

केन्द्रीय माध्यमिक शिक्षा बोर्ड, दिल्ली
Central Board of Secondary Education, Delhi

Fictitious Roll No.
(To be entered by Board)

(परीक्षार्थी भरे To be filled in by the candidate)

परीक्षार्थी प्रश्न-पत्र के ऊपर लिखे कोड को दर्शाये गये बॉक्स में लिखें
Candidate should write code no. as written on the
top of the question paper in this box

31/3

अतिरिक्त उत्तर-पुस्तिका (ओं) की संख्या
No. of supplementary answer-book (s) used

X

परीक्षा का नाम Name of the examination ATSSSE 2013

कक्षा Class X

विषय Subject Science 086

परीक्षा का दिन एवं तिथि

Day & Date of the Examination Thursday, 14/3/2013

उत्तर देने का माध्यम Medium of answering the paper English

किसी शारीरिक अक्षमता से प्रभावित हो तो सम्बन्धित

वर्ग में ✓ का निशान लगायें

B D H S C

B = दृष्टिहीन, D = मूक व बधिर, H = शारीरिक रूप से विकलांग, S = स्पास्टिक, C = डिस्लेक्सिया

If Physically challenged, tick the category

B = Blind, D = Deaf & Dumb, H = Physically Handicapped, S = Spastic, C = Dyslexic

क्या लेखन-लिपिक उपलब्ध करवाया गया : हां / नहीं

Whether writer provided : Yes / No.

उत्तर देने का माध्यम Medium of answering the paper

{ SECTION A }

Ans 1: Element A: 2, 8, 1
Element B: 2, 8, 7
Element C: 2, 8, 8, 1

Element A and C will show similar chemical properties because they have same number of valence electrons. As chemical properties are determined by number of valence electrons. So element A and C will have similar chemical properties.

Ans 2: In human females fertilisation takes place in fallopian tube.

Ans 3: Biodiversity is sum total of the individuals of species of flora and fauna. Biodiversity needs to be conserved because it maintains ecological balance.

Ans 4: a) Leishmania reproduce by binary fission whereas Plasmodium reproduce by multiple fission.

- b) In leishmania single cell divide to form two identical daughter cells in definite plane whereas in plasmodium single cell divide to form more than two daughter cells.

Ans 5: The ability of lens to bend the light is called power of lens.
Power of lens is reciprocal of its focal length.

$$P = \frac{1}{F(m)}$$

SI unit of power is diopter (D).

Power is said to be 1 diopter if the focal length of lens is 1m.

Ans 6: Effects of plastic bags:

1. Plastic bags are non-biodegradable. so they persist in atmosphere for long time and require dumping sites.
2. These are easily absorbed by plants and animals and can cause biomagnification in food chain.

Plastic bags can be avoided by using paper bags or cloth bags.

Ans 7: Sustainable management of natural resources is necessary because:-

1. It conserves the resources that may be get depleted.

2. The depletion of one resources affects other resources.

Foreg deforestation only ~~lack~~ the forest produce but also affect the sources of water.

We should prefer reuse because in recycling some energy is used whereas in reuse it is not. In reuse, we can use the things like plastic and glass bottles again and again.

Ans 8:

a) i) Litmus Test:

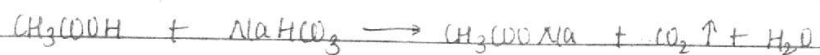
There will be no effect on litmus paper on adding it to ethanol because ethanol is neutral.

whereas the blue litmus paper will turn red on being added to ethanoic acid indicating its acidic nature.

ii) reaction with sodium hydrogen carbonate

No brisk effervescence will be observed when NaHCO_3 will be added to ethanol.

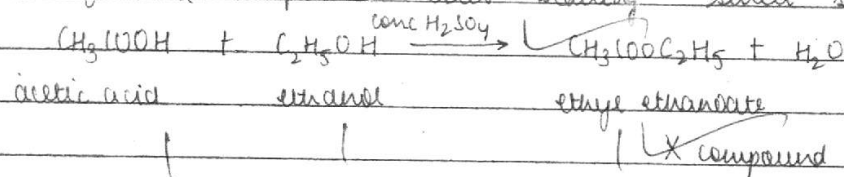
vigorous brisk effervescence will be observed when NaHCO_3 will be added to ethanoic acid due to release of carbon dioxide gas.



