

Answer

Series JSR

CBSE BOARD PAPER MARCH 2016 SCIENCE

SET-2



Code No. 31/2

## SUMMATIVE ASSESSMENT - II SCIENCE

Time allowed : 3 hours

Maximum Marks : 90

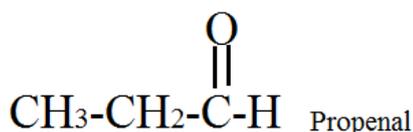
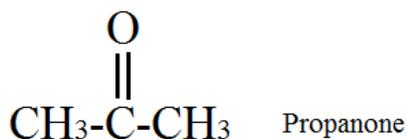
Hints and answer: SET-2

1. Butanol C<sub>4</sub>H<sub>9</sub>OH
2. Bisexual, Mustered
3. Depletion of ozone layer
4. Real, inverted, larger in size, Concave mirror
5. Forests are 'biodiversity hot spots' because variety of organism found here and they get benefited to one another.
6. Water harvesting is process of collecting and utilization of water. This includes watershed management, capturing runoff from streams and catchments. It is a good technique of meeting shortage of water as it helps in recharging groundwater
7. X is ethanol and y is hydrogen



Dehydration of ethanol to give ethene (C<sub>2</sub>H<sub>4</sub>)

8. Aldehyde: RCHO      Ketone: ROR



In aldehydes, the (C=O) is found at the carbon chain's end. This means that the (C) carbon atom will be bounded to a hydrogen atom plus another carbon atom. With ketones, the (C=O) group is usually found at the center of the chain. Thus, the carbon atom in the C=O will be linked to two separate carbon atoms at each side.

9. (a) Group 16 valence electron = 6 and valency = 2

b. compound H<sub>2</sub>X



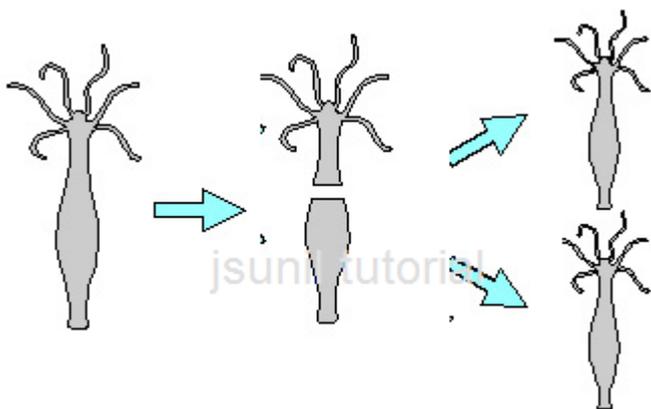
c. Sulphur, non metallic

10. x atomic no. 7 = 2,5 ; y atomic no. 8 = 2,6 and Z atomic no. 9 = 2,7

a. They belong to 2<sup>nd</sup> period 15<sup>th</sup>, 16<sup>th</sup> and 17<sup>th</sup> group    b. Z,Y,X    c. NF<sub>3</sub> (Nitrogen trifluoride)

11. The mode of asexual reproduction in which an individual cut or broken up into many pieces and these pieces grow into separate individuals is called regeneration.

Regeneration is carried out by specialized cells. These cells proliferate and make large numbers of cells . Hydra cut into two pieces and each piece grows into a complete organism.



12. In fission organism like amoeba simply split into two equal halves during cell division. it occurs in unicellular organism.

In f fragmentation organism like spirogyra simply breaks up into smaller pieces upon maturation. it occurs in multi-cellular organism.

13. a. Genetic drift, mutation

b. (a) Pollen grain                      (ii) stigma                      (iii) pollen tube

(iv) after fertilization zygote is formed. Zygote divides several times to form an embryo within the ovule. The ovule develops a tough coat and is gradually converted into a seed. The ovary grows rapidly and ripens to form a fruit.

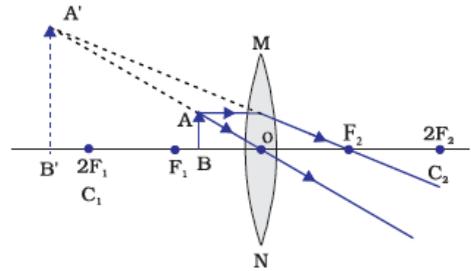
14. Classification of species is a reflection of their evolutionary relationship. Evolution is the progress of species from generation to generation and classifications the grouping of species or organisms on the basis of properties they inherited.

