

MATHEMATICS

1. The minimum value of $27 \tan^2 \theta + 3 \cot^2 \theta$ is

- a) 15 **b) 18** c) 24 d) 30

2. If $\sin \theta + \cos \theta = p$ and $\sin^3 \theta + \cos^3 \theta = q$ then $p(p^2 - 3)$ is equal to

- a) q b) $2q$ c) $-q$ **d) $-2q$**

3. In a family with 4 children the probability that there are at least two girls, is

- a) $\frac{1}{2}$ b) $\frac{9}{16}$ c) $\frac{3}{4}$ **d) $\frac{11}{16}$**

4. The point p is equidistant from $A(1,3)$, $B(-3,5)$ and $C(5,-1)$. Then $PA =$

- a) 5 b) $5\sqrt{5}$ c) 25 **d) $5\sqrt{10}$**

5. Mean of 100 items is 49. It was discovered that three items which should have been 60, 70, 80 were wrongly read as 40, 20, 50 respectively. The correct mean is

- a) 48 b) $82\frac{1}{2}$ **c) 50** d) 80

PHYSICS:

1. A particle moves with constant acceleration. If V_1, V_2 and V_3 are the average velocities in the three successive intervals t_1, t_2 and t_3 of time, then the correct relation is

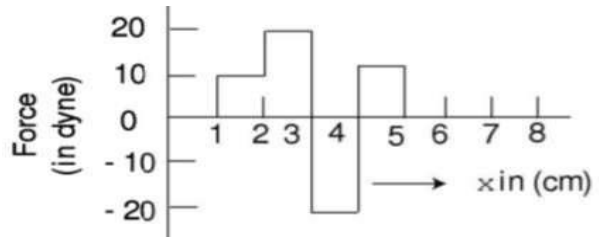
$$a) \frac{V_1 V_2}{V_2 V_3} = \frac{t_1}{t_2 t_3}$$

$$b) \frac{V_1 V_2}{V_2 V_3} = \frac{t_1 t_2}{t_1 t_3}$$

$$c) \frac{V_1 V_2}{V_2 V_3} = \frac{t_1}{t_2 t_3}$$

$$d) \frac{V_1 V_2}{V_2 V_3} = \frac{t_1}{t_2 t_3}$$

2. The graph between force and position as shown. The work done by the force in displacing the body from $x = 1\text{cm}$ to $x = 5\text{cm}$ is



- a) 20 erg b)) 60 erg
 c) 70 erg 4) 700 erg

3. Two bodies of masses 10 kg and 5 kg moving in concentric orbits of radii R and r such that their periods are the same. then the ratio of their centripetal acceleration is

a) $\frac{R}{r}$ b) $\left(\frac{R}{r}\right)^2$ 3) $\left(\frac{r}{R}\right)^2$ 4) $\frac{r}{R}$

4. A hollow cylinder 2.2×10^8 m of length 3m has inner and outer diameter as 2mm and 4mm respectively. The resistance of the cylinder is

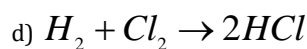
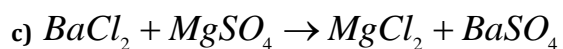
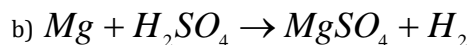
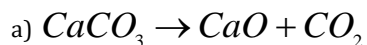
- a) $0.35 \times 10^{-3} \Omega$ b) $3 \times 10^{-3} \Omega$ **c) $7 \times 10^{-3} \Omega$** d) $3.1 \times 10^{-3} \Omega$

5. An object is placed at 20 cm from a convex mirror of focal length 20 cm. The distance of the image from the pole of the mirror is

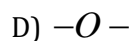
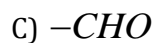
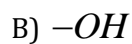
- a) Infinity **b) 10 cm** c) 15 cm d) 40 cm

CHEMISTRY

1. Which of the following reactions is an example of double decomposition?



2. List - I



List - II

(I) Ether

(II) Aldehyde

(III) Alcohol

(IV) Carboxylic acid

The correct match regarding the functional group is

A	B	C	D
a) I	III	IV	II
b) IV	III	II	I
c) IV	II	III	I
d) II	III	IV	I

3. PH of an aqueous solution is expressed as $-\log_{10}[H^+]$ and the p^{OH} as $\log_{10}[OH^-]$. the molar concentration (or) Molarity (M) of a solution is defined as the number of moles of solute dissolved in 1lt of solution. The pH of 0.05 M $Ba(OH)_2$ solution at $25^\circ C$ is.

a) 13

b) 1

c) 2

d) 7

4. Active metals liberate $H_2(g)$ by reacting with acids. In the reaction of 0.1M HCl, the following metal liberates H_2 gas at a faster rate

a) Al

b) Zn

c) Cu

d) Mg

5. The wavelength associated with yellow and red radiations are 5800Å and 7600Å respectively. The ratio of their wave speeds is

a) 58: 76

b) 76 : 58

c) 1 : 1

d) 152 : 5

BIOLOGY

1. About 50 percent of our body cells are of a single tissue, which is

- a) Muscle
- b) Nervous tissue
- c) Blood**
- d) connective tissue

2. Aerobic Respiration occurs in four steps

- a. Glycolysis
- b. Oxidative decarboxylation
- c. Krebs cycle
- d. Electron transport

From the above four stages in which stages carbon dioxide is released

- a) b&c**
- b) a&d
- c) c&d
- d) b&d

3. Sleeping in a parked a/c car is life threatening but not in the a/c room for a long period, what would be the reason?

- a) Car idling causes vibrations in the brain which is not safe.
- b) Irregular posture of sleep in the car stops the blood flow to the brain.
- c) Body temperature decreases drastically because of a closed compact car.
- d) Same air is recycled within the car causing CO poisoning**

4. Most of the photosynthetic autotrophic prokaryotic organisms do not produce following component during their photosynthesis

a) Glucose b) ATP c) **O₂** d) all of these

5. Which of the following events related to sexual reproduction of flowering plants after fertilisation?

i. Pollen formation

ii. Fusion of gametes

iii. Endosperm formation

iv. Pollen germination

v. Embryo Development

a) i, ii, iv **b) iii, v** c) i, ii, iii d) iii, iv

KEY:

MATHEMATICS:

1. b	2. <u>d</u>	3. <u>d</u>	4. <u>d</u>	5. <u>c</u>
-------------	--------------------	--------------------	--------------------	--------------------

PHYSICS:

6. d	7. <u>a</u>	8. <u>a</u>	9. <u>c</u>	10. <u>b</u>
-------------	--------------------	--------------------	--------------------	---------------------

CHEMISTRY

1. c	2. <u>b</u>	3. <u>a</u>	4. <u>d</u>	5. <u>c</u>
-------------	--------------------	--------------------	--------------------	--------------------

BIOLOGY

1. c	2. <u>a</u>	3. <u>d</u>	4. <u>c</u>	5. <u>b</u>
-------------	--------------------	--------------------	--------------------	--------------------