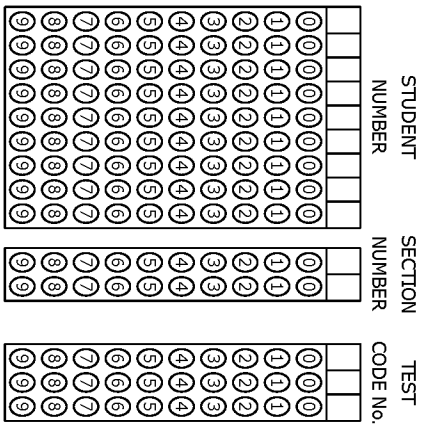
KFUPM	Phys102-242	Quiz-0213
Physics Department	Sec:04-05-06	13-Feb-2025

NAME _____

STUDENT No. _____

SECTION No. _____



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1 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	26 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	51 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	76 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	101 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
2 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	27 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	52 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	77 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	102 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
3 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	28 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	53 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	78 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	103 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Q1. 11.1 moles of an ideal gas, initially at 126 °C are taken through an isothermal process in which the volume of the gas doubles. What is the work done by the gas during this process in the units of kJ?

A) 25.5
B) 8.06
C) 11.1
D) 3.50
E) 34.7

$$W = nRT \ln \frac{V_f}{V_i}$$
$$= 11.1(8.31)(126+273)\ln 2$$
$$= 25.5 \text{ kJ}$$

Q2. 7.30 moles of monatomic gas are initially at a temperature of 132 °C. The gas is expanded at constant pressure until its volume is doubled. Find the change in the internal energy in the units of kJ.

A) 61.4
B) 36.9
C) 12.0
D) 20.0
E) 27.6

$$\Delta E_{int} = nC_V \Delta T = \frac{3}{2} nR\Delta T$$
$$pV = nRT \Rightarrow p\Delta V = nR\Delta T$$
$$\Delta E_{int} = \frac{3}{2} p\Delta V = \frac{3}{2} \frac{nRT_i}{V_i} (V_f - V_i), \quad V_f = 2V_i$$
$$= \frac{3}{2} nRT_i = \frac{3}{2}(7.30)(8.31)(132+273.15)$$
$$= 36.9 \text{ kJ}$$

23 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	48 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	73 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	98 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	123 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
24 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	49 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	74 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	99 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	124 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
25 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	50 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	75 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	100 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ	125 Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