TN Board SSLC (Class 10) Science 2018 Question Paper with Solutions

PART-III

Section-I   **15X1=15**

1. **The correct statement about Neanderthal man is:**
    (the first human like hominid, started agriculture, ate meat and walked erectly, buried the dead)

    Answer: the first human like hominid and buried the dead

2. **_____ is a viral disease**
    (Typhoid, Leprosy, Rabies, Ringworm)

    Answer: Rabies

3. **An endocrine gland found in the neck is_____**
    (adrenal gland, pituitary gland, thyroid gland, pancreas)

    Answer: thyroid gland

4. **In sexual reproduction of flowering plants, the first event involved is_____**
    (fertilisation, germination, regeneration, pollination)

    Answer: pollination

5. **Sensitive whiskers are found in_____**
    (Bat, Elephant, Deer and Cat)

    Answer: Cat

6. **Nephridia are the excretory organ of _____**
    (Protozoans, Coelenterates, Flatworms, Annelids)

    Answer: Annelids

7. **An example of water-borne disease is _____**
    (scabies, dracunculiasis, trachoma, cholera)

    Answer: dracunculiasis and cholera

8. **A solution that contains water as the solvent is called an aqueous solution. If carbon-di-sulphide is a solvent in a given solution, then the solution is called _____**
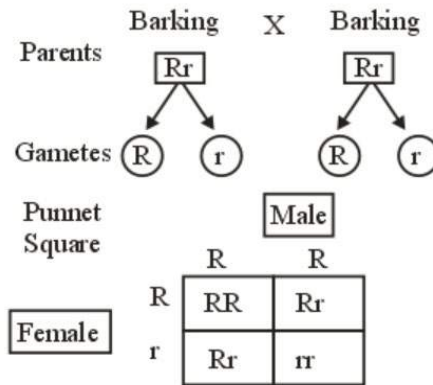   **(aqueous solution, non-aqueous solution)**

    Answer: non-aqueous solution

9.   **Citric acid is present in lemon. Apple contains_____**
              (Lactic acid, Malic acid, Tartaric acid, oxalic acid)

              Answer: Malic acid

10.   **Group 16 Elements are called _____**
              (Carbon family, Chalcogen family, Halogen family, Nitrogen family)

              Answer: Chalcogen

11.   **The IUPAC name of the first member of alkyne is_____**
              (ethene / ethyne)

              Answer: ethyne

12.   **The Screw Gauge is used to measure the diameter of _____**
              (Crowbar, Thin wire, Cricket ball)

              Answer: Thin wire

13.   **If the radius of the earth is reduced to half·its present value,with no change in the mass, the acceleration due to gravity will be _____**
              (double that of its original value, four times that of its original value, remains same, reduced to half of its original value)

              Answer: four times that of its original value

14.   **30 bulbs are connected in series. If one bulb is fused and the remaining 29 bulbs are connected in series and connected to the same supply, the light in the room will be _____**
              (increased, decreased, remain the same)

              Answer: increased

15.   **An electric current passing through a metallic conductor produces a_____ around it**

              (magnetic field, mechanical force, induced current)

              Answer: magnetic field

        Section-II   **20X2= 40**

16.   **In dogs the barking trait is dominant over the silent trait. Using Punnet Square work out the possible puppies born to two barking parents with genotype(Rr)**

              Answer:

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          Barking    X    Barking
Parents    Rr              Rr

Gametes   (R)  (r)        (R)  (r)

Punnet                    Male
Square           R     R

          R    RR     Rr
Female
          r    Rr     rr
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RR- Barking
Rr- Barking
rr -Silent

Phenotypic ratio here is Barking: Silent = 3: 1 , while Genotypic ratio is RR: Rr: rr = 1:2:1

17. Who proposed the theory of Natural Selection? Mention the two principles of this theory.

Answer: Charles Darwin the great naturalist and philosopher of 18th century developed the theory of Natural Selection. He published his observations and conclusions under the name 'Origin of species' in 1859. The book of Darwin demonstrates the fact of evolution and elaborates on the theory of Natural selection for evolutionary transformation.

