

- Which of the following would be found within a prokaryotic cell?  
 (A) Mitochondria (B) Nucleus  
 (C) Rough endoplasmic reticulum (D) Ribosomes
  - How is the lion's name correctly written following the binomial nomenclature?  
 (A) Panthera leo (B) PANTHERA LEO  
 (C) *Panthera leo* (D) Panthera leo
  - Eggs contain polymer molecules named 'Albumin'. What is the constituent molecule of this polymer?  
 (A) Glucose (B) Ribose (C) Amino acids (D) Nucleotides.
  - What is the possible combination of nitrogenous bases common to both DNA and RNA?  
 (A) Adenine, Guanine and Cytosine  
 (B) Cytosine, Guanine and Uracil  
 (C) Cytosine, Thymine and Adenine  
 (D) Uracil, Adenine and Guanine
  - In which of the following epithelial tissue and its location in human body is matched correctly?  

<b>tissue type</b>	<b>location</b>
(A) Simple squamous epithelium -	lining of trachea
(B) Pseudostratified epithelium -	wall of blood capillary
(C) Simple columnar epithelium -	inner wall of Bowman's capsule
(D) Simple cuboidal epithelium -	wall of proximal convoluted tubule
  - Which one among the following is known as 'animal starch'?  
 (A) Cellulose (B) Glycogen (C) Pectin (D) Chitin
  - Which of the following combination represent the endemic, indigenous and exotic species to Sri Lanka?  
 (A) Rubber, Garcinia, Snakehead fish  
 (B) Black ruby barb, Rubber, Kitul  
 (C) Snakehead fish, Garcinia, tilapia  
 (D) Hora, Snakehead fish, tilapia
  - Following are some methods used in sterilization and controlling microbes.  
 a. Moist heat      b. Pasteurization      c. Dry heat      d. Filtration
- Which response depicts the methods used to sterilize and control microorganisms in petridishes, water, culture media and milk respectively?
- (A) a, b, c, d      (B) c, b, d, a      (C) c, d, b, a      (D) c, d, a, b
- Which of the following compound is mainly found in kidney stones?  
 (A) Sodium chloride (B) Sodium silicates  
 (C) Calcium bicarbonate (D) Calcium oxalate
  - What is the function of Trypsin enzyme?  
 (A) Breaking down fats (B) Breaking down proteins  
 (C) Breaking down cellulose (D) Breaking down carbohydrates

11. Which one of the following animal phylum - feature combination is matched incorrectly?

phylum		feature
(A) Platyhelminthes	-	flame cells
(B) Chordata	-	ventral heart
(C) Annelida	-	open circulatory system
(D) Mollusca	-	muscular foot

12. 'Simple goiter' is an illness caused by the nutritional deficiency of a particular element. What is this element?

- (A) Iodine                      (B) Calcium                      (C) Magnesium                      (D) Iron

13. The children of a colour-blind mother and a normal father would be;

- (A) Normal daughters and sons                      (B) Normal sons and carrier daughters  
(C) Colour blind sons and carrier daughters                      (D) Colour blind sons and daughters

14. Following are some biochemical processes important to proceed natural nitrogen cycle.

- a. Nitrogen fixation    b. Nitrification                      c. Denitrification

In which of the following responses, the microbes involve in above a, b, c, processes are mentioned in correct order?

- (A) *Nitrosomonas*, *Clostridium*, *Azotobacter*  
(B) *Anabaena*, *Nitrobacter*, *Pseudomonas*,  
(C) *Clostridium*, *Thiobacillus*, *Nitrosomonas*  
(D) *Nitrobacter*, *Thiobacillus*, *Pseudomonas*

15. Following combinations show the different forms of acquired immunity related to human body.

- a. Naturally acquired active immunity - infant gets from mother's breast milk.  
b. Naturally acquired passive immunity - by having chicken pox once.  
c. Artificially acquired active immunity – by Polio vaccine  
d. Artificially acquired passive immunity – by tetanus toxoid vaccine

In which combination the type of acquired immunity and the relevant example is correctly matched?

- (A) a and b                      (B) b and c                      (C) c and d                      (D) a and c

16. Which statement about the species,  $O^{2-}$ ,  $F^-$ , Ne,  $Na^+$  and  $Mg^{2+}$  is true ? They all,

- (A) Contain more electrons than protons.  
(B) Contain more neutrons than protons.  
(C) Contain the same number of electrons.  
(D) Contain the same number of neutrons.