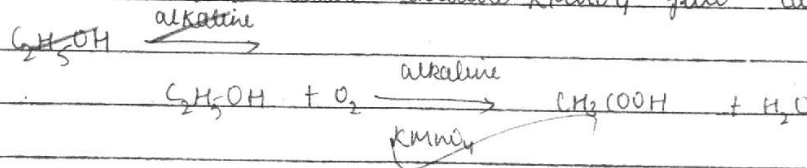
b) Following oxidising agents are used in conversion of ethanol to ethanoic acid.

1. acidified potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$)
2. alkaline potassium permanganate (KMnO_4)

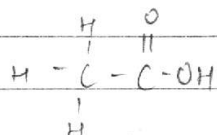
Ans 9: A carboxylic acid react with an alcohol in the presence of H_2SO_4 to form a compound ester having sweet smell.



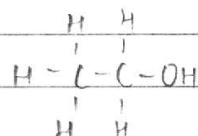
The alcohol on oxidation with alkaline KMnO_4 give carboxylic acid.



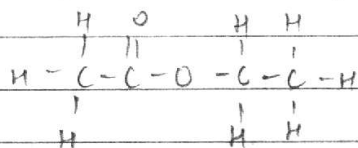
i) Carboxylic acid is ethanoic acid CH_3COOH



ii) alcohol is ethanol $\text{C}_2\text{H}_5\text{OH}$



iii) the compound X is ethyl ethanoate $\text{CH}_3\text{COOC}_2\text{H}_5$



Ans 10:

Atomic NO: 20

Electronic configuration: 2, 8, 8, 2

a) valency of the element is 2 as it have 2 electrons in its valence shell

b) The element X is metal because it have 2 electrons in its valence shell.

Q) atomic no. of Y : 8

electronic configuration: 2, 6

valency: -2

the formula of compound formed when element 'X' reacts with an element 'Y' is XY .

element X is calcium

element Y is oxygen

Compound : CaO

Ans 11: electronic configuration of element 'X' is 2, 8, 8, 2

a) It belongs to fourth period of modern periodic table because it has four shells.

b) It belongs to second group as it has 2 electrons in its valence shell. valency of element is +2 because it will lose its two electrons to attain stability.

Ans 12: METHODS OF CONTRACEPTION ARE:

1. Barrier Method: Barrier method make use of the physical devices such as condoms, diaphragms, cervical caps etc. These

device allows sperm to enter the female genital tract and hence fertilisation does not take place.

2. Chemical methods: Chemical methods involve the use of pregnancy pills or oral pills by female. These are hormonal preparations that inhibit the egg formation and hence fertilisation cannot take place.

3. Surgical methods: Surgical methods involve vasectomy in males and tubectomy in female. In vasectomy a cut is given by vas deferens and ligated and in tubectomy a cut is given in fallopian tube.

4. Intra uterine contraceptive device: Intra uterine contraceptive device or copper - T is placed safely in uterus by doctor which prevents implantation.

EFFECTS ON HEALTH AND PROSPERITY OF FAMILY:

1. Swallowing of oral pills can have little ill impact on female body.
2. Placing of copper - T can cause irritation.
3. These methods can be used to prevent frequent pregnancies and control population.

Ans 13:

Placenta is a special tissue embedded in the inner lining of uterus that meets the respiratory, excretory and nutritional requirements of developing fetus.

Placenta is embedded in uterine wall. On the embryo's side it has villi and on mother's side blood space is present which surrounds the villi. It provides enough space for ~~entire~~ oxygen and glucose to pass from mother's blood to fetus. The fetus also generates waste which is removed by placenta into mother's blood.

Ans 14:

	Male pea plant	X	Female pea plant	
	♂		♀	
Phenotype	Tall		Dwarf	
Genotype	TT		tt	
Gametes	T T	Punnett square table	t t	
	(T) (T)		(t) (t)	
1st generation:	X	t	t	
	T	Tt	Tt	Hybrid tall
	T	Tt	Tt	

Hybrid tall $\times$ Hybrid tall

Ft

Tt

Tt

Tt

F_2 generation (self cross)

	$\times$	T	t
T		TT	Tt
t		Tt	tt

Phenotypic ratio: 3:1

Genotypic ratio: 1:2:1

a) The phenotype of F_1 progeny is 100% Hybrid tall because tall trait being dominant is able to express itself whereas dwarf trait being recessive fail to express itself.

b) Phenotypic Ratio of F_2 progeny is

3:1

c) In F_2 generation progeny all the traits i.e. tall and short are present whereas in F_1 progeny only tall was seen this is because tall being the dominant was able to express itself whereas dwarf cannot. Presence of short trait in F_2 progeny suggest that both are it

was interested in F. prorigens but was not able to express.

