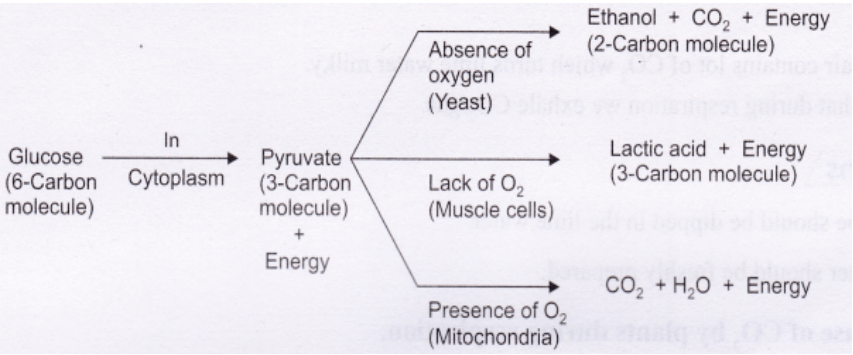
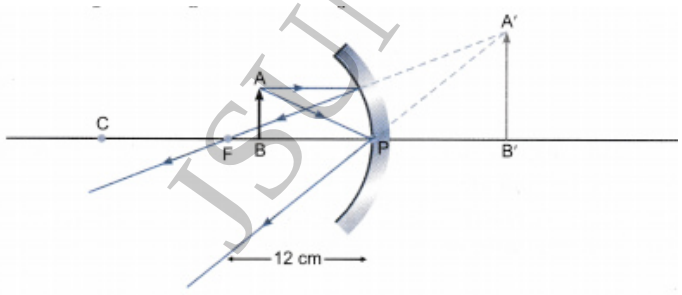
Marking Scheme for Sample Question Paper 2019-20

	SECTION A	
1	The property of self-linking of atoms of an element through covalent bonds in order to form straight chain, branched chains or cyclic chains of different sizes is called catenation.	1 mark
2	The valency of an element first increases and then decreases across a period.	1 mark
3(a)	The principle behind electric generator is Electromagnetic Induction- the phenomenon of producing current in a coil by changing the magnetic field associated with it.	1 mark
3(b)	The polarity of the output alternating current changes every 1/100 seconds. Alternately: In 1 second the output (AC) completes 50 cycles.	1 mark
3(c)	The suitability of Muppandal as a site for wind farms stems from its geographical location as it has access to the seasonal monsoon winds.	1 mark
3(d)	City A It is more suitable for a wind-farm as there is consistently high wind-speed in that city throughout the year.	0.5 mark 0.5 mark
4(a)	Diabetes	1 mark
4(b)	Insulin	1 mark
4(c)	iv) low sugar high fibre diet	1 mark
4(d)	i) 180mg/dL	1 mark
5	ii) pupils take time to adjust **OR** ii) refraction	1 mark
6	ii) = 40 Ω. V=IR, V = 4V, I = 100 mA = 0.1 A Hence R = V/I = 4/0.1 Ω = 40 Ω.	1 mark
7	i) volt-ampere Power = Voltage x Current.	1 mark
8	iv) Human faecal matter **OR** iv) The Industralist	1 mark
9	iii) Carbon monoxide	1 mark
10	iv) Decomposition of calcium carbonate to form quick lime and carbon dioxide.	1mark
11	i) Na_2CO_3	1mark