17. Potassium, K, is an element in Group I of the Periodic Table. Which of the following statements about potassium are true?

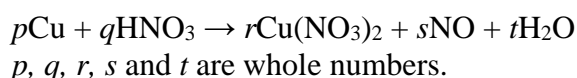
1. Potassium conducts electricity both when solid and when molten.  
2. Potassium reacts explosively with water.  
3. Potassium reacts with water and forms a solution of  $pH < 7$ .

- (A) 1 and 2 only                      (B) 1 and 3 only                      (C) 2 and 3 only                      (D) 1, 2 and 3

18. Which gas contains the same number of molecules as 9 g of water?  
 (A) 4 g of hydrogen (B) 28 g of nitrogen  
 (C) 16 g of oxygen (D) 44 g of carbon dioxide

19. A covalent bond is formed by,  
 (A) Electron sharing between metals and non-metals.  
 (B) Electron sharing between non-metals.  
 (C) Electron transfer between non-metals.  
 (D) Electron transfer from metals to non-metals.

20. The equation for the reaction between copper and nitric acid is shown below.



Which values of  $p$ ,  $q$ ,  $r$ ,  $s$  and  $t$  balance the equation?

	$p$	$q$	$r$	$s$	$t$
(A)	1	2	1	1	1
(B)	1	4	1	2	2
(C)	3	4	3	2	2
(D)	3	8	3	2	4

21. Copper (II) sulfate crystals are separated from sand using the four processes listed below.  
 In which order are these processes used?

(A)	filtering	dissolving	crystallising	evaporating
(B)	filtering	dissolving	evaporating	crystallising
(C)	dissolving	evaporating	filtering	crystallising
(D)	dissolving	filtering	evaporating	crystallising

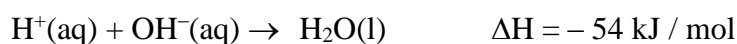
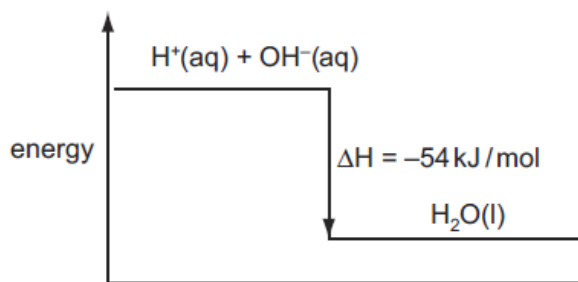
22. A student mixed aqueous solutions of P and Q together. A white precipitate formed.  
 Which could not be the solutions P and Q?

	Solution P	Solution Q
(A)	Hydrochloric acid	Silver nitrate
(B)	Hydrochloric acid	Sodium nitrate
(C)	Sodium chloride	Lead (II) nitrate
(D)	Sodium chloride	Silver nitrate

23. Which reaction does not involve either oxidation or reduction?

- (A)  $\text{CH}_4(\text{g}) + 2\text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{g})$   
 (B)  $\text{Cu}^{2+}(\text{aq}) + \text{Zn}(\text{s}) \rightarrow \text{Cu}(\text{s}) + \text{Zn}^{2+}(\text{aq})$   
 (C)  $\text{CuO}(\text{s}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{CuSO}_4(\text{aq}) + \text{H}_2\text{O}(\text{l})$   
 (D)  $\text{Zn}(\text{s}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{ZnSO}_4(\text{aq}) + \text{H}_2(\text{g})$

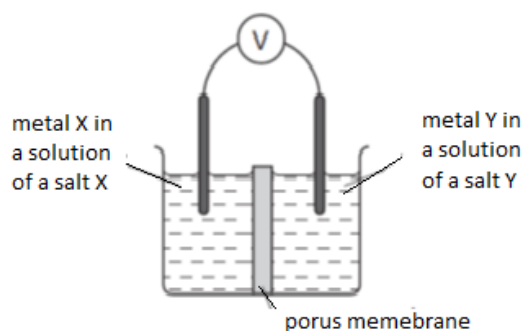
24. The energy diagram for the reaction between sodium hydroxide and hydrochloric acid is shown below.



Which quantity of heat is released when 100 ml of 1 mol / dm<sup>3</sup> hydrochloric acid reacts with 100 ml of 1 mol / dm<sup>3</sup> sodium hydroxide?