Meanwhile, two principles of the theory are given below:

i. Overproduction- Living beings have the ability to reproduce more individuals and form their own progeny. They have the capacity to multiply in a geometrical manner. This will increase reproductive potential leading to overproduction.

ii. Variations- a characteristic feature of all plants and animals. Small variations are important for evolution. According to Darwin, favourable variations are useful to the organism and unfavourable variations are harmful or useless to the organism.

18. What are monoclonal anti-bodies. Mention its use?

Answer: Monoclonal antibodies (mAb or moAb) are laboratory produced molecules that are made by identical immune cells and serve as substitute antibodies that can restore, enhance and mimic the immune system's attack on the cancer cells. Monoclonal antibodies can be used to detect antigens in fixed tissue sections, and they are also good possible treatment for cancer.

19. Assertion (A)- Expulsion of excess unused glucose in the blood through urine is observed in a diabetic mellitus person.
Reason (R)- Insulin is not produced in sufficient quantity by pancreas.
(a) Both (A) and (R) are true and (R) explains (A)
(b) Both (A) and (R) are true but (R) doesn't explain (A)

(c) Only (A) is true but (R) is false

(d) (A) is false but (R) is true

Answer: (c) Only (A) is true but (R) is false

20.

**Copy and identify the types of neurons given below:**


a.

b.

Answer: (a)Unipolar nucleus- Only one nerve process arises from the cyton, which acts as both axon and dendron. They are found in early embryos but not in adult.

(b) **Multipolar Neurons**- The cyton gives rise to many dendrons and an axon. They are found in cerebral cortex of brain.

21. Draw the given diagram and label the parts.

Answer:

(a) Lateral view of a seed   (b) A mature embryo with its parts
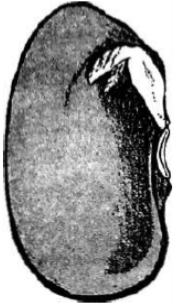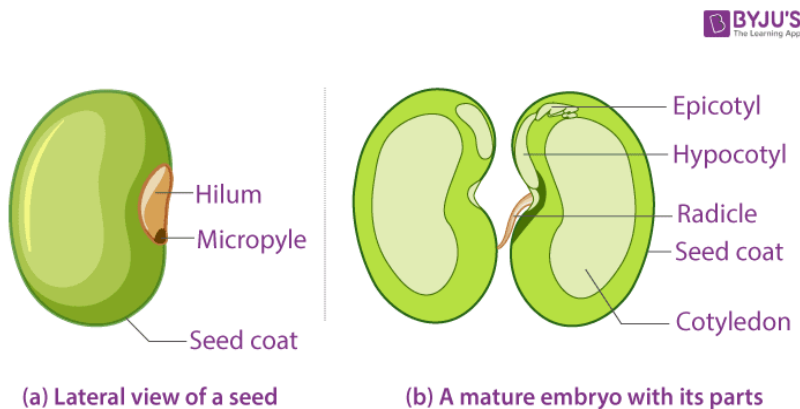
22. Mention two unique characteristics of mammals

> **Answer:** Mammals are warm-blooded animals who give birth to their younger ones. They also have mammary glands that help them produce milk to feed their younger ones. Learn more about the characteristics of mammals from here.

23. (a) What are the structural and functional units of a kidney?
(b) Arrange the organs of the human excretory system in the correct order, based on
the passage of urine.
ureter, urethra, kidney, urinary bladder

Answer: (a) Nephrons are the structural and functional unit of the Kidney. Each kidney contains about 12 million nephrons. Learn more about the structural and functional unit of kidney from here.
(b) The organs of the human excretory system arranged in the correct order, based on the passage of urine is Kidney →Ureter →Urinary Bladder → Urethra.

24. (a) What type of dentition is seen in Mammals?
(b) What are modified as tusks in Elephants?

Answer: (a) The existence of two sets of teeth in the life of an animal such as the milk teeth (young ones) and permanent teeth (in adults) is called diphyodont dentition. Meanwhile, Mammals have different type of teeth. There are four kinds of teeth in mammals viz. the incisors (I), canines (C), premolars (PM) and molars (M). Hence, the dentition found in mammals are either thecodent or heterodont.

