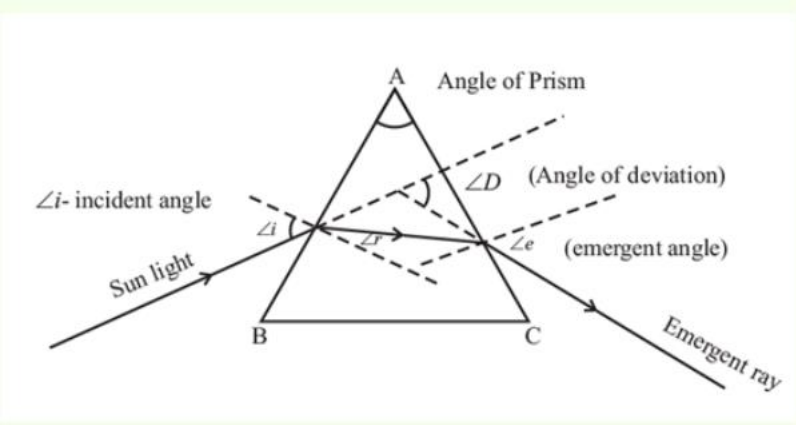
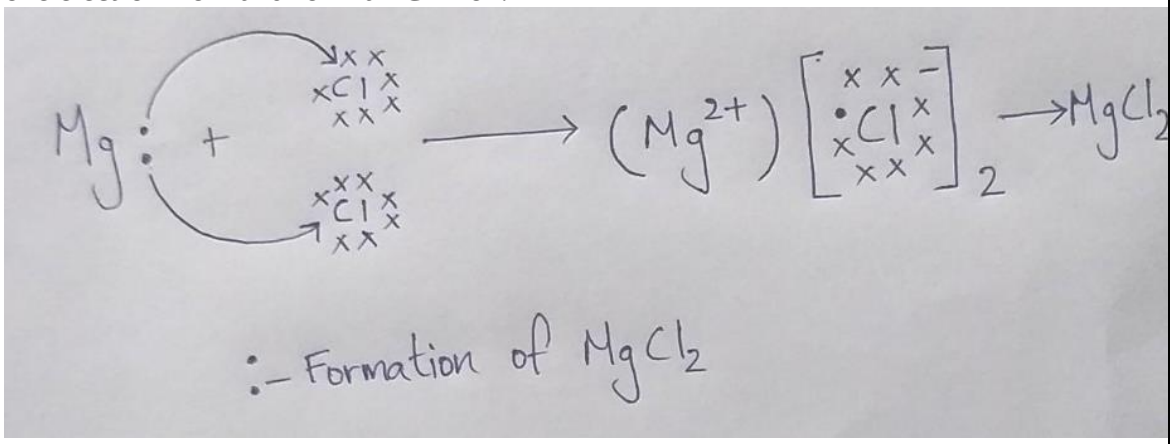
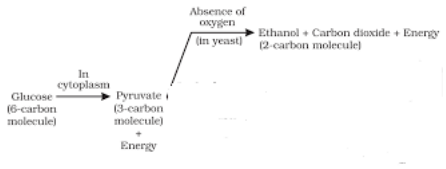
	SCIENCE MS	
	SECTION A	
1	c) Baking soda	1
2	a) decomposes by light	1
3	c) Cu	1
4	b) Butanal	1
5	a) $CaO + H_2O \rightarrow Ca(OH)_2$	1
6	b) $H_2SO_4(aq)$	1
7	a) Catenation	1
8	(c)I budding in yeast , II fission in Malarial parasite , III binary fission in leishmania, IV Propagation through vegetative leaves	1
9	(c) 1 and 3 only	1
10	(a) towards the lungs.	1
11	(b) Water	1
12	(c) (ii) and (iii)	1
13	(a) A	1
14	(a) forces both pointing into the plane of paper	1
15	(d) 1 Ω	1
16	(d) Outside the magnet, magnetic field lines go from South to North pole of the magnet.	1
17	a) Both A and R are true and R is the correct explanation of A.	1
18	(a) Both A and R are true and R is the correct explanation of A	1
19	(a) Both A and R are true and R is the correct explanation of A	
20	(c)A is true but R is false	
	SECTION B	

21		1(diagram) ½ + ½ (labelling)
	OR The **scattering** caused by these tiny air molecules (known as Rayleigh scattering) **increases as the wavelength of light decreases. Violet and blue light have the shortest wavelengths** and red light has the longest. Therefore, blue light is scattered more than red light and the sky appears blue during the day	1+1
22	Mg has 2 valence electrons and it is metal too. So, **Mg will lose two electrons** for the formation of Mg 2 + ion. As Cl atom has 7 valence electrons and is a halogen, it will gain one electron from and form an Cl - ion.  **OR** i) Pure metal as cathode & impure metal as anode ii) $AgCl/AgNO_3$	1 1 ½+½ 1
23	a) i)Diabetes ii)Insulin iii)Pancreas b) Cerebellum	½ + ½ + ½ + ½
24.	Biomagnification I mark Definition: 1 mark	1+1

