Sample Question Paper (TERM - I)

Solutions

Section - A

Ans. 1	(c) Remove the layer of magnesium carbonate from the ribbon surface. **Explanation:** Before burning in air, the magnesium ribbon is cleaned by rubbing with sandpaper. This is done to remove the protective layer of basic magnesium carbonate ($Mg(CO_3)_2$) from the surface of ribbon.
Ans. 2	(a) **18** **Explanation:** In the neutral atom of an element, no. of protons = no. of electrons ∴no. of electrons in element A= 19 Now, in A+ ion, the positive charge is acquired by the loss of one electron. ∴ no. of electrons in ion A+ = 19-1=18
Ans. 3	(b) Citric acid **Explanation:** Citric acid is one of the forms of acid. It is a weak organic acid. Fruits which are citruses like lemon, oranges, and mango contain citric acid in them.
Ans. 4	(a) Exothermic process **Explanation:** The respiration process during which glucose undergoes slow combustion by combining with oxygen in the cells of our body to produce energy, is a kind of Exothermic process (respiration is considered an exothermic process.)
Ans. 5	(a) The litmus paper used is dry **Explanation:** In case of dry HCl gas, there is no presence of water and so, the dye on litmus paper cannot react with the gas. So, any dry gas will not give any change in the colour of litmus paper.
Ans. 6	(d) Changing of the atoms of on element into those of another element to form new products **Explanation:** A chemical reaction, one substance is converted into another by rearrangement of atoms and not by changing elements of one type into another.

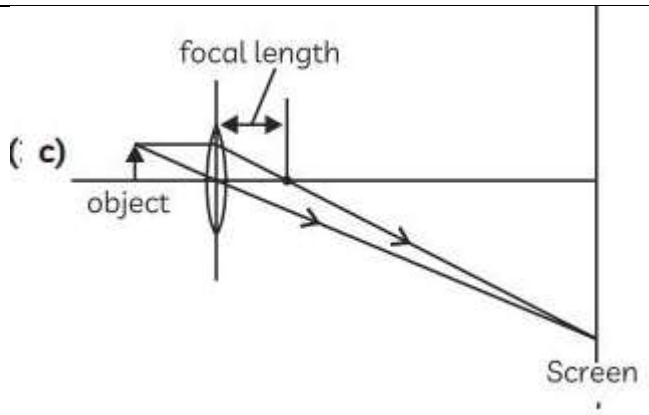
Ans. 7	(b) (i) and (iii) **Explanation:** On adding the acid into the water, acid gets ionized and breaks down into ions, with that there is also seen dilution of acid as water soluble acids gets hydrogen bonding and gets diluted.
Ans. 8	(d) (ii) and (iv) **Explanation:** Litmus and methyl orange turn red in acidic solution.
Ans. 9	(d) (iii) and (iv) **Explanation:** Rancidity is development of unpleasant smell from food due to oxidation or hydration of fat by metallic atoms and microbes. It is prevented by adding antioxidants to the food, storing the food in air-tight compartment, storing the food in refrigerator and keeping the food away from the sun.
Ans. 10	(a) Mg > Al > Zn > Fe **Explanation:** The decreasing order of the reactivity of the common metals is given below: Li, K, Na, Ba, Ca, Mg , Al, Mn, Zn, Fe, Ni, Sn, Pb, [H], Cu,Hg, Ag, Au,Pt
Ans. 11	(B) **Explanation:** In parasitic nutrition organism derives its food from the body of another living organism called host without killing it. Parasitic mode of nutrition is observed in several fungi, bacteria, few plants like Cuscuta and some animals like Plasmodium and round worms.
Ans. 12	(C) **Explanation:** Peristalsis is a type of wave-like movement occurring in the alimentary canal which involves contraction and relaxation of the muscles. It begins in the esophagus and helps to move the food along the alimentary canal for the process of digestion.
Ans. 13	(B) **Explanation:** The breakdown of pyruvate to give carbon dioxide, water and energy takes place in mitochondria.
Ans. 14	(C) **Explanation:** Haemoglobin is the respiratory pigment in human beings.
Ans. 15	(B)