Ans 15:

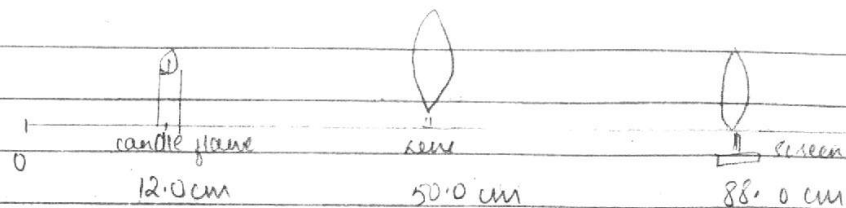
Fossils are impressions or remains of ancient life found preserved in sedimentary rocks.

Every organism die and is lost in the environment. But every once a while there are some organisms that might caught in such atrop environment that donot allow to decompose completely. For eg: if an insect get caught not mud it will not decompose quickly the soil will harden and retain impression of body part of insect on it.

METHODS OF DETERMINING AGE OF FOSSILS:

1. Relative method: If we dig into the earth. The fossils we find closer to earth will be recent ones whereas the ones found from depth will be older.
2. Carbon dating: In this method ratio of isotopes of same element is calculated.

Ans 16:



$$\text{Object distance } (u) = 12 - 50$$

$$= -38 \text{ cm}$$

$$\text{Image distance } (v) = 88 - 50$$

$$= 38 \text{ cm}$$

i) Focal length of convex lens?

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \Rightarrow \frac{1}{f} = \frac{1}{38} - \frac{1}{-38} \Rightarrow \frac{1}{f} = \frac{1}{38} + \frac{1}{38} = \frac{2}{38} = \frac{1}{19}$$

$$f = 19 \text{ cm}$$

ii) $f = 19 \text{ cm}$, $u = 31 - 50 = -19 \text{ cm}$, $v = ?$

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \Rightarrow \frac{1}{19} = \frac{1}{v} - \frac{1}{-19} \Rightarrow \frac{1}{19} = \frac{1}{v} + \frac{1}{19}$$

$$\Rightarrow \frac{1}{19} - \frac{1}{19} = \frac{1}{v} \Rightarrow 0 = \frac{1}{v}$$

Image will be formed at infinity

$$\begin{array}{r} 90 \\ 12 \\ \hline 58 \end{array}$$

$$\begin{array}{r} 90 \\ 12 \\ \hline 38 \end{array}$$

$$\begin{array}{r} 88 \\ 12 \\ \hline 38 \end{array}$$

$$\begin{array}{r} 88 \\ 50 \\ \hline 38 \end{array}$$

$$\begin{array}{r} 100 \\ 31 \\ \hline 19 \end{array}$$

$$\begin{array}{r} 19 \\ 2/38 \\ \hline 2 \end{array}$$

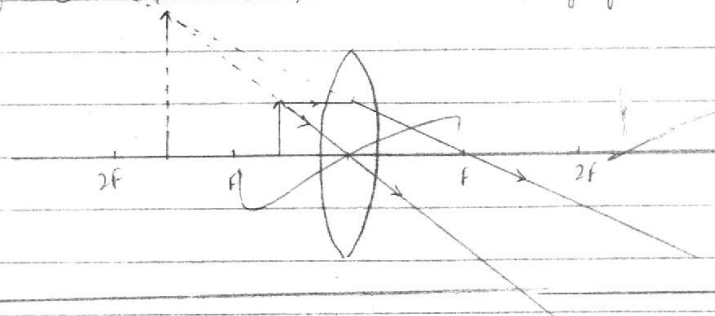
$$\begin{array}{r} 19 \\ 7 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 19 \\ 19 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 19 \\ 19 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 19 \\ 19 \\ \hline 0 \end{array}$$

- iii) If the candle flame is further shifted towards the lens the image formed will be virtual, erect and magnified.



Ans 17:

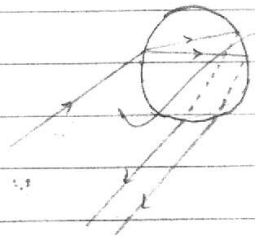
- i) Concave mirror is used by dentist because it forms virtual, erect and magnified image.
- ii) Concave mirror is used in solar furnace because it concentrates the parallel beam of light at focus.

