Sample Entrance Exam Questions

Physics

1. Consider two satellites S_1 and S_2 with periods of revolution 1 hr and 8 hr respectively revolving around a planet in circular orbits. The ratio of angular velocity of satellite S_1 to the angular velocity of satellite S_2 is:

    (a) 8:1
    (b) 2:1
    (c) 1:4
    (d) 1:8

2. If momentum P, area A and time T are taken as fundamental quantities, then the dimensional formula for coefficient of viscosity is:

    (a) $PA^{-1}T^0$
    (b) PAT^{-1}
    (c) $PA^{-1}T$
    (d) $PA^{-1}T^{-1}$

3. A planet has double the mass of the earth. Its average density is equal to that of the earth. An object weighing W on earth will weigh on that planet:

    (a) $2^{\frac{1}{4}}W$
    (b) $2^{\frac{1}{3}}W$
    (c) $2W$
    (d) $2^{\frac{2}{3}}W$

Chemistry

4. Consider the elements Mg, Al, S, P and Si, the correct increasing order of their first ionisation enthalpy is:

    (a) $Al < Mg < Si < S < P$
    (b) $Al < Mg < S < Si < P$
    (c) $Mg < Al < Si < P < S$
    (d) $Mg < Al < Si < S < P$

5. The photochemical smog does not generally contain:

    (a) NO

(b) NO_2

(c) SO_2

(d) HCHO

6. During the denaturation of proteins, which of these structures will remain intact?

   (a) Primary

   (b) Secondary

   (c) Tertiary

   (d) Quarternary

7. The setting time of Cement is increased by adding:

   (a) Clay

   (b) Silica

   (c) Gypsum

   (d) Limestone

Mathematics

8. A scientific committee is to be formed from 6 Indians and 8 foreigners, which includes at least 2 Indians and double the number of foreigners as Indians. Then the number of ways, the committee can be formed, is:

   (a) 1050

   (b) 1625

   (c) 575

   (d) 560

9. If $\alpha, \beta, \gamma, \delta$ are the roots of the equation $x^4+x^3+x^2+x+1=0$, then $\alpha^{2021}+\beta^{2021}+\gamma^{2021}+\delta^{2021}$ is equal to:

   (a) 4

   (b) 1

   (c) -4

   (d) -1

10. The sum of the first 20 terms of the series $5 + 11 + 19 + 29 + 41 + ...$ is:

    (a) 3520

    (b) 3450

    (c) 3250

    (d) 3420