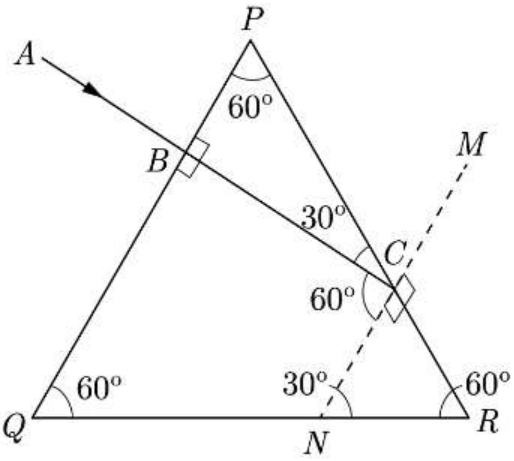
	Explanation: Gas exchange takes place in the millions of alveoli in the lungs and the capillaries that envelop them.
Ans. 16	(B) **Explanation:** Salivary amylase helps in breaking of starch into simple carbohydrates
Ans. 17	**(a)** 2.0 D and +50 cm respectively **Explanation:** The power of combination of lenses is given by: $P = P_1 + P_2$ Therefore, $P = +2.5 - 0.5 = +2.0$ D Focal length is the reciprocal of power. Therefore, $f = 1/2$ m $= +0.5$ m $= +50$ cm
Ans. 18	**(b)** 20 cm **Explanation:** The rays coming from an object placed at large distance can be considered as a parallel rays. After reflection from it, they appear to meet at its focus, which is $\frac{40}{2} = 20$ cm.
Ans. 19	(d) the image becomes less brighter than before. **Explanation:** A complete image of an object will be formed but of less intensity because the light falling on the covered portion will not reach at the image position.
Ans. 20	**(c)** 4 mm **Explanation:** Given $f = +10$ cm (Convex lens) $h_1 = 2$ mm $= 0.2$ cm $u = -5$ cm $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ $\frac{1}{f} = \frac{1}{v} - (-\frac{1}{5}) \Rightarrow \frac{1}{f} = \frac{1}{v} + \frac{1}{5}$ $\frac{1}{v} = \frac{1}{10} - \frac{1}{5}$ $= \frac{1-2}{10} = \frac{-1}{10}$ $v = -10$ cm $\Rightarrow m = \frac{v}{u} = \frac{h_2}{h_1}$

	$m = \frac{-10}{-5} = \frac{h_2}{0.2}$ $h_2 = 0.4$ cm $h_2 = 4$ mm
Ans. 21	**(d)** $-\frac{80}{3}$ cm **Explanation:** $m = -3$ $v = 80$ cm $m = \frac{v}{u}$ $-3 = \frac{80}{u}$ $u = \frac{80}{-3}$ $= \frac{-80}{3}$ cm
Ans. 22	**(c)** (II), (lII) and (IV) **explanation:** A concave mirror forms a real and inverted image of an object for all positions of the object except when object lies between the pole and focus of the mirror, in which virtual and erect image is formed behind the mirror. The ray of light shown is incident normally on the mirror and hence will be reflected back along the same path.
Ans. 23	**(d)** Medium 1 and 3 are essentially the same medium, but medium 2 is denser than 1 and 3. **Explanation:** It is given that $\angle 1 = \angle 3 = \angle 4$ but $\angle 2 < \angle 1$. This means that medium 1 and 3 are the same medium as angle of emergence ($\angle 3$) is equal to the angle of incidence ($\angle 1$) only when both media are same. Medium 2 is denser than both medium 1 and 3 as angle of refraction ($\angle 2$) is less than angle of incidence ($\angle 1$)
Ans. 24	**(b) 1.21** **Explanation:**

