APPENDIX – V
SAMPLE QUESTIONS

PHYSICS

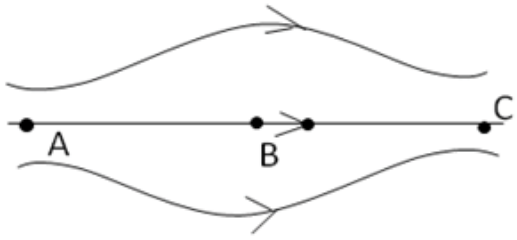
1. If a force $F = (2x + 3x^2)\hat{i}$ N acts along x-axis on an object and moves it from x = 2m to x =4m, the work done is

   A) 24 J B) 68 J C) 86 J D) 142 J

2. A vessel contains 1 mol of O_2 and 2 mol of He. What is the value of 'C_P/C_V' of the mixture?

   A) 17/11 B) 71/45 C) 38/15 D) 46/15

3. Figure shows some of the electric field lines corresponding to an electric field. The figure suggests that



   A) $E_A > E_B > E_C$ B) $E_A = E_B = E_C$ C) $E_A = E_C > E_B$ D) $E_A = E_C < E_B$

4. A carbon resistor has color code as, Red, Black, Blue and Gold. The resistance and tolerance values are

   A) 20 MΩ ±5% B) 20 MΩ ±10% C) 20 kΩ ±5% D) 20 kΩ ±10%

5. A small circular flexible loop of wire of radius *r* carries a current *I*. It is placed in a uniform magnetic field *B*. The tension in the loop will be doubled if

   A) *I* is doubled B) *B* is halved C) *r* is doubled D) Both *B* and *I* are doubled

6. What is the self-inductance of a coil when a change of current from 0 to 2 A in 0.05 s induces an *emf* of 40 V in it?

   A) 1 H B) 2 H C) 3 H D) 4 H

7. A light has the wavelength 6000 Å in air and 4500 Å in water. Then the speed of light in water will be

   A) 5.0×10^{14} m/s B) 2.25×10^{8} m/s C) 4.0×10^{8} m/s D) 1.0×10^{8} m/s

8. In which of the following transitions in hydrogen atom will the wavelength be minimum?

   A) n = 5 to n = 4 B) n = 4 to n = 3 C) n = 3 to n = 2 D) n = 2 to n = 1

9. One gram of Radium, with atomic weight 226, emits 4×10^{10} particles per second. The half-life of Radium is

   A) 4.6×10^{10} s B) 4.6×10^{9} s C) 4.6×10^{12} s D) 4.6×10^{14} s

10. The minimum number of NAND gates required to implement $A + A\overline{B} + A\overline{B}C$ is

    A) 3 B) 2 C) 6 D) zero