MODEL QUESTIONS – PHYSICS

1. A particle starts from origin at t=0 with a velocity of 10 **i** m/s and moves in x-y plane under the action of force which produces a constant acceleration of $(2i + 3j)$ m/s^2. The y – coordinate of the particle at the instant its x-coordinate becomes 24m
(1) 12m (2) 6m (3) 18m (4) 3m

2. When 0.2 kg of ice at 0^0 C mixed with 0.5 kg of water at 60 ^{0} C in a container, the resulting temperature is 10 ^{0}C. The heat of fusion of ice (S_{water} = 4186 J/kg/K)
(1) 1.31 X 10^5 J/kg (2) 2.62 X 10^5 J/kg
(3) 10.46 X 10^5 J/kg (4) 5.23 X 10^5 J/kg

3. Statement (A): When Zener diode is connected in reverse bias it acts as a voltage regulator.
Statement (B): Photodiode is operated in reverse biased condition.
Statement (C): No external bias is applied to the solar cell.
(1) A, B, C are TRUE (2) Only A & C are TRUE
(3) Only A & B are TRUE (4) Only B & C are TRUE

4. A solenoid of length 1.0m has a radius of 1cm and is made up of 1000 turns. It carries a current of 2.5 A. The magnitude of the magnetic field inside the solenoid in Tesla is
(1) π x 10^{-3} (2) π x 10^{-4} (3) π x 10^{-6} (4) π x 10^{-5}

5. Assertion: Artificial satellite does not require any fuel while it revolves around the earth's orbit.
Reason: Earth provides the necessary centripetal force for the satellite to move in its orbit.
(1) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(2) Both Assertion and Reason are true But Reason is not the correct explanation of Assertion.
(3) Assertion is true but Reason is false
(4) Both Assertion and Reason are false

6. Match the following physical quantities with their correct dimensional formula

List-I	**List-II**
(a) Gravitational constant	(i) $M^1 L^2 T^{-1}$
(b) Angular Momentum	(ii) $M^1 L^1 T^{-3} K^{-1}$
(c) Coefficient of thermal conductivity	(iii) $M^{-1} L^3 T^{-2}$
(d) Power of lense	(iv) $M^0 L^1 T^0$

	(a)	(b)	(c)	(d)
(1)	(ii)	(i)	(iii)	(iv)
(2)	(iii)	(ii)	(iv)	(i)

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(3)	(ii)	(iii)	(i)	(iv)
(4)	(iii)	(i)	(ii)	(iv)

MODEL QUESTIONS – CHEMISTRY

1. Ionization enthalpies (kJ/mole) of Li, Be, B and C are
   (1) 520, 801, 899, 1086
   (2) 1086, 899, 801, 520
   (3) 520, 899, 801, 1086
   (4) 801, 520, 899, 1086

2. Which of the following statements is not true?
   (1) Bond order of N_2 is 3
   (2) B_2 is paramagnetic
   (3) SO_2 molecule is linear
   (4) Hybridisation of B in BCl3 is sp^2

3. Which of the following is/are more acidic than phenol?
   (a) C_2H_2 (b) C_2H_5OH (c) CH_3COOH (d) CH_3CHO
   (1) a and b
   (2) c and d
   (3) only b
   (4) only c

4. Assertion (A): Carbonyl compounds undergo nucleophilic addition reactions.
   Reason (R): Carbonyl group is non-polar.
   The correct answer is:
   (1) Both (A) and (R) are true and (R) is the correct explanation of (A)
   (2) Both (A) and (R) are true and (R) is not the correct explanation of (A)
   (3) (A) is true but (R) is not true
   (4) (A) is not true but (R) is true

5. Match the following:

LIST I	LIST II
(A) Packing efficiency in ccp structure	(i) 2
(B) Number of atoms in bcc unit cell	(ii) 4
(C) Packing efficiency in simple cubic structure	(iii) 52.4%
(D) Number of atoms in fcc unit cell	(iv) 68.0%
	(v) 74.0%

   The correct answer is:

	(A)	(B)	(C)	(D)
(1)	v	iv	iii	ii
(2)	iii	ii	i	iv
(3)	v	i	iii	ii
(4)	iv	i	ii	iii

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