1 MARK EACH

MATHEMATICS

1.

Let ABC be triangle with $AB = AC = 6$. If the circumradius of the triangle is 5, then BC equals

A $25/3$ B 9 C $48/5$ D 10

2.

A certain school has 300 students. Every student reads 5 newspapers and every newspaper is read by 60 students. Then the number of newspapers

A is at least 30 B is at most 20

C is exactly 25 D cannot be determined by the data

PHYSICS

1.

A fully loaded elevator has a mass of 6000 kg. The tension in the cable as the elevator is accelerated downward with an acceleration of 2 ms^{-2} is (Take g $= 10$ms^{-2})

A 7.2 x 10^4 N   B 4.8 x 10^4 N   C 6 x 10^4 N   D 1.2 x 10^4 N

2.

A physical quantity that is conserved in a process

A   must have the same value for all observers.

B   can never take negative values.

C   must be dimensionless.

D   need not necessarily be a scalar.

CHEMISTRY

1.

The compound having a triple bond is

A Benzene **B** Cyclohexane **C** Acetylene **D** Glucose

2.

The reaction $ZnO + C \rightarrow Zn + CO$ is an example of a

A Combination reaction **B** Reduction-oxidation reaction

C Displacement reaction **D** Decomposition Reaction

BIOLOGY

1.

In a wound, 'pus' is a,

A A mixture of destroyed germs, killed leucocytes and damaged tissue cells

B Concentrated blood plasma

C Thick mucus secretion

D Concentrated secretion of the sebaceous gland

2.

Which of the following is a bacterial disease ?

A Smallpox **B** Measles **C** Meningitis **D** Rabies

MATHEMATICS

1.

The number of distinct pairs (x, y) of the real numbers satisfying $x = x^3 + y^4$ and $y = 2xy$ is

A 5   B 12   C 3   D 7

2.

Consider the triangle OAB in the xy-plane where $O = (0,0)$, $A = (6,0)$, $B = (\sqrt{2}, 3)$. A square $PQRS$ is inscribed in the square with P, Q on OA, R on AB and S on BO. Then the side of the square equals

A $3/\sqrt{2}$ B $\dfrac{9}{4}$ C $\dfrac{3}{2}\sqrt{\dfrac{5}{2}}$ D 2

PHYSICS

1.

The rear wheels of a car are turning at an angular speed of 60 rad/s. The brakes are applied for 5s, causing a uniform angular retardation of 8 rads^{-2}. The number of revolutions turned by the rear wheels during the braking period is about

A   48   B   96   C   32   D   12

2.

In aerial mapping a camera uses a lens with a 100 cm focal length. The height at which the airplane must fly, so that the photograph of a 1 km long strip on the ground fits exactly on the 20 cm long filmstrip of the camera, is:

A   200 km   B   20 km   C   5 km   D   1 km

CHEMISTRY

1.

A 3 N solution of H_2SO_4 in water is prepared from Conc. H_2SO_4 (36 N) by diluting

    A   20 ml of the conc. H_2SO_4 to 240 ml

    B   10 ml of the conc. H_2SO_4 to 240 ml

    C   1 ml of the conc. H_2SO_4 to 36 ml

    D   20 ml of the conc. H_2SO_4 to 36 ml

2.

A sample of water was checked for suitability for drinking and was subjected to a chemical test. Pure Zinc granules and sulphuric acid was added to the water sample. The effervescence that resulted from the reaction was bubbled through a tube containing lead acetate solution. A black precipitate appeared. The outgoing gas was subsequently passed through a heated glass tube, a black mirror appeared on the wall of the tube. The first and second black substances, respectively, are

A	HgS and CuS	**B**	PbS and CuS
C	As and Hg	**D**	PbS and As

BIOLOGY

1.

A swimmer crossing the British channel after 2 hrs of vigorous swimming experiences severe muscle cramps and is forced to discontinue. Which of the following options given below could give rise to this problem

A	Muscle tear	**B**	Sea water diffusion into muscles
C	Bite of pirranahs	**D**	Lactic acid accumulation

2.

Partial removal of liver is not harmful because

A Liver being a large organ can suffice the functions even if a part is removed

B Liver is not a very essential organ of the body

C Liver has regenerative capacity and will grow after partial hepatectomy

D The function of liver can be taken over by kidneys