Ans 18:

The band of seven colours seen in the sky just after the rain is called rainbow. To see a rainbow we have to stand with our back towards the sun.

The rainbow is formed by refraction of light. Tiny water droplets in the atmosphere act as prisms. The light incident on these water droplets gets refracted and it splits into its seven colours.

it travels inside the droplet and get reflected inside. when the light ray comes out it further get refracted. so with refraction and reflection a band of seven colours is seen on the other side.



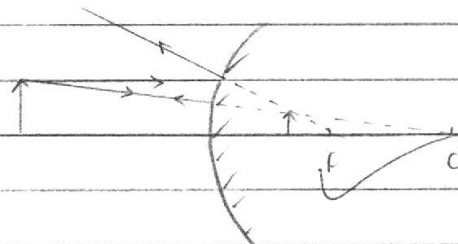
Ans 19: Non-biodegradable substances are not decomposed into simpler substances and affect the environment in following ways:

1. They persist in the environment for long time and thus need land area for dumping.
2. They are easily absorbed by aquatic plants and animals and cause biomagnification in foodchain.
3. They are made up of harmful chemicals and can change soil chemistry and fertility.

METHODS OF SAFE DISPOSAL OF NON-BIODEGRADABLE SUBSTANCES:-

1. Non-biodegradable waste should be safely dumped in waste land.
2. They should not be disposed in water bodies.
3. They should be reused as much as they can be.
4. Limiting the use of non-biodegradable substances.

Ans 20: A spherical mirror 'A' always forms an erect image of an object so it should be convex mirror because convex mirrors always form virtual and erect image of whatever the position of object may be.



A spherical mirror 'B' forms erect as well as inverted image of an object. so it is a concave mirror because it forms both erect and inverted image.

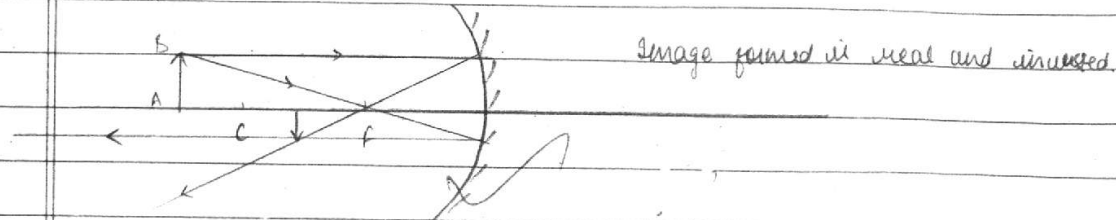


Image formed is real and inverted.

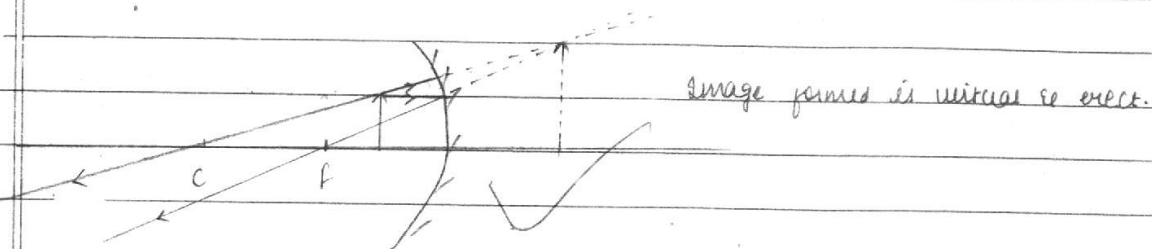


Image formed is virtual & erect.

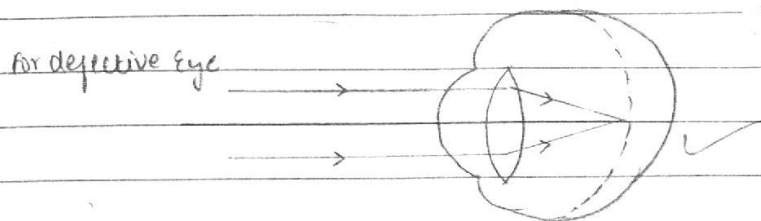
Ans 21:

a) A student is suffering from myopia.