(b) In mammals, actually, the enlarged and elongated canine teeth are the tusks. In the case of Elephants, their large incisors are modified as tusks.

25. Sugar is converted into alcohol
a.   In the above reaction, which kind of process takes place?
b.   Which micro-organism is involved in the above reaction?

Answer: (a) When sugar is converted into alcohol, the fermentation process takes place. During the process of alcoholic fermentation, the glucose is converted into pyruvic acid, which is then transformed and the ethanol and carbon dioxide is formed.
(b) Yeast the single-celled fungi which can perform anaerobic, alcoholic fermentation is involved in the given reaction. They are used for the production of alcohol on a commercial scale.

26. A fish taken out of water cannot survive for a long time. Why?

Answer: Fish use the gills to breathe, instead of lungs. These, gills can function only in water. When the water passes through the fish's gills, it absorbs oxygen from the water and replaces it with carbon dioxide from the fish's bloodstream. The water flows out under the gill's cover and this process is repeated. Now, if the fish is taken out of water, the gills will not be able to function and the fish would stop breathing. Hence, the fish cannot survive for a long time, if taken out of water.

27. Types of vascular tissues are given, which are labelled as A and B
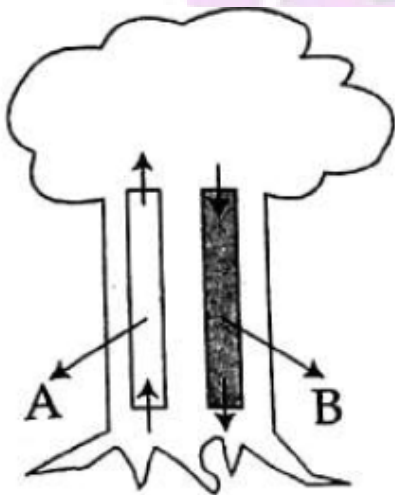
a.   Name A and B
b.   How do the materials in A move upwards to the leaves?

Answer: (a) Here, in the picture for vascular tissues. A is the Xylem and B the Phloem.

(b) Xylem transports water and mineral salts from the roots up to other parts of the plant. This is the result of the evaporation from mesophyll cells in the leaves that produces a negative water potential gradient. Meanwhile, transpiration pull is the force, which aids in drawing the water upward from roots to leaves.

28. Observe the following bio-geo chemical cycle.
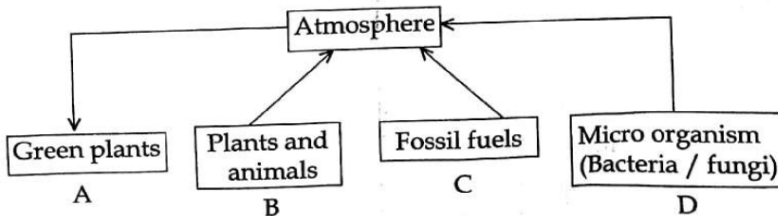
a.   **Mention the nutrient in the given cycle?**
b.   **Write the activities from "A" to "D".**

     Answer: (a) Carbon is the nutrient in the given cycle
 (b) The activities from A to D include Photosynthesis, respiration, combustion and decomposition. Carbon dioxide in the atmosphere is taken up by the green plants and other photosynthetic organisms and is converted into organic molecules that travel through the food chain. Carbon atoms are then released as carbon dioxide when organisms respire. The formation of fossil fuels and sedimentary rocks contribute to the carbon cycle for very long periods.

29. What is energy management?

Answer: Energy management can be defined as a planned and organised management of energy use in a building or an organisation, to satisfy both the economic and the environmental requirements. Meanwhile, when it comes to energy saving, energy management is also the process of monitoring, controlling and conserving energy.

30. Correct the statements, if they are wrong:
a.   **India is called the 'country of winds'**
b.   **Propane is the chief component of natural gas**

Answer: (a) Statement is correct
(b) Statement is wrong. Methane is the chief component of natural gas.