	Refractive index of flint glass w.r.t alcohol $= \frac{\text{RI of flint glass}}{\text{RI of alcohol}} = \frac{1.65}{1.36} = 1.21$ The refractive index of two media with respect, to each other can be found out in the following manner. Consider three transparent media 1. 2 and 3 having refractive indices n_1, n_2 and n_3 respectively. Then, the refractive index of medium 3 with respect to medium 2 is given as, $n_{32} = \frac{n_3}{n_2} = \frac{\frac{n_3}{n_1}}{\frac{n_2}{n_1}} = \frac{n_{31}}{n_{21}} = n_{31} \times n_{12}$
	Section - B
Ans. 25	(b)Nitrogen gas **Explanation:** gases such as helium or nitrogen prevent the contact of air (or atmospheric oxygen) with oil. In this way, we can prevent oil from becoming rancid for a long period of time.
Ans. 26	(d) $AgNO_3$ solution and copper metal **Explanation:** Copper (Cu) being more reactive than silver (Ag), displaces silver from silver nitrate ($AgNO_3$) to form copper nitrate $2AgNO_3 + Cu \rightarrow Cu(NO_3)_2 + 2Ag$
Ans. 27	(a) $CuSO_4 + Fe$ **Explanation:** As per the reactivity series of metals, iron is more reactive than copper metal so it can displace copper from copper sulphate solution and form iron (II) sulphate and copper:
Ans. 28	(b) Na **Explanation:** Na is a metal which is soft enough to be cut with a knife. It is so reactive that it reacts vigorously with air or moisture and catches fire when kept in open. So to prevent it from coming in contact with oxygen and moisture, it is kept in kerosene.
Ans. 29	(d) Calcium chloride, carbon dioxide and water **Explanation:** $CaCO_3(s)+2HCl(aq)\rightarrow CaCl_2(aq)+CO_2(g)+H_2O(l)$.
Ans. 30	(c) Baking soda

	Explanation: Methanoic acid is injected into the skin of a person during an ant's sting. The effect of methanoic acid can be neutralised by rubbing a mild base like baking soda solution on the stung area of the skin.
Ans. 31	(b) Both A and R are true but R is not the correct explanation of A.
Ans. 32	(a) Both A and R are true and R is the correct explanation of A
Ans. 33	(B) **Explanation:** Both A and R are true, but R is not the correct explanation of A Kidney failure can be managed by artificial kidney. It is a device used to remove nitrogenous waste products from the blood through dialysis. Artificial kidney is different from natural kidney as the process of reabsorption does not occur in artificial kidney.
Ans. 34	(d) White light is made up of seven constituent colours. **Explanation:** The splitting of white light into its constituent colours as it passes through a refracting medium (such as prism) is known as dispersion. The phenomenon of dispersion shows that white light is made up of seven constituent colours.
Ans. 35	(b) $CaSO_4 \cdot \frac{1}{2}H_2O$
Ans. 36	(C) Platelets are required for clotting of the blood. The platelets collect at a wound site in conjunction with other clotting factors, such as fibrinogen, to form a fibrin clot that prevents blood loss and allows the wound to heal.
Ans. 37	(B) **Explanation:** The stores form of energy in plants is starch
Ans. 38	(C) **Explanation:** Bladder holds urine until you're ready to empty it (pee). It's hollow, made of muscle, and shaped like a balloon. Your bladder expands as it fills up.

