



BRAINWARE UNIVERSITY

Term End Examination 2023-2024

Programme – Dip.EE-2022

Course Name – Elements of Mechanical Engineering

Course Code - DEEPC305

(Semester III)

Full Marks : 30

Time : 1:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 5=5

1. Choose the correct alternative from the following :

- (i) Select which of the following statements best defines the first law of thermodynamics.
- a) Heat always flows from a hot object to a cold object.
 - b) Energy cannot be created or destroyed, only converted from one form to another.
 - c) The entropy of a system always decreases over time.
 - d) The volume of a gas is inversely proportional to its pressure at constant temperature.
- (ii) If a gas is compressed while its temperature remains constant, identify what happens to its internal energy from the following,
- a) It increases.
 - b) It decreases.
 - c) It remains the same.
 - d) It cannot be determined from the given information.
- (iii) A piston-cylinder system contains 0.5 moles of an ideal gas. If the gas is expanded isothermally at constant temperature, select what happens to its pressure from the following
- a) It increases.
 - b) It decreases.
 - c) It remains the same.
 - d) It depends on the type of gas used.
- (iv) Two containers, A and B, are filled with the same ideal gas at the same temperature and pressure. Container A has a volume of 1 liter, while container B has a volume of 2 liters. Select from the options how do the gas densities in the two containers compare from the following.
- a) The gas density in container A is half that of container B.
 - b) The gas density in container A is the same as container B.
 - c) The gas density in container A is double that of container B.
 - d) The gas density in container A is four times that of container B.
- (v) Determine if temperature of the source is increased, the efficiency of the Carnot engine
- a) Increase
 - b) Decrease
 - c) Remains constant
 - d) First increases and then becomes constant