	Biomagnification is defined as **the accumulation of a particular substance(non degradable chemical) in the body of the organisms at different trophic levels of a food chain**. One example of biomagnification is the accumulation of insecticide DDT which gets accumulated in zooplanktons	
25.	Ultrafiltration: Glomerulus reabsorption : tubular part of nephron	1+1
26.	a) Efficient supply of oxygen to body: to satisfy the energy needs, to maintain body temperature b) Because of residual volume OR a) Old xylem and vacuoles 1 m b) 1 m 	1+1
	SECTION C	
27	a) Barium sulphate, white colour ppt (b) $Na_2SO_4+BaCl_2 \rightarrow BaSO_4+2NaCl$ (c) Double displacement/precipitation	½+½ 1 1
28	A- Cl_2, B- $CaOCl_2$, Bleaching powder $2\ NaCl + 2\ H_2O \rightarrow 2NaOH + Cl_2 + H_2$ $Cl_2 + Ca(OH)_2 \rightarrow CaOCl_2 + H_2O$	½+½ 1 1
29.	a)i)small intestine ii) lipase iii) fatty acids and glycerol ½ + ½ + ½ b) Peristalsis ½ the rhythmic contraction and relaxation of lining of alimentary canal muscles which push the bolus forward in the canal is known as peristalsis 1	3
30.	For solving the above given question, we will be using the mirror formula, i.e., $1/f = 1/v + 1/u$ **Complete answer:** Before we start solving the question, let us take a look at all the given parameters f = -15 cm Negative sign as the mirror is a concave mirror u = -10 cm Now, for the Part A By using the given values	

$$\Rightarrow \frac{1}{-15} = \frac{1}{v} + \frac{1}{-10}$$

$$\Rightarrow \frac{1}{v} = \frac{1}{10} - \frac{1}{15}$$

$$\Rightarrow \frac{1}{v} = \frac{1}{30}$$

1

So,
v = 30 cm

Now, for the Part B

By using the formula for the magnification of the image

We have

$$m = \frac{v}{u}$$

$$\Rightarrow m = \frac{30}{10}$$

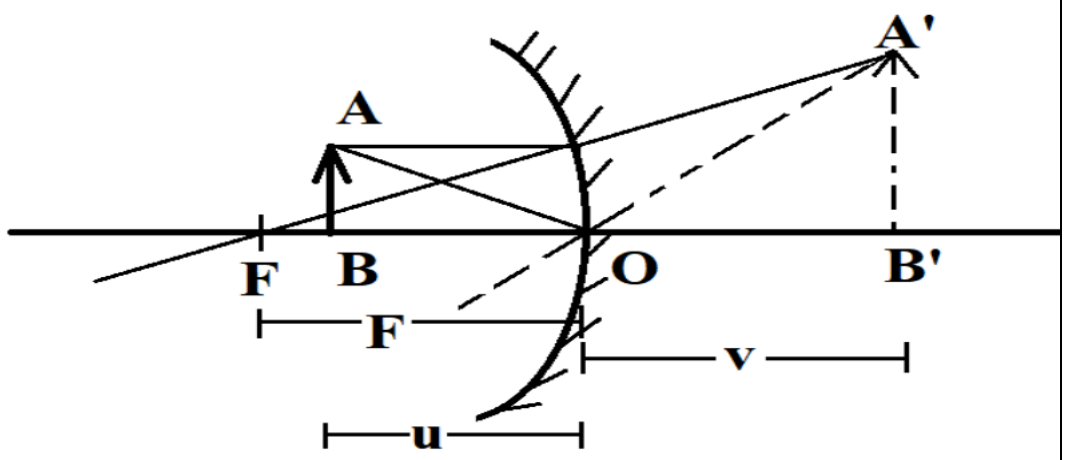
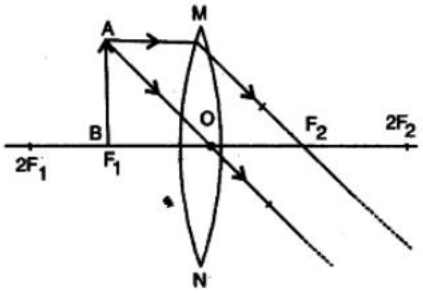
$$\Rightarrow m = 3$$

So, the image will be highly magnified in size.

