE UNIVERSITY

ZAMBIA

DEGREE EXAMINATION – JUNE 2024

Semester: I

055 PH 13 PHYSICS I

Time: 3:00 Hours

Max. Marks: 100

Answer any FIVE Questions (5 x 20 = 100 Marks)

1. a) Define unit. What are the types of physical quantities? (5 Marks)
b) Explain in detail the various types of errors. Define precision and accuracy, Explain with one example. (10 Marks)
c) Write the rules for determining significant figures. (5 Marks)
2. a) What is work done? In which cases the work done is zero? (5 Marks)
b) Define work done by a constant force. State and prove work kinetic energy theorem. (10 Marks)
c) An object of mass 2 kg falls from a height of 5 m to the ground. What is the work done by the gravitational force on the object? (Neglect air resistance; Take $g = 10\text{ms}^{-2}$) (5 Marks)
3. a) What is frame of reference? Discuss the displacement time graph. (8 Marks)
b) Briefly explain the newton's three laws. (4 Marks)
c) Difference between distance and displacement. An athlete covers 3 rounds on a circular track of radius 50 m. Calculate the total distance and displacement travelled by him. (8 Marks)
4. a) Define center of mass. (5 Marks)
b) What are the conditions in which force cannot produce torque? (5 Marks)
c) State and prove parallel axis theorem. (10 Marks)
5. a) Derive the Bernoulli's theorem. (10 Marks)
b) What is viscosity? Discuss about stokes law. (10 Marks)
6. a) If the value of universal gravitational constant in SI is $6.6 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$, then find its value in CGS System? (10 Marks)
b) Write the dimensional formula for Energy, velocity, acceleration, impulse, momentum.

(10 Marks)

7. a) What is Scalar Product? Discuss the properties of scalar product. **(10 Marks)**
b) Arrive at an expression for elastic collision in one dimension and discuss various cases.

(10 Marks)