15. When a tall plant was crossed with a short plant, the first(F<sub>1</sub>) generation plants were all tall.

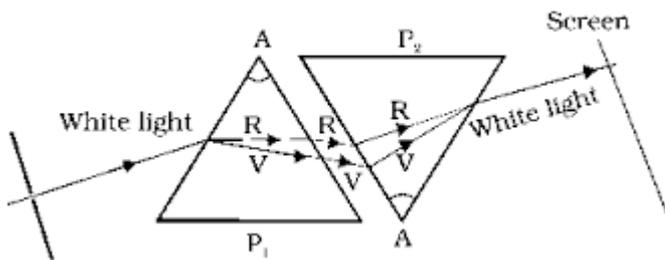
But when the F<sub>1</sub> generation plants were crossed, the second (F<sub>2</sub>) generation plants were not all tall, there were both tall and short plants. Tall : short = 3 : 1

This shows that the F<sub>1</sub> plants inherited their trait from the short plants but did not express it in the presence of the tallness, and had transferred it to the next generation.

16.  $m = -v/u = -1 \Rightarrow v = u = 60/2 = 30$   
 $1/f = 1/v + 1/u = 2 \times 1/30 = 1/15 \Rightarrow f = 15\text{cm}$   
 New object distance =  $u = -(30 - 20) = -10\text{ cm}$   
 hat is between O and F  
 $\Rightarrow 1/15 = 1/v + 1/-10$   
 $\Rightarrow 1/15 - 1/10$   
 $= 1/v = (10-15)/150 = 1/-30$   
 $\Rightarrow$  image will form at  $2f_1$



17. At the first to we use a glass prism to obtain the spectrum of sunlight. Now placed a second identical prism in an inverted position with respect to the first prism in such a way that all the colours of the spectrum to pass through the second prism. All the colour recombine into one white colour.



18. a. Conservation of environment is required for preventing damage to environment and depletion of natural resources.

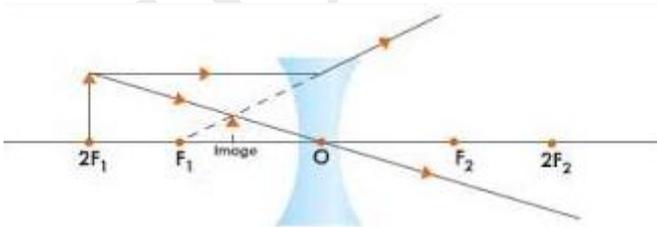
- b. A green dust bin used to store biodegradable waste and blue dust bin used to store recyclable waste
- c. environment conscious and scientific temperament

19. a. Rays of light parallel to the principal axis are falling on a convex lens, after refraction from the lens, meet or appear to meet to a point on the principal axis. This point on the principal axis is called the principal focus of the lens.

b.  $f = -30\text{ cm}$  (concave lens),  $H_o = 5\text{ cm}$ ,  $v = -15\text{ cm}$

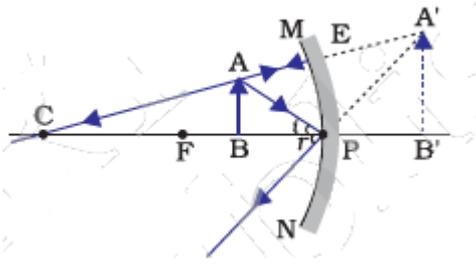
$$1/u = 1/v - 1/f = 1/-15 - 1/-30 = -1/30 \Rightarrow u = -30\text{ cm}$$