- (A) 0.54 kJ      (B) 2.70 kJ      (C) 5.40 kJ      (D) 10.8 kJ

25. Which pair of metals X and Y will produce the highest voltage when used as electrodes in a simple cell?



- | Metal X       | Metal Y |
|---------------|---------|
| (A) Copper    | Silver  |
| (B) Magnesium | Silver  |
| (C) Magnesium | Zinc    |
| (D) Zinc      | Copper  |

26. The following changes could be made to the conditions in the reaction between zinc and hydrochloric acid.

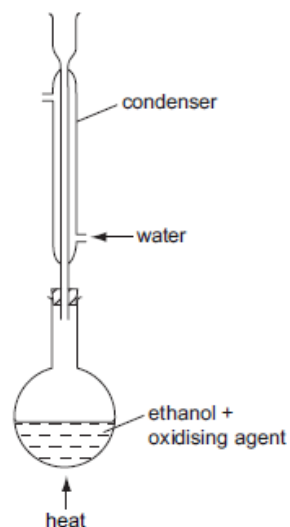
1. Increase in concentration of the acid
2. Increase in particle size of the zinc
3. Increase in pressure on the system
4. Increase in temperature of the system

Which pair of changes will increase the rate of reaction?

- (A) 1 and 2      (B) 1 and 4      (C) 2 and 3      (D) 3 and 4

27. 15.0 ml of 1.0 mol / dm<sup>3</sup> potassium hydroxide just neutralise 20.0 ml of a solution of hydrochloric acid. What is the concentration of the acid?
- (A) 0.75 mol / dm<sup>3</sup>      (B) 1.0 mol / dm<sup>3</sup>      (C) 1.5 mol / dm<sup>3</sup>      (D) 7.5 mol / dm<sup>3</sup>
28. If the pressure on 45 ml of gas is changed from 6 atm to 8 atm, the new volume will be,
- (A) 60 ml      (B) 33.75 ml      (C) 0.045 ml      (D) 22.4 ml
29. The labels fell off from two bottles each containing a colorless solution. One of which was sodium carbonate solution while the other was sodium chloride solution. The addition of which solution to a sample from each bottle would most readily enable the bottles to be correctly relabeled?
- (A) Ammonia      (B) Hydrochloric acid  
(C) Lead(II) nitrate      (D) Sodium hydroxide
30. A constant force is applied to a body moving along a frictionless surface. Which one of the following physical quantities will not change while the force acts on the body?
- (A) Velocity      (B) Momentum      (C) Kinetic energy      (D) Acceleration
31. If a virtual image is formed 10.0 cm from a convex mirror with focal length 15.0 cm, what is the object distance from the mirror?
- (A) 30 cm      (B) 10 cm      (C) 6 cm      (D) 9 cm
32. If the Energy required to accelerate an object from 0 to 10 m.s<sup>-1</sup> is E, what is the energy required to accelerate the same object from 10 m.s<sup>-1</sup> to 20 m.s<sup>-1</sup>?
- (A) 2E      (B) 4E      (C) 3E      (D) E
33. 2 kg of water (specific heat capacity = 4200 J.K<sup>-1</sup>. Kg<sup>-1</sup>) is heated so that its temperature rises by 10 °C. How much energy is transferred to the water?
- (A) 84000 J      (B) 8400 J      (C) 4200 J      (D) 42000J
34. The oxidation of ethanol to acetic acid is often carried out in the apparatus shown below. What is the purpose of the condenser?

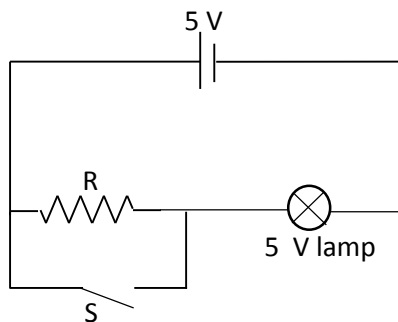
- (A) To prevent air reacting with the acetic acid  
(B) To prevent any ethanol from escaping  
(C) To prevent the acetic acid changing back to ethanol  
(D) To prevent the acetic acid reacting with the ethanol



35. Equal masses of water of density  $1 \text{ g.cm}^{-3}$  and a liquid of density  $2 \text{ g.cm}^{-3}$  are mixed together, then the mixture has a density of

- (A)  $\frac{2}{3} \text{ g.cm}^{-3}$       (B)  $\frac{4}{3} \text{ g.cm}^{-3}$       (C)  $\frac{3}{2} \text{ g.cm}^{-3}$       (D)  $3 \text{ g.cm}^{-3}$

36. When the circuit shown is connected with S switch is open, 5 V lamp glows.

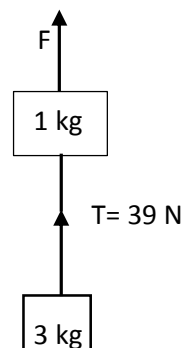


What happens to the lamp when switch S is closed?

