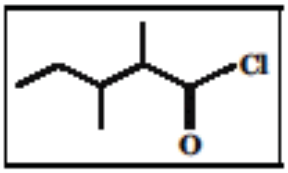
1. The IUPAC name of



is:

(A) 2-ethyl-3-methyl butanoyl chloride
(B) 1-chloro-1-oxo- 2, 3-dimethyl pentane
(C) 2,3 dimethyl pentanoyl chloride
(D) 3,4 dimethyl pentanoyl chloride

2. Assertion (A): Alkali metals impart colour to the flame.
Reason (R): Their ionization energies are low.
(A) Both 'A' and 'R' are true and 'R' is the correct explanation of 'A'.
(B) Both 'A' and 'R' are true but 'R' is not the correct explanation of 'A'.
(C) 'A' is true and 'R' is false.
(D) 'A' is false and 'R' is true.

3. Which of the following is a redox reaction?
(A) $CaC_2O_4 + 2HCl \longrightarrow CaCl_2 + H_2C_2O_4$
(B) $Mg(OH)_2 + 2NH_4Cl \longrightarrow MgCl_2 + NH_4OH$
(C) $Zn + 2AgCN \longrightarrow 2Ag + Zn(CN)_2$
(D) $NaCl + KNO_3 \longrightarrow NaNO_3 + KCl$

4. ΔH and ΔS for the reaction are + 30.558 kJ mol^{-1} and 0.066 kJ mol^{-1} at 1 atm pressure. The temperature at which free energy is equal to zero and the nature of reaction below this temperature are:
(A) 483 K, spontaneous (B) 443 K, non-spontaneous (C) 443 K, spontaneous (D) 463 K, non-spontaneous

5. What transition in He^+ ion shall have the same wave number as the first line in Balmar series of H atom?
(A) $7 \longrightarrow 5$ (B) $4 \longrightarrow 2$ (C) $6 \longrightarrow 4$ (D) $5 \longrightarrow 3$

1. Study the relationship between the figures in Set I and find the missing figure in Set II?

I II

(A)  (B)  (C)  (D) 

2. The Simla Pact between India and Pakistan was signed by:

(A) Indira Gandhi and Zia-ul-Haq (B) Lal Bahadur Shastri and Ayub Khan
(C) Indira Gandhi and Zulfikar Ali Bhutto (D) Rajiv Gandhi and Benazir Bhutto

3. Which of the cities listed below is scheduled to host the 19th Commonwealth Games in 2010?

(A) Kula Lumpur (B) Bangkok (C) Victoria (D) New Delhi

4. What does the term 'pixel' as used in digital images stand for?

(A) Format (B) Resource Locator (C) Picture element (D) None of these

5. What is the duration of the zero hour in the Lok Sabha?

(A) 15 minutes (B) Half an hour (C) One hour (D) Not specified

1. **Let S be a set with 100 elements. How many subsets does S have which contain atleast 50 elements?**

(A) $\frac{2^{100}}{2}$ (B) $\frac{2^{100} - {}^{100}C_{50}}{2}$ (C) $2^{99} + \frac{{}^{100}C_{50}}{2}$ (D) ${}^{100}C_{50}$

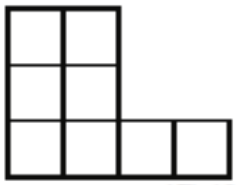
2. **The equation $Z\bar{Z} + (4-3i)Z + (4+3i)\bar{Z} + 5 = 0$ represents a circle whose radius is _____**

(A) $2\sqrt{5}$ (B) 5 (C) $\frac{5}{2}$ (D) 1

3. **In a 12 storey building 3 persons enter a lift cabin. It is known that they will leave the lift at different storeys. In how many ways can thy do so if the lift does not stop at the second storey?**

(A) 720 (B) 240 (C) 120 (D) 36

4. **In how many ways the letters of the word "NATION" can be placed in the squares of the following figure so that no row remains empty?**



(A) 6! (B) 18700 (C) 18720 (D) 8!

5. **The natural numbers are grouped as indicated:**
{1}, {2, 3}, {4, 5, 6}, {7,8,9,10}, ... with "m" numbers in the m^{th} group. Find the sum of the numbers in the 110^{th} group.

(A) 665,555 (B) 55,555 (C) 450,000 (D) 700,565

1. **The moment of inertia of a uniform circular disc of radius R and mass M about an axis touching the disc at its diameter end and normal to the disc is.**

(A) $\frac{MR^2}{2}$ (B) MR^2 (C) $\frac{2}{5}MR^2$ (D) $\frac{3}{2}MR^2$

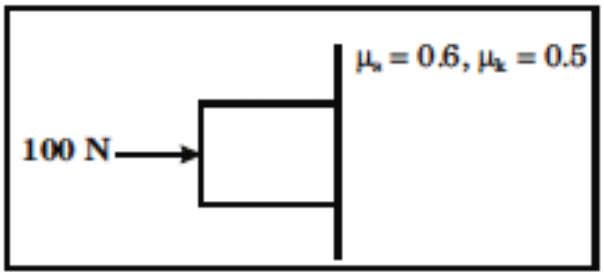
2. **If 'h' is the height of capillary rise and 'r' be the radius of capillary tube, then which of the following relation will be correct?**

(A) $hr = \text{constant}$ (B) $\frac{h}{r^2} = \text{constant}$ (C) $hr^2 = \text{constant}$ (D) $\frac{h}{r} = \text{constant}$

3. **A man of mass 60 kg stands on the floor of a lift which is accelerating downwards at 1 m/s². Then, the reaction of the floor of the lift on the man is:** ***(Take g = 10 m/s²)***

(A) 528 N (B) 600 N (C) 540 N (D) 546 N

4. **A block of mass 3 kg is pressed against a rough wall as shown in the figure.**

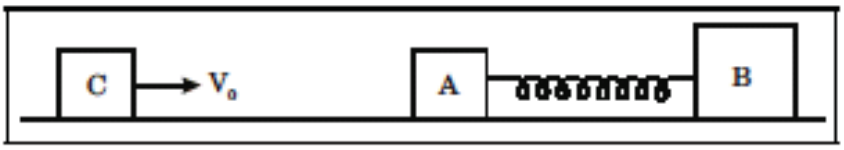


The friction force between the wall and the block is:

(Take g = 10 m/s²)

(A) 60 N (B) 50 N (C) 30 N (D) 20 N

5. **A block C of mass 'm' is moving with velocity v_0 and collides elastically with block A of mass 'm' and connected to another block B of mass 2 m through spring of spring constant 'k'. What is 'k' if x_0 is compression of spring, when velocity of A and B is same?**



(A) $\frac{mv_0^2}{x_0^2}$ (B) $\frac{mv_0^2}{2x_0^2}$ (C) $\frac{3}{2}\frac{mv_0^2}{x_0^2}$ (D) $\frac{2}{3}\frac{mv_0^2}{x_0^2}$