

Mathematics

1. When 4 dice are thrown, what is the probability that the same number appear on each of them?
(a) $1/36$ (b) $1/216$ (c) $1/64$ (d) $1/18$

2. If we evaluate the sequence $S = 1 + (1/2) + (1/3) + (1/4) + (1/5) + \dots + (1/1000)$ the sum will be closest to
(a) Infinity (b) 1000 (c) 10 (d) 100

3. The slope of the tangent to the parabolic curve $y = 2x^2$ at $x=3$ is equal to
(a) 18 (b) 22 (c) 0.12 (d) 12

4. A cylinder of length L and cross sectional radius R has same volume as a sphere of radius R . The relationship between R and L can be written as
(a) $3L = 4R$ (b) $4L = 3R$ (c) $L = R$ (d) $L = -R$

5. Four objects (A,B,C and D) are placed in these ways ----- B is toward east of C at a distance of 10cm, A is at a distance of 10cm. toward east of D but at a distance of 15cm, toward south of B. If the distance of D from C is also 15cm. to which side of C does it lie ?
(a) North (b) South-East (c) South-West (d) South

6. Using the numbers 2,4,6 and 8, how many 3 digit numbers can we create, if we allow repeats?
(a) 32 (b) 64 (c) 12 (d) 384

Physics

1. The quantity that is measured in a calorimetric study is

- a) energy stored in food substances b) heat c) color d) wavelength 2.

Which of the following does not describe a property of transverse waves

- a) Wavelength b) phase c) decibel d) path difference

3. While viewing a ship approaching from a distance in the middle of a sea, the top portion of the ship is visible first and then the rest of it, from top to bottom. This observation proves that

- a) gravity does not exist in the sea b) the sky acts as a concave lens
c) the earth is round d) parallel lines meet at infinity

4. The effect of three point charges on a test charge at a distance is 'd' from the centroid of the charges will be a/an ____ of the effects of individual charges

- a) vector addition b) algebraic addition c) scalar triple product d) independent

5. When a semiconductor is heated, its electrical conductivity ____

- a) decreases b) increases c) remains the same d) becomes infinite

6. Which of the following is an ionizing radiation

- a) gamma rays b) visible light c) microwave d) oceanic waves

Chemistry

1. In the crystalline form of sodium chloride, one Na^+ ion is surrounded by

- (a) 1 Cl^- ion (b) 4 C^- ions (c) 1 Cl^+ ion (d) 6 Cl^- ions

2. Find empirical formula of the compound if M=68% (atomic mass=34) and remaining 32% is oxygen

- (a) Rhizobium
- (b) Protists
- (c) Blue-green algae
- (d) slime moulds

5. What is the major contribution of Gregor Johann Mendel?

- (a) Laws of inheritance
- (b) Laws of evolution
- (c) Laws of genomics
- (d) Laws of gravity

6. A secondary growth of stems in plants involves:

- (a) phloem companion cell migration
- (b) vascular cambium
- (c) xylem degradation
- (d) death of meristematic cells