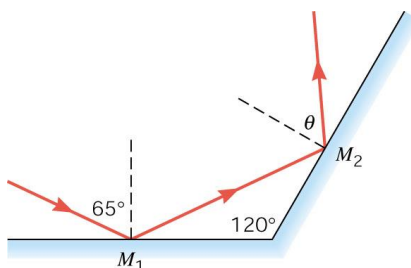
- (A) Lamp becomes brighter      (B) Nothing will happen  
 (C) Lamp becomes dimmer      (D) Lamp goes off.

37. Two masses, 1 kg and 3 kg are moving upward under the gravity. If the tension T in the connecting string between masses is 39 N, what is the acceleration of the masses. ( $g = 10 \text{ m.s}^{-2}$ )

- (A)  $2 \text{ m.s}^{-2}$       (B)  $3 \text{ m.s}^{-2}$       (C)  $4 \text{ m.s}^{-2}$       (D)  $5 \text{ m.s}^{-2}$



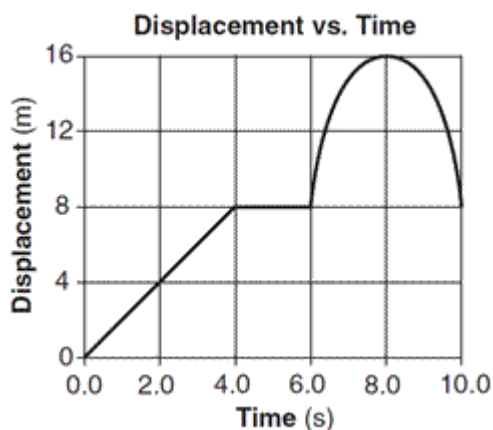
38. Two plane mirrors are kept as shown below.



If a ray strikes mirror  $M_1$  at a  $65^\circ$  angle of incidence, at what angle ( $\theta$ ) does it leave mirror  $M_2$ ?

- (A)  $25^\circ$       (B)  $35^\circ$       (C)  $45^\circ$       (D)  $55^\circ$

39. The graph below represents the displacement of an object moving in a straight line as a function of time.

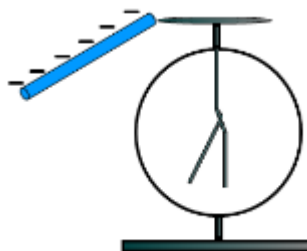


What was the total distance traveled by the object during the 10-second time interval?

- (A) 20 m                      (B) 30 m                      (C) 24 cm                      (D) 16 m

40. A neutral electroscope is touched with a negatively charged rod. The charge on the electroscope after the rod is removed will be;

- (A) Positive  
 (B) Negative  
 (C) Neutral  
 (D) Its charge depends on the contact time



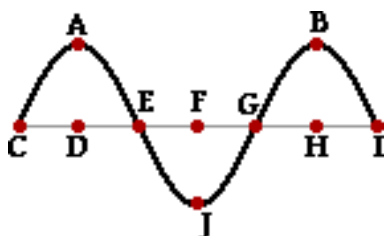
41. If  $2^{2x+2} = 2^{3x-1} \times 4$ , then x is

- (A) 3                      (B) -3                      (C) 1                      (D) 2

42. If  $v^2 = u^2 + 2as$ , then u is

- (A)  $(v^2 - 2as)^{-\frac{1}{2}}$                       (B)  $(v^2 - 2as)^{\frac{1}{2}}$                       (C)  $(v^2 - 2as)^2$                       (D)  $(v^2 - 2as)^{-1}$

43. A transverse wave is traveling through a medium.



The particles of the medium;

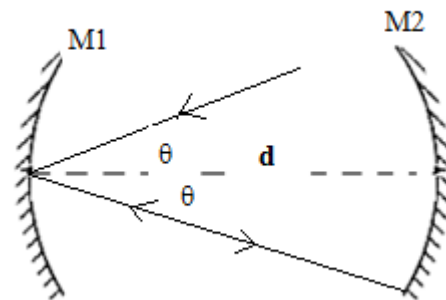
- (A) Vibrate parallel to the line joining CI.                      (B) Move along the line joining CI.  
 (C) Vibrate perpendicular to the line joining CI.                      (D) Move along the curve CAEJGBI.