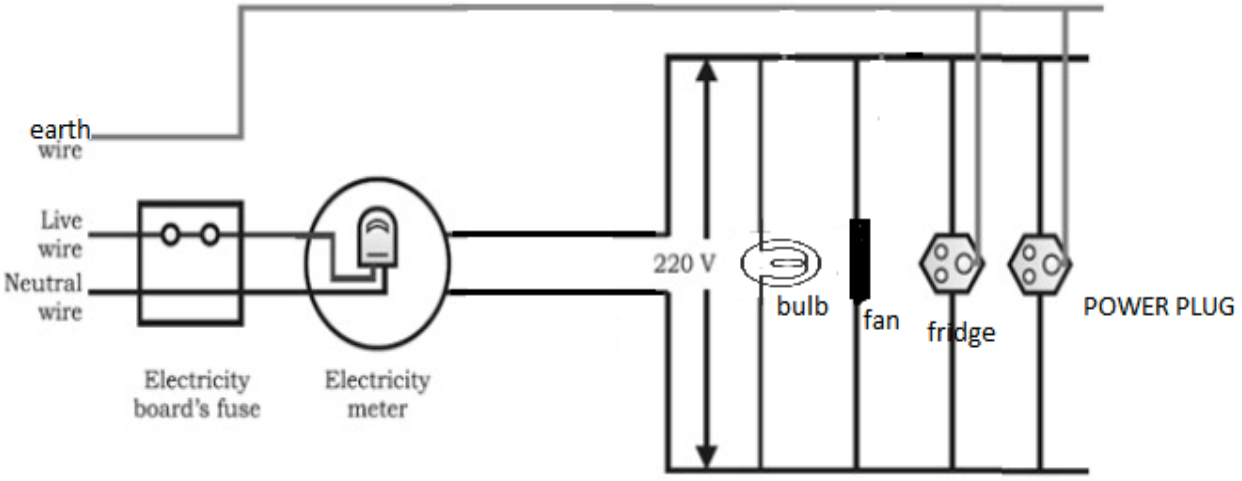
12	iii) C **OR** iii) Q and R	1mark
13	i) Both assertion and reason are true and reason is the correct explanation of assertion.	1mark
14	iv) Assertion is false but reason is true.	1 mark

SECTION B

15	(i) It turns yellow due to formation of lead oxide and Reddish brown fumes evolve. (ii) Thermal decomposition reaction. (iii) $2Pb(NO_3)_2 \xrightarrow{\text{heat}} 2PbO + 4NO_2 + O_2$	0.5 + 0.5 mark 1 mark 1 mark
16	(i) Sodium bicarbonate/Sodium hydrogencarbonate/ baking soda and its formula is $NaHCO_3$ (ii) $2NaHCO_3 \xrightarrow{\text{heat}} Na_2CO_3 + CO_2 + H_2O$ (iii) It is used in fire extinguisher and for baking. (any one) **OR** (i) Add 10 mL of concentrated sulphuric acid slowly to 90 mL of water with constant stirring. Dilution of acid is a highly exothermic process. If water is added to concentrated sulphuric acid, heat generated causes the mixture to splash leading to burns and the glass container can break. (ii) Decreases per unit volume.	0.5 + 0.5 mark 1 mark 1 mark 1 mark 1 mark 1 mark
17	Electronic configuration of X: 2,8,2, Y: 2,8,6 Both X and Y belong to 3rd period. Ionic bond will be formed. Reason: X will lose 2 electrons and Y will gain 2 electrons to complete their octet and become stable. Formula is XY	0.5 + 0.5 mark 0.5 mark 1 mark 0.5 mark
18	A food chain showing Ist tropic level (½ mark), IInd tropic level (½ mark), IIIrd tropic level (½ mark) and IVth tropic level (½ mark). *A flow chart or a diagrammtic representation showing all the four tropic levels would also be accepted* According to the 10% law, the amount of energy available will not be sufficient for the survival of the organism in the 5th trophic level. **OR** • Large jar filled with water, oxygen, food and aquatic plants and animals. • Oxygen/oxygen pump. • Fish food. • Aquatic plants/Producers provide O_2 during photosynthesis. • Aquatic animals/Consumers release CO_2 for the process of photosynthesis. • Decomposers are also important for natural cleaning of the aquarium. (0.5 mark for each point)	2 mark 1 mark 3 mark