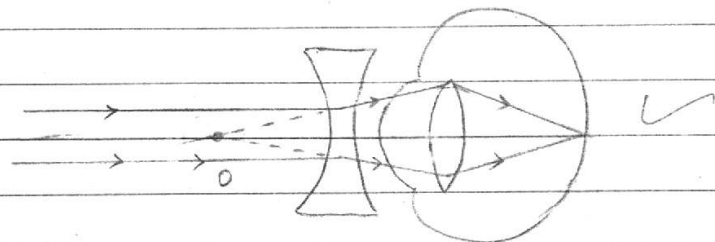
CAUSES:

1. Elongation of Eyeball: when eyeball becomes enlarged i.e. larger than normal. Then as a result the distance between retina and lens increases. Then even for maximum focal length lens is not able form the image on retina. Then parallel rays of light coming from distant object get focused before retina.

- a. It may occur if due to some abnormality the curvatures of lens or cornea decreases then the focal length becomes shorter than normal.



- b) This defect can be corrected by using concave lens of suitable focal length.



- c) I will help by signing an agreement to donate my eyes after my death because it will be my pleasure to make something see the beauty the ~~earth~~ world.

Ans 2: CAUSES OF HUMAN POPULATION EXPLOSION:-

1. Uncontrolled frequent pregnancies: Due to uncontrolled frequent pregnancies the birth rate is increasing from death rate causing a rise in population.
2. Improvement in health services: Due to improvement services today the death rate decreased so much causing overpopulation.

METHODS TO CHECK EXPLOSION:-

1. By preventing the frequent pregnancies by taking oral pills or using condoms.
2. By spreading the awareness among people to adopt family planning method.
3. By making some laws ^{and telling} ~~existing~~ the people to take just one or two children.
4. By conducting the seminars, debates and writing articles on increasing population we can spread awareness among people.

Ans 23: The transfer of pollen grains from anther to stigma of same flower or anther is called pollination.

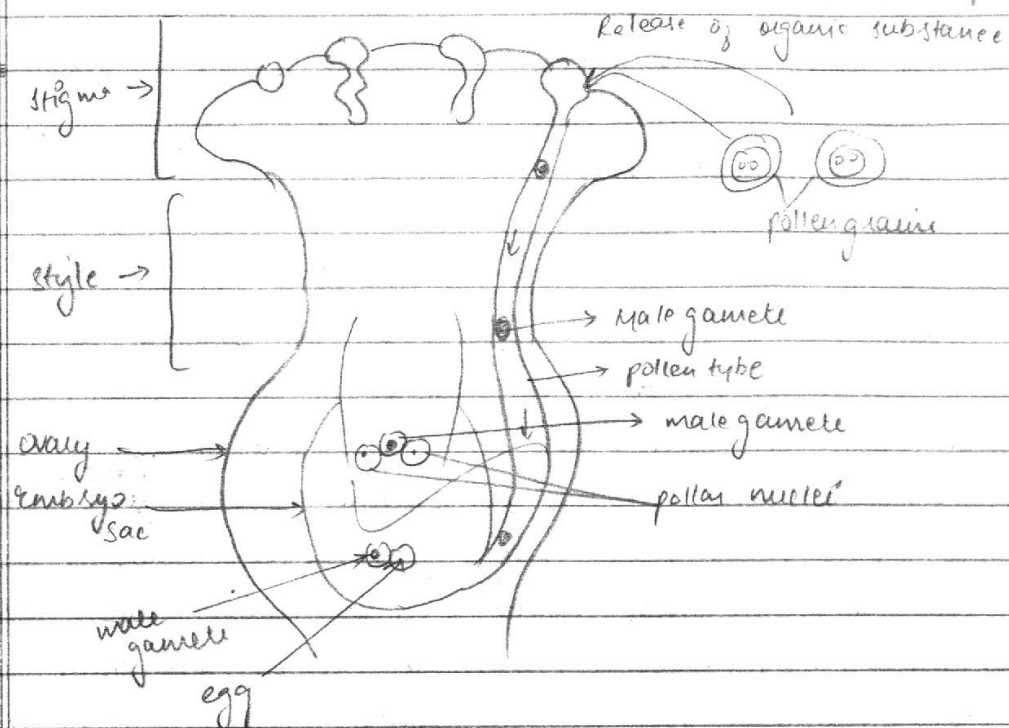
Pollination can be of two types:

1. self pollination

2. cross pollination.