44. A cylindrical vessel contains a volume of  $V$  of a liquid with density  $\rho$ . Which combination will produce the same pressure at the bottom of the vessel?

	Cross-sectional area of the vessel	Density of the liquid	Volume of the liquid
(A)	$\frac{A}{2}$	$2\rho$	$V$
(B)	$\frac{A}{2}$	$\frac{\rho}{2}$	$2V$
(C)	$2A$	$2\rho$	$V$
(D)	$2A$	$\frac{\rho}{2}$	$2V$

45. Two concave mirrors are placed on same principal axis. A light ray reflects between mirrors as shown in the figure. Find focal length of mirror M2 in terms of the separation  $d$  of the mirrors.

- (A)  $d$                                       (B)  $2d$   
 (C)  $\frac{d}{2}$                                       (D)  $\frac{d}{3}$



46. Find the equation of the line parallel to the line whose equation is  $y = 6x + 2$  and whose y-intercept is 8

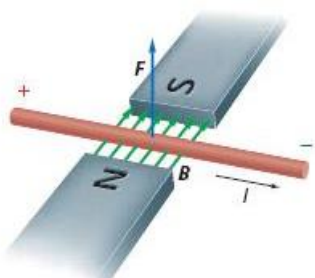
- (A)  $y = -6x + 8$                       (B)  $y = (-1/6)x + 8$       (C)  $y = (1/6)x + 8$       (D)  $y = 6x + 8$

47. Suppose you are sitting next to a fireplace in which there is a fire burning. One end of a metal rod has been left in the fire. Which one of the following statements concerning this situation is true?

- (A) You can feel the heat of the fire primarily because of convection.  
 (B) The end of the metal rod that is not in the fire is warmed through conduction.  
 (C) Heat escapes from the fire only through conduction.  
 (D) You can feel the heat of the fire primarily because of conduction.



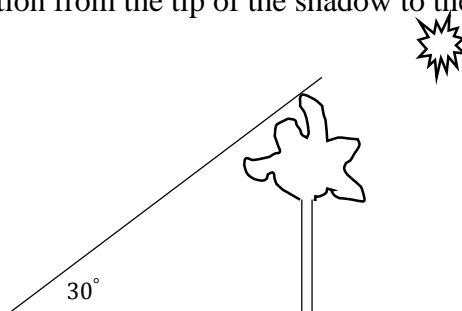
48. Which one of the following statements concerning the direction of the magnetic force (F) shown in the following is true?



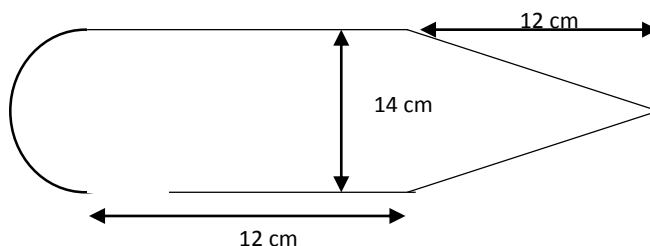
- (A) The direction of the force cannot be changed by changing the direction of current
- (B) The direction of the force cannot be changed by interchanging the magnetic poles
- (C) The direction of the force can be changed by changing the direction of current and interchanging the magnetic poles simultaneously.
- (D) The direction of the force can be changed by either changing the direction of current or interchanging the magnetic poles

49. A tree casts a shadow that is 50 m long. If the angle of elevation from the tip of the shadow to the top of the tree is  $30^\circ$ , how tall is the tree?

- (A)  $50 \sin 30^\circ$
- (B)  $50 \cos 60^\circ$
- (C)  $50 \tan 30^\circ$
- (D)  $50 \cos 30^\circ$



50. The figure below consists of a semicircle, quadrangle and triangle.



What is the area of this figure? ( $\pi = \frac{22}{7}$ )

- (A)  $300 \text{ cm}^2$
- (B)  $329 \text{ cm}^2$
- (C)  $229 \text{ cm}^2$
- (D)  $269 \text{ cm}^2$

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