31. Match the renewable and non-renewable sources

Sources	A	B	C
Renewable	Coal	Wind	Petroleum
Non-renewable	Hydrogen	Natural Gas	Solar Energy

Answer:

Sources	A	B	C
Renewable	Coal	Natural Gas	Solar Energy
Non-renewable	Hydrogen	Wind	Petroleum

32. Take 30gm of common salt and dissolve it in 70gm of water. Find the concentration of solution in terms of weight percent.

Answer: Mass of solute (salt) = 30g
Mass of solvent (water) = 70g
Now, Mass of solution = Mass of solute + Mass of solvent = 30g + 70g = 100g
Meanwhile, concentration of solution = (mass of solute / mass of solution) ×100 = (30/100)×100=30%

33. Radha prepared a solution, which could be separated by filtration.
> **(a) Name the type of solution.**
> **(b) Is the solution transparent or opaque?**
> **(c) Mention the nature of the solution.**
> **(d) Mention the size of the solute particle.**

Answer: (a) Suspension solution is the solution that can be separated by filtration
(b) Since the solute particles are insoluble in the solvent and remain suspended in the solution, we cannot see through them. Hence, the solution is opaque.
(c) Suspension solutions are heterogeneous mixtures and the solute particles are not uniformly distributed in the solvent.
(d) The suspension solutions have the biggest particles of the size greater than 2000Å, while true solutions have the least particle size followed by colloidal solution particles.

34. Complete the table given below:

Element	Atomic mass	Molecular mass	Atomicity Number
Chlorine	**35.5**	**71**	**_____**
Ozone	**_____**	**48**	**3**
Sulphur	**32**	**_____**	**8**
Nitrogen	**14**	**_____**	**2**

Answer:

Element	Atomic mass	Molecular mass	Atomicity Number
Chlorine	35.5	71	2
Ozone	16	48	3
Sulphur	32	256	8
Nitrogen	14	28	2

35. If acetic and hydrochloric acid of same concentration are taken, which among the two is a stronger acid and why?

Answer: Acid that completely dissociates in water is the stronger acid. Hydrochloric acid is a stronger acid, which completely ionises in an aqueous solution.

36. The pH values of certain familiar substances are given below:

Substance	pH Value
Lemon Juice	2.2-2.4
Tomato Juice	4.1
Coffee	4.4-5.5
Household Ammonia	12.0

Analyse the data given in the table and answer the following questions:
a.   Which substances are acidic in nature?
b.   Which substances are basic in nature?

Answer: pH scale is for measuring the hydrogen ion concentration in a solution. Acids have pH less than 7, while Bases have pH greater than 7.
a.   Lemon Juice, Tomato Juice and Coffee are all substances that are acidic in nature
b.   Household Ammonia is basic in nature

37. Match the following:

Ore	Formula
(a)Bauxite	Fe_2O_3
(b)Cuprite	Cu_2O
(c)Haematite	$CuFeS_2$

(d)Copper pyrites	$Al_2O_3.\ 2H_2O$

Answer:

Ore	Formula
(a)Bauxite	$Al_2O_3.\ 2H_2O$
(b)Cuprite	Cu_2O
(c)Haematite	Fe_2O_3
(d)Copper pyrites	$CuFeS_2$

38. Assertion: In thermite welding aluminium powder and Fe_2O_3 are used.
Reason: Aluminium powder is a stronger reducing agent. Does the reason satisfy the assertion?

Answer: Yes, thermite welding is a combination of aluminium powder and Fe_2O_3 Aluminium powder is used as it is a strong reducing agent. Thus, we can conclude that the reason does satisfy the assertion.

39. Read each description below and say whether it fits ethanol or ethanoic acid.
a. It is a clear liquid with burning taste
b. It is used to preserve biological specimens in laboratories
c. It is used to preserve food and fruit juices
d. On cooling, it is frozen to form ice-flakes, which look like a glacier

Answer: (a) Ethanol is a clear liquid with burning taste
(b) Ethanol is used to preserve biological specimens in laboratories
(c) Ethanoic acid is used to preserve food and fruit juices
(d) On cooling, Ethanoic acid is frozen to form ice-flakes, which look like a glacier

40. Why does a spanner have a long handle?

Answer: Spanner has a long handle, because it facilitates an increased torque with just a small application of force. So, in order to do the desired function only less force needs to be used.

