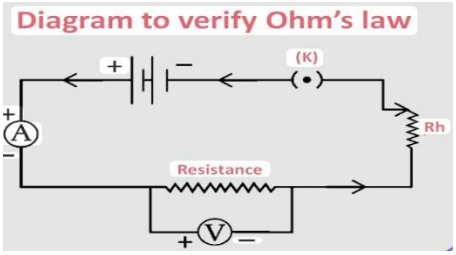
	BCM SCHOOL BASANT AVENUE DUGRI, LUDHIANA Class: X Subject: Science. Chapter- Answerkey Carbon and Its Compounds, Electricity Date: November 8,2025	
I	**Multiple Choice Questions**	
1	a	
2	b	
3	c	
II	**Assertion–Reasoning Questions**	
4	a	
5	c	
6	 current is directly proportional to p.d. V-I graph is straight line passing through the origin with constant slope with x axis.	
7	**P = Ethanol (C_2H_5OH)** (constituent of wine). **Q = Ethanoic acid (CH_3COOH)** (product on oxidation). **R = Hydrogen (H_2)** (gas evolved with sodium; burns with pop). **Reactions (balanced, simplest forms):** Oxidation of ethanol to ethanoic acid (with oxidising agent): $CH_3CH_2OH + [O] \rightarrow CH_3COOH + H_2O$ (in lab: acidified $K_2Cr_2O_7$ oxidises ethanol to ethanoic acid)	

	Reaction of ethanoic acid with sodium: $2CH_3COOH + 2\ Na \rightarrow 2CH_3COONa + H_2\uparrow$	
8	(a)(i) **Product structural formula & name:** **Methyl ethanoate** (methyl acetate): CH_3COOCH_3 (structural: $CH_3–C(=O)–O–CH_3$). (b) **Name of reaction:** esterification **Equation:** $CH_3OH + CH_3COOH \rightleftharpoons CH_3COOCH_3 + H_2O$ (conc. H_2SO_4 as catalyst). (c) **Why pleasant smell?** Esters (like methyl ethanoate) are volatile compounds that typically have fruity/pleasant odours and interact with olfactory receptors to give a pleasant aroma.	
9	(a) No current will flow through the conductor as it will be open circuit. (b) When both key are closed R'=R1+R2 =8ohm R''=R3+R4=8ohm R in parallel=4ohm I=v/I = 12/4=3A (c) When k1 is closed R=R1+R2= 8ohm I=V/I = 12/8 = 1.5A	
10	**Reaction of ethanol with sodium:** $2\ C_2H_5OH + 2\ Na \rightarrow 2\ C_2H_5ONa + H_2\uparrow$ (product sodium ethoxide + hydrogen gas) (b) **Why ethanol is mixed with petrol:**	

	• To raise octane rating and reduce engine knocking. • To act as an oxygenated renewable additive (reduces some harmful emissions) and partly replace fossil fuel (bioethanol). (c) **Two harmful effects of consuming ethanol:** • **Liver damage** (fatty liver → hepatitis → cirrhosis). • **Central nervous system depression —** impaired coordination, judgement, long-term brain damage and addiction; risk of fetal alcohol syndrome if consumed during pregnancy.	