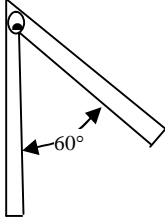


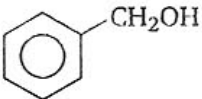
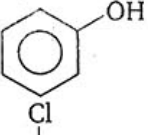
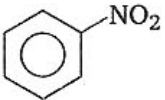

Sample Paper (For XIIth Medical Entrance)

Physics :

- The wooden block is dropped from the top of a cliff 100m high and simultaneously a bullet of mass 10 gm is fired from the cliff upwards with a velocity of 100 m/s. The bullet and wooden block will meet each other after a time:
(a) 10s (b) 0.5s (c) 1 s (d) 7 s
 - A 150 gm cricket ball, moving horizontally at 20 m/sec, was hit straight back to the bowler at 12 m/sec. If contact with the bat lasted for 1/25 sec, the average force exerted by the bat on the ball is
(a) 100 N (b) 120 N (c) 150 N (d) 200 N
 - A metre stick, of mass 600 gm, is pivoted at one end and displaced through an angle of 60°. The increase in its potential energy is ($g = 10 \text{ ms}^{-2}$)
(a) 1.5 J
(b) 15J
(c) 150J
(d) 0.15J
- 
- The diagram shows a vertical rod pivoted at the top. A second rod is attached to the same pivot point and is displaced from the vertical position by an angle of 60 degrees. An arrow indicates the angle between the vertical rod and the displaced rod.
- For the same total mass which of the following will have the largest moment of inertia about an axis passing the centre of gravity and perpendicular to the plane of the body?
(a) a disc of radius a (b) a ring of radius a
(c) a square lamina of side 2a (d) four rods forming a square of side 2a
 - A satellite is launched into a circular orbit of radius R around the earth. A second satellite is launched into an orbit of radius (1.01R). The period of the second satellite is larger than the first only by approximately.
(a) 0.9% (b) 1% (c) 1.5% (d) 3%
 - In a capillary tube experiment, a vertical 30 cm long capillary tube is dipped in water. The water rises up to a height of 10 cm due to capillary action. If this experiment is conducted in a freely falling elevator, the length of the water column becomes:
(a) 10 cm (b) 20 cm (c) 30 cm (d) None
 - A motor car blowing a horn of frequency 124 *vibration/sec* moves with a velocity 72 *km/hr* towards a tall wall. The frequency of the reflected sound heard by the driver will be (velocity of sound in air is 330 *m/s*)
(a) 109 *vibration/sec* (b) 132 *vibration/sec* (c) 140 *vibration/sec* (d) 248 *vibration/sec*

Chemistry :

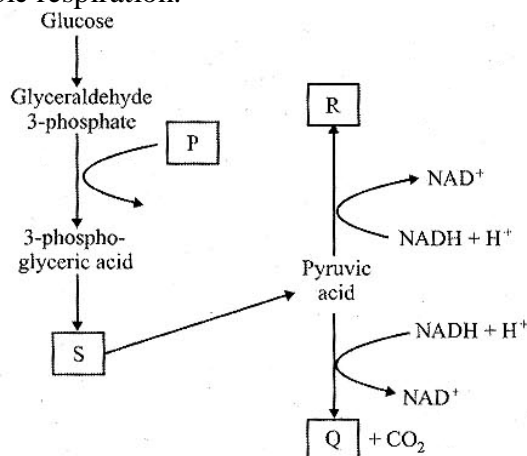
- Based on equation $E = -2.178 \times 10^{-18} \text{ J} \left(\frac{Z^2}{n^2} \right)$, certain conclusions are written. Which of them is not correct?
(a) Larger the value of n, the larger is the orbit radius
(b) Equation can be used to calculate the change in energy when the electron changes orbit
(c) For $n = 1$, the electron has a more negative energy than it does for $n = 6$ which means that the electron is more loosely bound in the smallest allowed orbit
(d) The negative sign in equation simply means that the energy of electron bound to the nucleus is lower than it would be if the electrons were at the infinite distance from the nucleus.
- Which of the following lanthanoid ions is diamagnetic?
(At. nos.: Ce = 58, Sm = 62, Eu = 63, Yb = 70)
(a) Sm^{2+} (b) Eu^{2+} (c) Ce^{2+} (d) Yb^{2+}