41. If an angel visits an asteroid called B 612, which has a radius of 20 m and mass of 104 kg, what will be the acceleration due to gravity in B 612 ?

Answer: Given that the formula of acceleration due to gravity is given by, $g = GM/R^2$
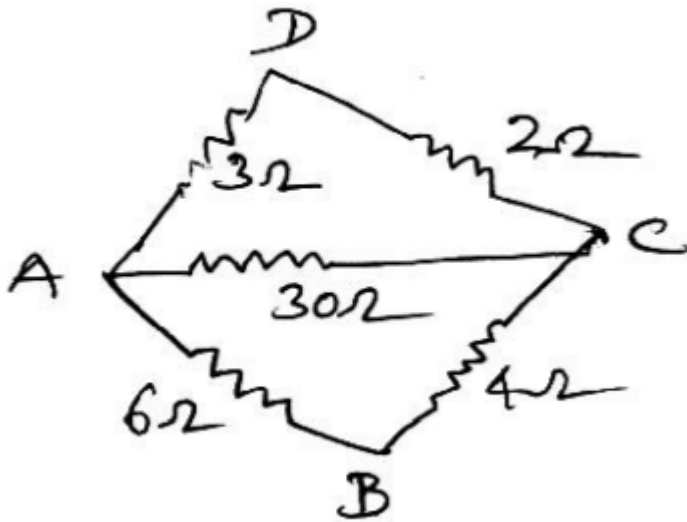G - Universal Constant - 6.67×10^{-11} Nm²/kg²
M - Mass of asteroid = 104 kg
R - Radius of Asteroid - 20 m
acceleration due to gravity in Asteroid B 612 = $6.67 \times 10^{-11} \times$ 104 / (20)² = 1.7342 10^{-11} m/s²

42. Find the effective resistance across the end AC

Answer: R1+ R2 = 3 + 2 = 5 Ohm
Also, R4+ R5= 6+ 4= 10 Ohm
Meanwhile, R3= 30 Ohm

Now, all these are in parallel. Hence, 1 / RP = 1/5 +1/10 + 1/30
$1/R_P = (6+3+1) / 30 = 10/ 30 = 1/3$
Therefore, R_P= 3 Ohm.

**43. Complete the table choosing the right terms within the brackets
(Zinc, Copper, Carbon, Lead, Lead Dioxide, Aluminium)**

+ve electrode	Lead Acid Accumulator	
-ve electrode	Lechlanche	

Answer:

+ve electrode	Lead Acid Accumulator	Lead dioxide
-ve electrode	Lechlanche	Zinc

44. Match the following:

(a)Charge (Q)	I² X R X t

(b)Work done(W)	I X t
(c)Heat Energy(H)	R X I
(d) Potential Difference(V)	V X Q

Answer:

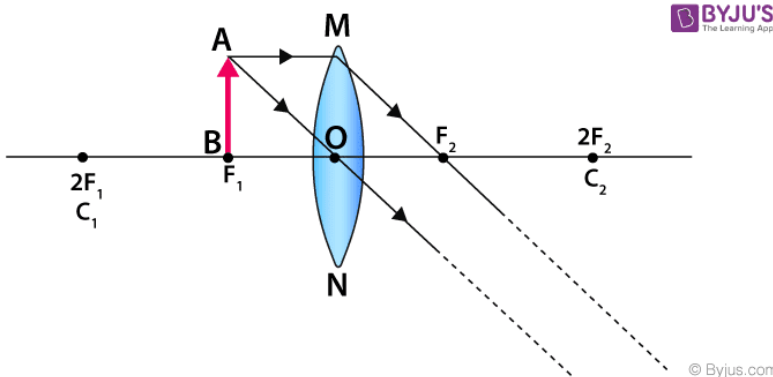| (a)Charge (Q) | I X t |
(b)Work done(W)	V X Q
(c)Heat Energy(H)	I^2 X R X t
(d) Potential Difference(V)	R X I

45. Fill in the blanks:
a.   Motor : A Permanent magnet ; then Commercial magnet : _____
b.   Focal length of a lens : metre ; Power of a lens : _____

Answer: (a) electromagnets
(b) dioptre($^{-m}$)

46. If an object is placed at the principal focus, F_1 of a convex lens, draw the ray diagram for the image formation.

Answer:

47. Light enters from air to kerosene having refractive index of 1.47. What is the speed of light in kerosene, if the speed of light in air is 3 X 10^8 m/s?