19		1+1+1 mark
20	Let purple trait be represented by: PP White trait be : pp parental PP X pp ↓ F_1 Pp X Pp (Selfing) F_2 ↓ Gametes P p P PP Pp p Pp pp Visible characters of F1 progeny all flowers are purple coloured and in F2 progenies 3 are purple coloured and 1 is white coloured flower	0.5 + 1 + 0.5 mark 0.5 + 0.5 mark
21	When growing plant shoot tip detects light a hormone called auxin is synthesised in the shoot tip which is sensitive to light. Auxin diffuses towards the shady side of the stem. It stimulates the growth of cells on the shady side of the plant which causes bending of the plant to the other side. This gives the appearance that the stem of the plant bends in the direction of light.	1 mark 0.5mark 1 mark 0.5 mark
22	(i) Range of distance should be 0 cm to < 12 cm. (ii) The image will larger than the object.  *(0.5 mark to be deducted if no arrows marked or wrongly marked arrows)* (iii) Image will be at 24cm in front of the mirror or the image is formed at C	0.5 mark 1.5 mark 1 mark

23



1 mark

(i) Four components should be labelled. 0.5 + 0.5 mark

(ii) All of them should be in parallel and there should be a fuse for safety. 1 mark

(iii) Live and earth wires should be there.

(0.5 mark to be deducted if all parts of the diagram are not labeled)

24

(i) The phenomenon is called dispersion. 1 mark

(ii) X — Violet Y — Red 0.5 + 0.5 mark

(iii) Different colours of white light bend through different angles with respect to the incident beam of light due to difference in speed of light of different wavelengths. 1 mark

OR

(i) Visible spectrum is the band of coloured components of a white light beam . 1 mark

(ii) Red light is scattered the least by air molecules and has longer wavelength. It travels the longest distance. 1 mark

(iii) The given setup will behave like a glass slab, resulting in recombination of the seven colours to produce white light. 1 mark

SECTION C

25

Metal X is Zinc

The sulphide ore is first heated strongly in supply of oxygen and changed into its oxide. This process is called roasting. 1 mark

$$2ZnS + 3O_2 \xrightarrow{\text{heat}} 2ZnO + 2SO_2$$ 1 mark

Zinc oxide is then reduced to zinc metal by heating it with carbon. This process is called reduction.

$$2ZnO + C \longrightarrow 2Zn + CO_2$$ 1 mark

1 mark

OR

(i) As it reacts with both acids as well as bases to form salts. — 1 mark

(ii) Iron being more reactive than copper displaces copper from copper sulphate to form green ferrous sulphate solution. — 1 mark

(iii) Nitric acid is a strong oxidising agent. Hydrogen gas produced gets oxidised to H_2O. — 1 mark

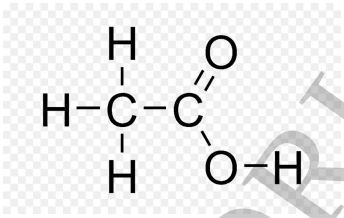
(iv) Calcium is a very reactive metal. It reacts with the chemicals in surroundings and occurs in combined state. — 1 mark

(v) Sodium and potassium are highly reactive metals and react vigorously with oxygen in air and may even catch fire. They do not react with kerosene. — 1 mark

26 (i) D is a saturated hydrocarbon — 0.5 mark

(ii) B is an organic acid. — 0.5 mark

Structural formula



— 0.5 mark

(iii) C is the compound. — 0.5 mark

It acts as a dehydrating agent and removes a water molecule from ethanol. — 0.5 mark

$$C_2H_5OH \xrightarrow{\text{hot conc. } H_2SO_4} C_2H_4 + H_2O$$

— 1 mark

(iv)