Ans. 39	 **Explanation:** In the image formation by a converging or convex lens, a ray parallel to the principal axis passes through the focus after refraction and a ray passing through the optical center does not suffer any deviation, as it incident normally.
Ans. 40	**(a)** 30 cm in front of the mirror **Explanation:** If rays converge at a point 15 cm from the mirror, then. So, $f = -15$ cm $C = -30$ cm An object kept at C makes an image of the same size as object.
Ans. 41	(B) Small Intestine
Ans. 42	(A) **Explanation:** Valves helps in preventing backflow of blood.
Ans. 43	**(C)** 2.25×10^8 m/sec
Ans. 44	**Explanation:** in case of convex lens, when the object is at placed at infinity, the image is formed at the focus of the lens. The nature of the image is real and inverted.
Ans. 45	(b) The blue colour of the sky is due to scattering of light. **Explanation:** When the Sun's light reaches the Earth's atmosphere it is scattered, or deflected, by the tiny molecules of gas (mostly nitrogen and oxygen) in the air. Because these molecules are much

	smaller than the wavelength of visible light, the amount of scattering depends on the wavelength. Shorter wavelengths (violet and blue) are scattered the most strongly, so more of the blue light is scattered towards our eyes than the other colours. You might wonder why the sky doesn't actually look purple since the violet light is scattered even more strongly than blue. This is because there isn't as much violet in sunlight to start with, and our eyes are much more sensitive to blue.
Ans. 46	(a) 60° **Explanation :** At face PQ, angle of incidence is 0° as ray AB falls normally on this face. This normally incident ray AB goes undeviated and strikes the face PR at point C. The angle of incidence, at point C with the normal MN is the angle NCB. From the geometry of figure, it is clear that ∠NCB is equal to 60°.  Therefore, angle of incidence at face PQ is 0° and angle of incidence at face PR is 60°
Ans. 47	(b) Twice **Explanation:** There are two refractions once when light goes from air to glass and second time when light goes from glass to air.
Ans. 48	(b) Blue to white **Explanation:** when blue copper sulphate crystals are heated they lose water of crystallization and blue colour of $cuso_4$ changes to white.

Section – C	
Ans. 49	(a) Copper **Explanation:** Copper is placed below hydrogen in activity series therefore, it is less reactive than hydrogen.
Ans. 50	(a) Iron **Explanation:** Iron is placed above hydrogen in activity series therefore, it is more reactive than hydrogen.
Ans. 51	(c) Sodium
Ans. 52	(a) Na > Mg > Al > Cu
Ans. 53	(C) **Explanation:** The storage organ for urine is urinary bladder. However urine is stored there for a certain time period i.e. temporary.
Ans. 54	(B) **Explanation:** The main function of ureter is that it carries urine from kidney to bladder which is the storage organ.
Ans.55	(D) **Explanation:** Structure 5(ureter) has high concentration of urea since it carries urine. Structure 3 (renal vein) has least amount of urea.
Ans.56	(D) **Explanation:** Kidney → ureter → urinary bladder → urethra
Ans.57	(b) a parallel-sided glass block **Explanation:** As both the rays 1 and 2 are parallel to each other but laterally displaced. So, the material X is a glass slab. The emergent ray is always parallel to the incident ray in case of a glass slab, but is laterally displaced.
Ans.58	(c) 30° **Explanation:** Refractive index of medium $= \frac{\sin i}{\sin r}$ $1.5 = \frac{\sin 48.6^\circ}{\sin r}$

	$1.5 = \frac{0.75}{\sin r}$ $\sin r = \frac{0.75}{1.5}$ $\sin r = 0.5$ $r = \sin^{-1}(0.5)$ $r = 30^{\circ}$
Ans.59	**(d)** (III) and (V) are correct. **Explanation:** As light bends towards the normal when it travels from air to glass, as air is rarer than glass, which means that the refractive index of air is less than that of glass. The refractive index of a medium 2 with respect to medium 1 or n_{21} is the ratio of sine of angle of incidence i to the sine of angle of refraction r which can be written as $\mathbf{\frac{\sin i}{\sin r} = n_{21}}$
Ans.60	**(a)** lateral shift of the rays would have been less. **Explanation:** The lateral shift depends on the refractive index of the medium and thickness of the slab. The greater the refractive index of the second medium, greater would light bend and hence greater would be the lateral shift.