Answer: Refractive index = Speed of light in air / speed of light in kerosene

1.47 = 3×10^8/ Speed of light in kerosene

Therefore, Speed of light in kerosene = 3×10^8/ 1.47 = 2.04×10^8 m/s.

Section-III   **4 X 5=20**

Part-I

48. (a) How is Tuberculosis transmitted?
(b) How does Tuberculosis affect our body?
(c) What is the causative agent of Tuberculosis?
(d) How can it be prevented? (any three)

Answer: (a) Tuberculosis is transmitted by bacteria and like the ordinary cough and cold, this can also spread through the air. When someone who has it coughs or sneezes or laughs, tiny droplets that contain the germs are released into the air. And if someone breathes in these germs, they could also get it. Hence, TB can spread from person to person.
(b) Tuberculosis can affect various parts of the body such as the lungs, kidney,spine or even brain. When TB is affected outside the lungs, the signs and symptoms may vary, according to the organ infected.
(c) Humans are affected by the Mycobacterium tuberculosis, while another species Mycobacterium Bovis, affects the animals. Mostly, all infections are airborne and are caused due to inhalation of the droplet nuclei.
(d) Suggestions or precautions to follow in order to prevent tuberculosis are given below:
- Visit the doctor regularly and Take the medicines are prescribed
- Wash hand immediately after coughing or sneezing
- Lead a healthy lifestyle by following a healthy diet and maintaining personal hygiene
- Stay at home and ventilate the room

49. List out the various parts of the human brain and write notes on the functions.

Answer: Major parts of the human brain includes the Forebrain, Midbrain and the Hindbrain. Check out the various parts of the human brain and their functions from here.

Part-II

50. Write the two events involved in the sexual reproduction of a flowering plant.
a.   Discuss the first event and explain its types
b.   Mention the advantages and disadvantages of the event.

Answer: (a)The two events involved in the sexual reproduction of a flowering plant are (i) pollination and (ii) fertilisation.
(a) First event that occurs is Pollination. There are of two kinds, self-pollination and cross-pollination. Now learn here about the types of pollination and their advantages and disadvantages.

51. We are surrounded by smoke. Is this situation good for our health? Give reason.

Answer: No the situation is not good for our health. Reason for this are given below:
- If the smoke is above a certain level in the then it can cause allergy and irritation to the eyes.
- This could also lead to respiratory infection such as bronchitis or pneumonia

- If you inhale the air containing pollutants from the smoke, it could be harmful for the body
- Smoke also causes lung cancer or heart disease and so on
- Smoke could result in difficulty in breathing, asthma, wheezing etc.

Part-III

52. Find how many moles of atoms are there in:
a.   **7 g of Nitrogen**
b.   **4.6 g of Sodium**
c.   **40 g of Calcium**
d.   **14 g of Lithium**
e.   **3.2 g of Sulphur**