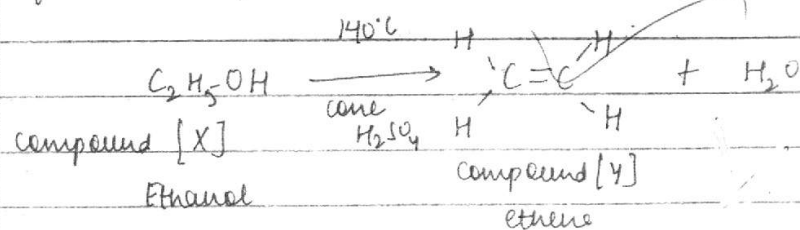
In plants pollination occurs when pollen grains are carried by agencies like wind, animals, insects from anther of one flower to stigma of another flower of same plant or other plant of same species.

* After pollination when stigma receive pollengrain. The stigma ~~attract~~ ^{release} an organic substance and pollen grain grows into a pollen tube & reaches to ovary through style. In ovary male gametes fuse with female gametes (ova) present in ovule. This fusion of male and female gamete is called fertilisation. One male gamete fuses with female gamete and form zygote which divide rapidly to form embryo. Another male gamete fuses with two polar nuclei and form primary endosperm nucleus so the double fertilisation takes place.

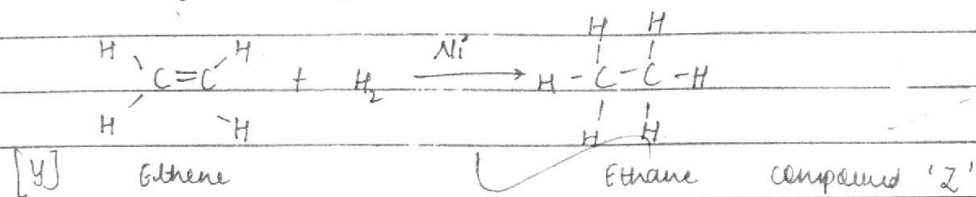


Ans 24:

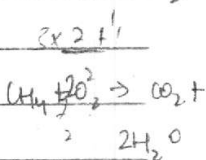
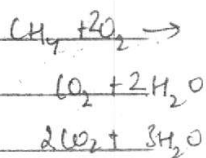
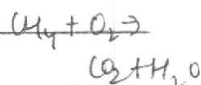
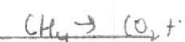
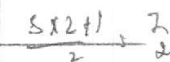
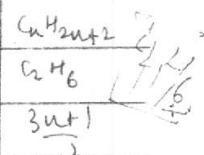
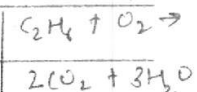
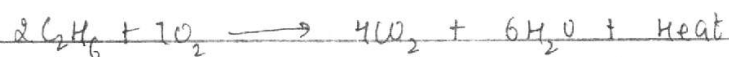
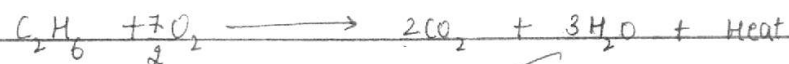
An organic compound 'X' i.e. Ethanol on heating with conc. H_2SO_4 forms a compound 'Y' which is ethene.



Compound 'Y' i.e. ethene on addition of one mole of hydrogen in the presence of nickel forms a compound 'Z' which is ethane.



Compound Z i.e. ethane on combustion forms two molecules of CO_2 and three molecules of water.



SECTION - B

- Ans 25: (D) ✓ IV, V and I
- Ans 26: (C) ✓ III, IV
- Ans 27: (B) ✓ II, IV
- Ans 28: (D) ✓ Plumule, Cotyledon, Radicle
- Ans 29: (B) ✓ Carrot and radish
- Ans 30: (A) ✓ P and d
- Ans 31: (A) ✓ favour the precipitation of soap
- Ans 32: (B) ✓ 1, II and IV
- Ans 33: (D) ✓ It smells like vinegar and turn blue litmus red
- Ans 34: (B) ✓ a ~~to~~ bubbles of a colourless and odourless gas
- Ans 35: (B) ✓ The device X is concave mirror of focal length 30 cm.
- Ans 36: (C) ✓ lens and the image (screen)
- Ans 37: (D) ✓ I, II and IV
- Ans 38: (B) ✓ II, III and IV
- Ans 39: (D) ✓ X, M and Z
- Ans 40: (B) ✓ 7 to 10 cm
- Ans 41: (C) ✓ 30° and 60°

answ: (A) $L_i = L_e \geq L_v$