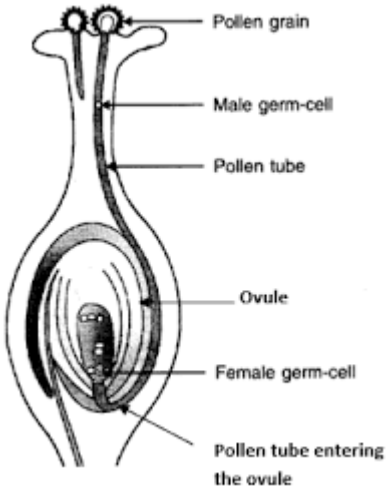
Part C

The image will be Virtual and Erect in nature as v is positive

½

		1 ½
31	(a) It is the central point of the lens through which a ray of light passes without suffering any deviation. (b) The object will be placed at F.  (c) f = - 20 cm, u = ?, v = - 15 cm, h = ?	1 1 1

	Using the expression $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$, we have $\frac{1}{-20} = \frac{1}{-15} - \frac{1}{u}$ u = 60 cm Object must be kept at 60 cm to the left from the lens.	
32.	Answer the following questions : (i) North pole to south pole. (ii) Tesla(T) (iii) The strength of magnetic field is higher in this region. (OR) (a) Due to the force exerted by the magnet within its magnetic field. (b) The pattern of lines demonstrates magnetic field lines. (c) It is because of Crowding of iron filings at the ends of the magnet and it indicates that the magnetic field is strongest near the poles of the magnet, and the magnetic field lines are closest at these locations and hence forms closed curves.	1 1 1 1 1 1
33.	According to 10 percent law, ½ **m** Explanation:90% of the energy captured from the previous trophic level is lost to the environment and only 10 percent is made available to the next trophic level.**1m** In this food chain, at the 4th trophic level, 5 kJ energy is available to the snake ⇒ Energy available to Frog = 10% of 50 kJ ½ **m** ⇒ Energy available to Grasshopper = 10% of 500 kJ ½ **m** ⇒ Energy available to Grass = 10% of 5000 kJ. ½ **m**	3
	SECTION D	
34	(a) homologous series- any two characteristics – CH_2 difference/ molecular mass by 14 u …(any two pts x 1/2=1), C_6H_{14} (1/2) – hexane (1/2) c) Esterification -1 chemical reaction- 1 d) saturated HC- C_4H_{10}, C_6H_{14} (½+½) OR (a) alkaline KMnO4 acts as oxidizing agent-1, alcohol → acid (chemical eq – 1 mark)	5

	(b) same molecular formula, different structural formula-(1), isomers of pentane- (½+½) © Soaps are sodium or potassium salts of long chain carboxylic acids. Detergents are ammonium or sulphonate salts of long chain carboxylic acids (1)	
35	i)Four methods of contraception are • Barrier method: use of condoms. • Surgical methods: vasectomy (in male), tubectomy (in female). • Intrauterine devices: copper T. • Oral contraception: oral hormonal pills**. 1 m** These methods help to take care of mother and child. It also helps in maintaining a gap between the children so that they can use resources properly. **1 m** **iii) Diagram 1 ½ m** a. oviduct ½ b. uterus ½ c. ovary ½ OR **i)** One male gamete of pollen tube fuses with the egg of ovule forming zygote and another male gamete fuses with the polar nuclei forming endosperm. **1 m** Ovary becomes fruit after fertilization and ovule becomes seed after fertilization **½ + ½ m** **ii) 2 marks diagram + 1 m labelling** 	1+1

36.	(a) R_1 , R_2 in series with R_3 ll R_4 $R_1 + R_1 + \frac{R_3R_4}{R_3+R_4}$ (b) Joule's law of heating states that power of heating generated by an electrical conductor is proportional to the product of its resistance (R) and square of the electric current passing through the conductor with time. (c) Let the number of resistors required be x. So, **equivalent resistance** is : $\frac{1}{R_{eq}} = \frac{1}{132} + \frac{1}{132} + ... + x\ times$ $\implies \frac{1}{R_{eq}} = \frac{x}{132}$ $\implies R_{eq} = \frac{132}{x}\ ohm$ Now, as per **Ohm's Law:** $V = i \times R_{eq}$ $\implies 220 = 5 \times \frac{132}{x}$ $\implies x = 5 \times \frac{132}{220}$ $\implies x = \frac{660}{220}$ $\implies x = 3$ **So, 3 resistors are required.**	1 1 1 2
	SECTION E	
37	a) displacement reactions- def-1 b) copper s displaces silver from the silver nitrate solution and the colour of solution changes from colourless to blue due to the formation of copper nitrate. The copper coin will disappear and silver will precipitate out. (1) c) The substance reduced- MnO_2 and reducing agent -Al (2) OR Thermite process- 1 . $Fe_2O_3+2Al \rightarrow 2\ Fe+Al_2O_3+heat$ 1	
38.	a) all of them have violet flowers	1

	b) ¼ of them have white flowers and ¾ of them violet flowers c) genotype ratio is 1:2:1 • homozygous dominant • heterozygous dominant • homozygous recessive OR d) law of dominance : Statement: Mendel's law of dominance states that: "**When parents with pure, contrasting traits are crossed together, only one form of trait appears in the next generation**. The hybrid offsprings will exhibit only the dominant trait in the phenotype." Law of dominance is known as the first law of inheritance.	1 1 1 1 1
39.	(a) It is expressed as the ratio of the height of the image to the height of the object. (b) A negative magnification indicates that the image is real and inverted. (c) R = 2f; f=R/2 = 32/2 = 16cm (OR) (c) The principal focus of the spherical mirror lies **midway between pole and center of curvature**.	1 1 2