Answer: (a) 1gm Mole of Nitrogen is 28 g. Therefore, 7g of Nitrogen=7/28gm-mole or 0.25gm-mole.
As per Avogardo's Law, the number of atoms in 1 mole of any substance= 6×10^{23}
Therefore,no.of atoms in 7 g = $6 \times 0.25 \times 10^{23}$
(b) 1 gm Mole of Sodium is 23 g. Therefore, 4.6 g of Sodium = 4.6/23 gm-mole or 0.2 gm-mole.
As per Avogardo's Law, the number of atoms in 1 mole of any substance= 6×10^{23}
Hence, the no. of atoms in 4.6g = $6 \times 0.2 \times 10^{23}$
(c) 1gm Mole of Calcium is 40 g. Therefore, 40 g of Calcium = 40/40 gm-mole or 1 gm-mole
As per Avogardo's Law, the number of atoms in 1 mole of any substance= 6×10^{23}
Hence, no of atoms in 40 gm of Calcium is 6×10^{23}
(d) 1gm Mole of Lithium is 7g. Therefore, 14g of Lithium = 14/7gm-mole or 2gm-mole
As per Avogardo's Law, the number of atoms in 1 mole of any substance= 6×10^{23}
Therefore,no.of atoms in 7 g = $6 \times 2 \times 10^{23}$
(e) 1gm Mole of Sulphur is 32 g. Therefore, 3.2 g of Sulphur = 3.2/ 32 gm-mole or 0.1 gm-mole
As per Avogardo's Law, the number of atoms in 1 mole of any substance= 6×10^{23}
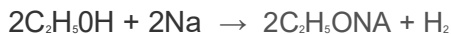Therefore,no.of atoms in 7 g = $6 \times 0.1 \times 10^{23}$

53. Organic compounds A and B are isomers with the molecular formula C_2H_6O. Compound A produce hydrogen gas with sodium metal, whereas compound 'B' does not. Compound A reacts with acetic acid in the presence of concentrated H_2SO_4 to form compound C with fruit flavour. What are the isomers A, B and the compound C? Write suitable chemical equations.

Answer: 1. Organic compound A, ethyl alcohol or ethanol is C_2H_5OH and B is dimethyl ether (CH_3-O-CH_3). These two are isomers with molecular formula C_2H_6O.
2. Ethanol reacts with the metal Sodium to form sodium ethoxide and hydrogen gas
$2C_2H_5OH + 2Na \rightarrow 2C_2H_5ONA + H_2$
3. Ethanol also reacts with ethanoic acid, and in the presence of conc. H_2SO_4, it forms ethyl ethanoate and water with fruity flavour
A- Ethyl Alcohol (Ethanol) - C_2H_5OH
B-Di methyl ether (CH_3-O-CH_3)
C- Ethyl Ethnoate ($CH_3COOC_2H_5$)

Part - IV

**54. State law of conservation of momentum and prove it.**

Answer: Law of conservation of momentum: 'In the absence of external and balanced force, the total momentum of the system of the objects remain unchanged."

55. (a) The diagram shows an object 'O', and its image 'I' formed by a lens. In the diagram, draw the lens and the rays to show how the image is formed. Mark focus F, of the lens. Name the lens.
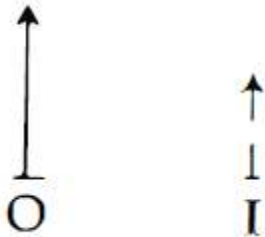
(b) Mention any two achievements of Hubble Telescope.

Answer: (a) Here, you can see that the image is erect and diminished, hence the concave lens have been used.
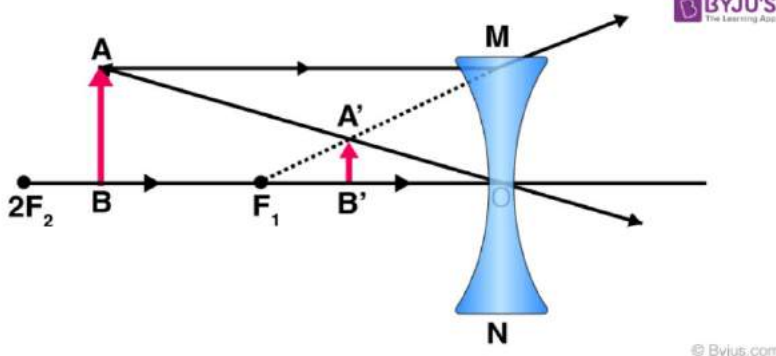
(b) Hubble telescope produces extremely sharp images with almost no background light
The ultra deep field images by Hubble are the most visible light image. These are also the most detailed image, ever made of the universe's most distant object. Hubble telescope also revealed that black holes are common to the centres of the galaxies.