3. Some of the properties of the two species, NO_3^- and H_3O^+ are described below. Which one of them is correct?
- Dissimilar in hybridization for the central atom with different structure
 - Isostructural with same hybridization for the central atom
 - Isostructural with different hybridization for the central atom
 - Similar is hybridization for the central atom with different structure
4. A reaction occurs spontaneously if:
- $T\Delta S = \Delta H$ and both ΔH and ΔS are positive
 - $T\Delta S > \Delta H$ and both ΔH and ΔS are positive
 - $T\Delta S > \Delta H$ and both ΔH and ΔS are positive
 - $T\Delta S > \Delta H$ and ΔH is positive and ΔS is negative
5. Solubility of the alkaline earth's metal sulphates in water decreases in the sequence:-
- $\text{Ca} > \text{Sr} > \text{Ba} > \text{Mg}$
 - $\text{Sr} > \text{Ca} > \text{Mg} > \text{Ba}$
 - $\text{Ba} > \text{Mg} > \text{Sr} > \text{Ca}$
 - $\text{Mg} > \text{Ca} > \text{Sr} > \text{Ba}$
6. Which one of the following is most reactive towards electrophilic attack?
- 
 - 
 - 
 - 
7. Which of the following reagents will be able to distinguish between 1-butyne and 2-butyne?
- NaNH_2
 - HCl
 - O_2
 - Br_2

Biology :

1. Which of the following statements are correct ?
- In prokaryotic cells, a special membranous structure formed by the extension of the plasma membrane into the cell is known as polysome.
 - The smooth endoplasmic reticulum is the major site for synthesis of glycoproteins.
 - RuBisCO is the most abundant protein in the whole biosphere.
 - Mitochondria, chloroplasts and peroxisomes are not considered as part of endomembrane system.
- Of the above statements
- (iii) and (iv)
 - (i) and (ii)
 - (ii) and (iii)
 - (i) and (iv)
2. Why the velocity of enzymatic reaction is not exceeded by any further rise in the concentration of the substrate?
- The enzyme molecules are equal to the substrate molecules.
 - The enzyme molecules are fewer than the substrate molecules.
 - The substrate molecules are not closely resembled to the enzyme molecules.
 - Both b and c.
3. Which of the following statements is/are not incorrect ?
- Water and minerals, and food are generally moved by a mass or bulk flow system.
 - Bulk flow can be achieved either through a positive hydrostatic pressure gradient or a negative hydrostatic pressure gradient.
 - The bulk movement of substances through the conducting tissues of plants is called translocation.
 - Xylem translocates organic and inorganic solutes, mainly from roots to the aerial parts of the plants.
 - Phloem translocates water, mineral salts, some organic nitrogen and hormones, from the leaves to other parts of the plants.
- (ii), (iii) and (v)
 - (ii), (iii) and (iv)
 - (iv) and (v)
 - (ii) and (v)

4. Which one of the following statement correctly describes the cyclic photophosphorylation ?
- Cyclic photophosphorylation has both PS-I and PS-II.
 - Cyclic photophosphorylation produces neither ATP no $\text{NADPH} + \text{H}^+$.
 - Water is the ultimate source of e^- in cyclic photophosphorylation.
 - Electrons are cycled in cyclic photophosphorylation.
5. The given figure shows the few step of the pathway are indicated by P, Q, R and S major pathway of anaerobic respiration.



Identify P, Q, R and S

	P	Q	R	S
(a)	NAD^+	Ethanol	Lactic acid	PEP
(b)	Ethanol	NAD^+	Lactic acid	ATP
(c)	Lactic acid	Ethanol	Glucose	ADP
(d)	NAD	Lactic acid	Ethanol	DHAP

6. The essential distinction between long-day and short-day plants is that flowering long day plants is promoted only when the day length exceeds a certain duration, called the _____.
- critical day length
 - short-long day length
 - long-short day length
 - photoperiod
7. Which of the following statements are true/false ?
- The blood transports CO_2 comparatively easily because of its higher solubility.
 - Approximately 8 – 9% of CO_2 is transported being dissolved in the plasma of blood.
 - The carbon dioxide produced by the tissues, diffuses passively into the blood stream and passes into red blood corpuscles and react with water to form H_2CO_2
 - The oxyhaemoglobin (HbO_2) of the erythrocytes is basic.
 - The chloride ions diffuse from plasma into the erythrocytes to maintain ionic balance.
- (i), (iii) and (v) are true ; (ii) and (iv) are false
 - (i), (iii) and (v) are false ; (ii) and (iv) are true
 - (i), (ii) and (iv) are true ; (iii) and (v) are false
 - (i), (ii) and (iv) are false ; (iii) and (v) are true
8. If Henle's loop were absent from mammalian nephron which of the following event is to expected ?
- There will be no urine formation.
 - There will be hardly any change in the quality and quantity of urine formed.
 - The urine will be more concentrated.
 - The urine will be more dilute.

Answers Key

Physics

1	2	3	4	5	6	7
(c)	(b)	(b)	(b)	(c)	(c)	(c)

Chemistry

1	2	3	4	5	6	7
(c)	(d)	(a)	(b)	(d)	(b)	(a)

Biology

1	2	3	4	5	6	7	8
(a)	(a)	(c)	(d)	(a)	(a)	(a)	(d)