$$H_i = v/u \times H_o = -15/-30 \times 5 = 2.5\text{ cm}$$

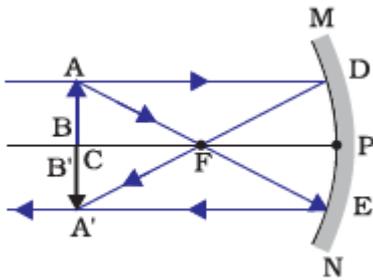


20. Concave mirror, focal length =  $-12\text{ cm}$

- (i) less than  $12\text{ cm}$  (b/w  $f$  and  $O$ )
- (ii) larger than object

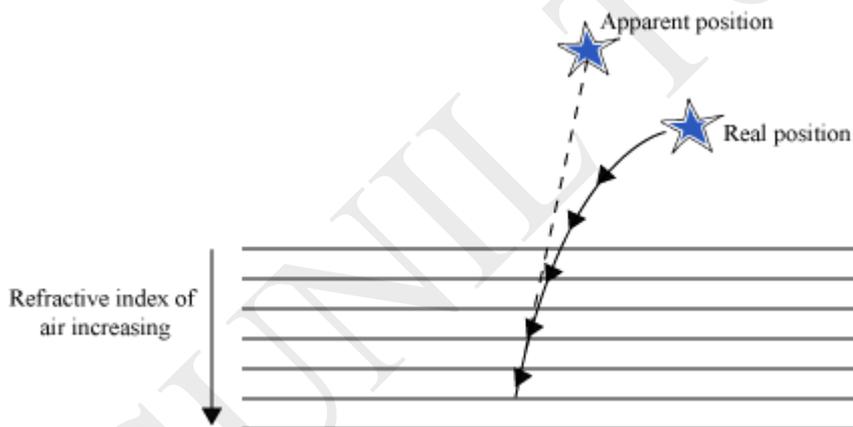


(ii) At centre of curvature



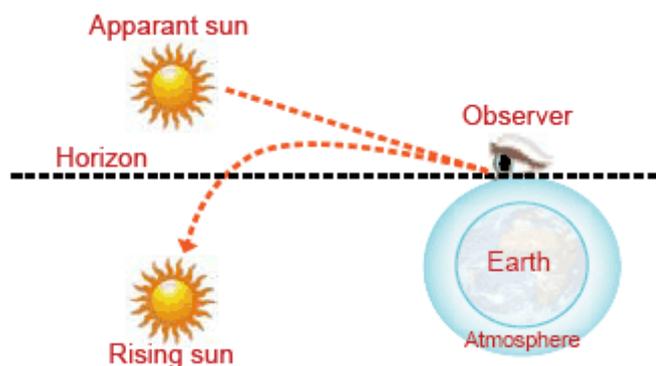
21. Atmospheric refraction refers to the refraction of light by the earth's atmosphere due to difference in refractive indices of the different layers of air.

a. stars are twinkling due to atmospheric refraction of star light. The star light, on entering the earth's atmosphere, undergoes refraction continuously before it reaches the earth due to gradual change in refractive index. This forms apparent position and stars twinkle.



b. In the sunrise, the light from the Sun gets refracted by the atmospheric layers and reaches the observer by making apparent position positions of the Sun with respect to the horizon even though it is below the horizon. It takes about 2 min to cross the horizon. Thus the Sun is visible to us about 2 minutes before the actual sunrise.

The sun sets when it is below the horizon in the evening. The rays of light from the sun below the horizon reach our eyes because of refraction of light. These rays appear to come from the apparent position of the sun which is about the horizon. Hence we can see the sun for a few minutes (about 2 minutes) even after it has actually set.



22 Placenta is a temporary disc shaped organ which is formed from the tissues derived from the foetus and the mother. The placenta contains villi on the embryo's side of tissue and blood spaces on the mother side of tissue. The blood space surrounds the villi. The villi provides a large surface area for glucose and oxygen to pass from the mother to the embryo. Thus, through placenta, the maternal blood passes food (glucose, amino acids, lipids and proteins), oxygen, hormones, water, antibodies to the foetal blood and the foetal metabolic wastes (carbon dioxide, urea) pass into the maternal blood.

23. Evolution is defined as a slow change in the body design and other characteristics of an organism over a long period of period that ultimately cause speciation( formation of new speciation from pre existing species).

Basis of evolution are accumulation of variations over generations. These variations arise through errors during DNA replication, mutation, recombination during sexual reproduction, etc . Geographical isolation.

The main cause of evolution are natural selection and genetic drift In natural selection. The organisms with the favourable mutations are selected by nature and provide the organism an adaptive advantage over the organisms who do not have these favourable variations. frequencies within populations can occur by chance rather than by natural selection. Random genetic drift may be an important mechanism in evolutionary change in small population.

Evolution is the sequence of gradual changes which takes place in the primitive organisms over millions of years in which new species are produced.

24. We are given that the compound Y on addition of one mole of H in the presence of Ni forms another compound. This suggests that the compound Y is unsaturated. Since the compound Y is formed by dehydration of compound X by using H an alcohol. Compound Z will be alkane (alkenes on hydrogenation give alkanes). As compound Z gives two molecules of CO molecules of H O, it means that it is an alkane containing two carbon atoms. Thus Compound X = CH OH Compound Y = CH =CH Compound Z = CH -CH

P = Etanol    Q = Ethene    R = Etane