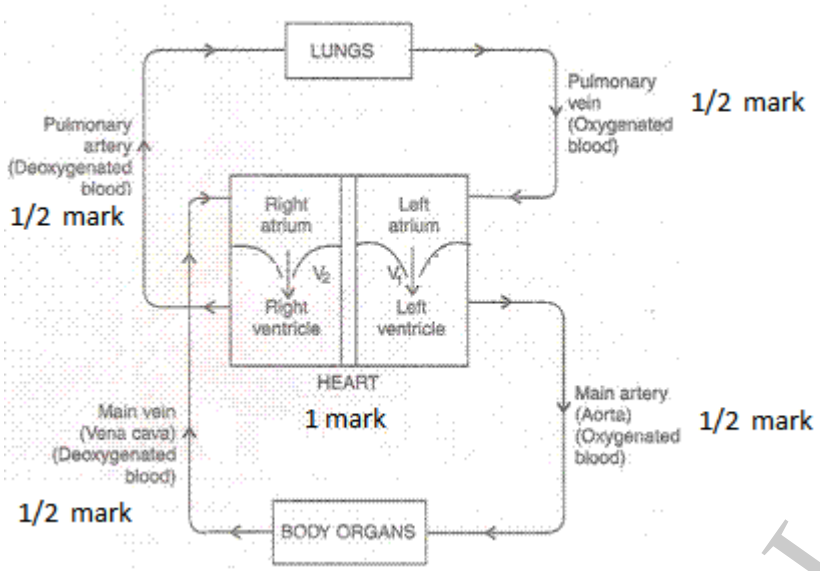
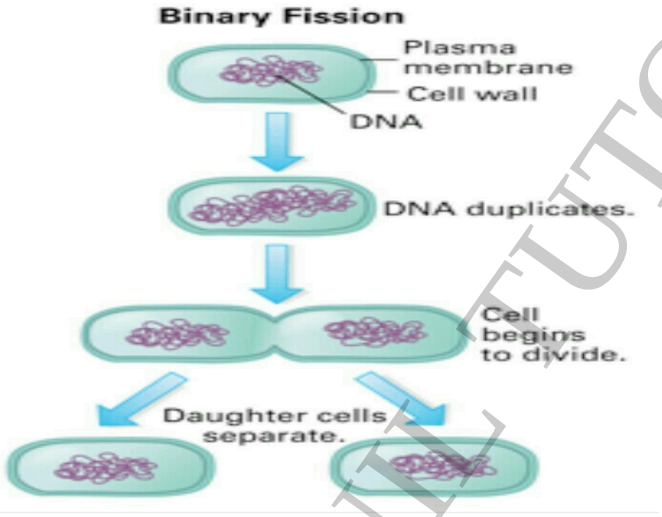
$$CH_3COOH + C_2H_5OH \xrightarrow{\text{conc } H_2SO_4} CH_3COOC_2H_5 + H_2O$$

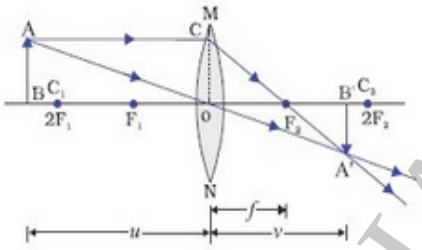
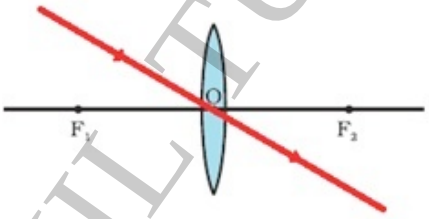
— 1 mark

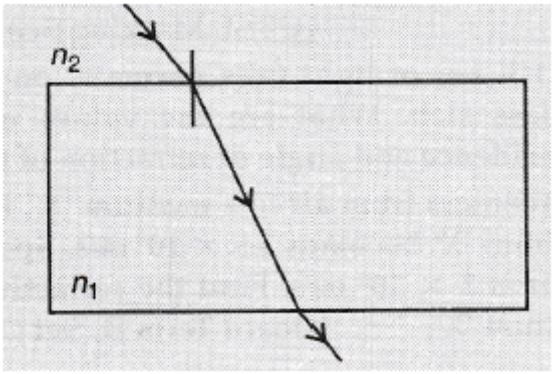
Major product is Ester and it is used in making perfumes / flavouring agents. — 0.5 mark

27 (i) Oxygenated : B/D/F [B= left ventricle/D=aorta/F=left auricle/pulmonary vein]

Deoxygenated: A/C/E [A= right ventricle/C= pulmonary artery/E=right auricle/vena cava]
(any two) — 0.5 + 0.5 + 0.5 +0.5 mark

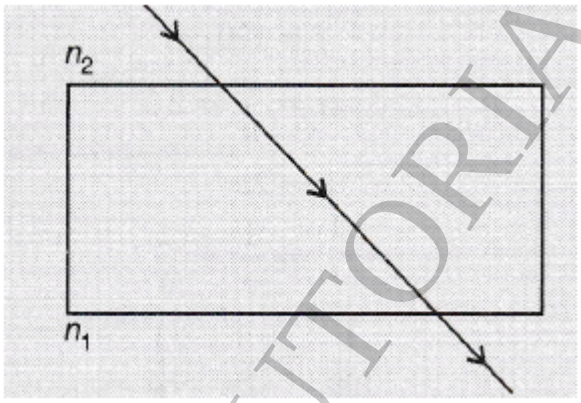
	(ii)  (*1 mark should be deducted if the arrows are not correctly marked*)	3 mark
28	(i)  (ii) Multicellular organisms cannot reproduce by cell because they are not simple random collection of cells. In them, specialized cells are organized as tissues which are organized into organs. Cell-by-cell division would be impractical. Multicellular organisms, therefore, require to use more complex ways of reproduction. **OR** (i) Prostate glands and seminal vesicle : add their secretions so that the sperms are in a fluid and it makes their transport easier and also provides nutrition.Testes secrete testosterone which brings about changes in the appearances in the boys at the time of puberty. (ii) Female foeticides/illegal sex selected abortion of female foeticide. (iii) Interfere in release of egg and eggs are not released.	3 mark 2 mark 3 mark 1 mark 1 mark
29	(i) Resistivity will not change as it depends on the nature of the material of the conductor. (ii) The length of each part becomes L/4. ρ,A constant. R=ρL/A. Resistance of each part = R_{part}= (ρL/4)/A = R/4.	1 mark 0.5 mark

	(a) In parallel the $\frac{1}{R_{eqv}} = \frac{1}{R_{part}} + \frac{1}{R_{part}} + \frac{1}{R_{part}} + \frac{1}{R_{part}} = \frac{4}{R_{part}} = \frac{16}{R} \rightarrow R_{eqv} = R/16\ \Omega$ (b) In series the $R_{eqv} = R/4 + R/4 + R/4 + R/4 = R\ \Omega$ (iii) $P = V^2/R$. If R_{eqv} is less, power consumed will be more. In the given case, R_{eqv} is lesser in the parallel and power consumed will be more.	0.5 mark 1 mark 1 mark 0.5 mark 0.5 mark
30	(i) The image will be real and inverted, since the magnification has negative value. The lens that can produce a real and inverted image is a converging/ convex lens. (1/2 *mark should be deducted if*  In the figure $OF_1 = OF_2 = 6$ cm. (Marks will be deducted if arrows are not shown) (ii) The girl must have directed the ray of light along the direction of the optical centre of the lens because the ray of light passes straight through the optical centre of the lens.  **OR** (i) Refractive Index of a medium (μ) = Velocity of light in vacuum / Velocity of light in the medium. Let the velocity of light in vacuum be v_1 and velocity of light in the medium be v_2. $v_1/2 = v_2$. Hence $\mu = v_1 / v_2$. $= v_1 / (v_1/2)$. $= 2$ (ii) (a) The ray moves towards the normal.	1 mark 2 mark 1 mark 1 mark 0.5 mark 1 mark 0.5 mark



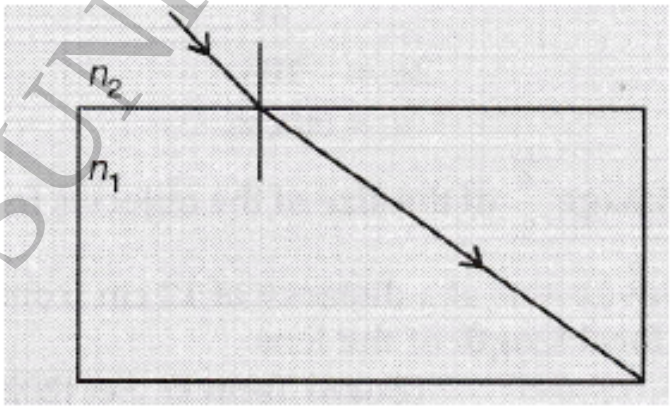
1 mark

(b) The ray moves undeviated.



1 mark

(c) The ray moves away from the normal.



1 mark