TN Board Class 10 Science 2015 Question Paper with Solutions

Section-I   **15 X 1 =15**

1. **Primitive man evolved in_____**
   (Africa, America, Australia, India)

      Answer: Africa

2. **One of the means of indirect transmission of disease is_____**
   (Sneezing, Droplet from the mouth, Placenta, Utensils of patients)

      Answer: Utensils of patients

3. **If a water-soaked seed is pressed, a small drop of water comes out through____**
   (stomata, lenticel, micropyle, radicle)

      Answer: micropyle

4. **The xylem in the plants are responsible for _____**
   (transport of water, transport of food, transport of amino acids, transport of oxygen)

      Answer: transport of water

5. **What is called "black gold"?**
   (Hydrocarbons, Coal, Petroleum, Ether)

      Answer: Petroleum

6. **The mixture of gases used by deep-sea divers is_____**
   (Helium-Oxygen, Oxygen-Nitrogen)

      Answer: Helium-Oxygen

7. **Vinegar is present in acetic acid' Curd contains '_____ acid'**
   (Lactic acid/Tartaric acid)

      Answer: Lactic

8. **Any metal mixed with mercury is called amalgam. The amalgam used for dental filling**
   is_____
   (Ag-Sn amalgam, Cu-Sn amalgam, Ag-Au amalgam)

      Answer: Ag-Sn amalgam

9. **Number of periods in the Modern periodic table is_____**
   (7, 17, 8, 18)

Answer: 7

10. **Even though it is a non-metal, graphite conducts electricity. It is due to the presence of_____**
(free electrons/bonded electrons)

Answer: free electrons

11. **The freezing of biotechnology products like vaccines requires_____ freezing systems.**
(Helium, Nitrogen, Ammonia, Chlorine)

Answer: Nitrogen

12. **The potential difference required to pass a current of 0.2 A in a wire of resistance 20 ohms is _____**
(100V, 4V,0.01V, 40v)
Answer: 4V

13. **Kilowatt-hour is the unit of _____**
(potential difference, electric power, electric energy, charge)

Answer: electric energy

14. **An electric current through a metallic conductor produces_____ around it.**
(heat, light, magnetic field, mechanical force)

Answer: magnetic field

15. **The defect myopia can be corrected by using a____**
(Convex lens, Concave lens, Concave mirror, Convex mirror)

Answer: Concave lens

Section-II   20 X 2 =40

16. **Identical twins are syngenetic with similar chromosomal contents. Natural clones are those who possess identical chromosomes.**

Fill up with the suitable word given in the brackets.

(a) Identical twins are_____
(natural clones/identical clones)

(b) Identical twins are_____
(dissimilar to each other/similar to each other)

Answer: (a) natural clones
(b) Similar to each other

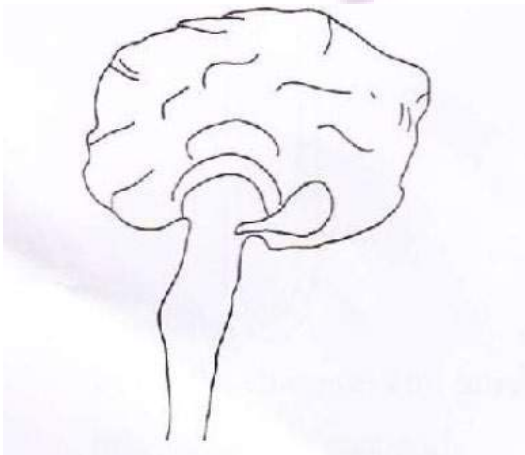17. **Match the following vitamins with their deficiency diseases.**

VITAMINS	DEFICIENCY DISEASES
(I) vitamin A	Beri Beri
(II) Vitamin B_1	Scurvy
(III) vitamin C	Rickets
(IV) vitamin D	Nyctalopia

Answer:

VITAMINS	DEFICIENCY DISEASES
(I) vitamin A	Nyctalopia
(II) Vitamin B_1	Beri Beri
(III) vitamin C	Scurvy
(IV) vitamin D	Rickets

18. **This diagram is of a human brain, and the functions of different parts are given below. Mark A and B in the parts of the brain corresponding with the function.**
   **(A) Seat of smell**
   (B) Seat of vision

Answer:

HUMAN BRAIN

1 Parietal Lobe | 2 Occipital Lobe | 3 Cerebellum
4 Spinal Cord | 5 Temporal Lobe | 6 Friontal Lobe
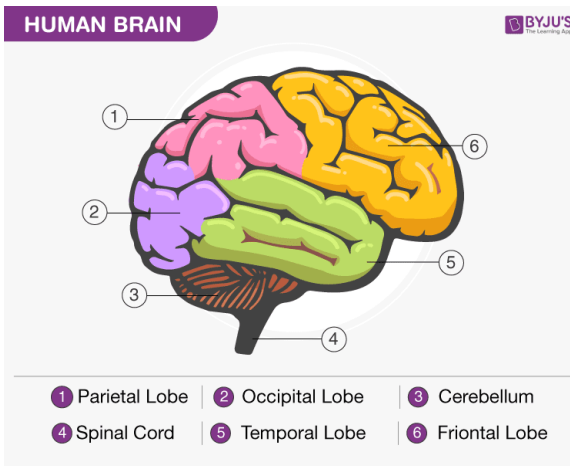
19. **Based on relationship fill in the blanks'-**
 Thyroxin: Personality hormone
 Adrenalin:

 Answer: emergency hormone

20. **Correct the statements if they are wrong.**
a. **Alpha cells produce insulin, and beta cells produce glucagon.**
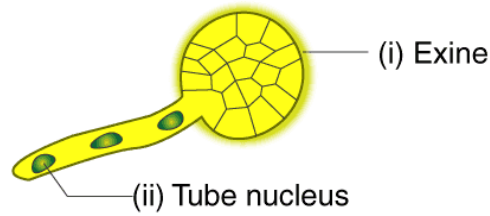b. **The ovary produces eggs and Androgen.**

 Answer: (a) Wrong. Alpha cells produce the hormone glucagon while beta cells produce insulin
 (b) Wrong. Androgen is the male hormone and normally ovary produces only eggs

 21.
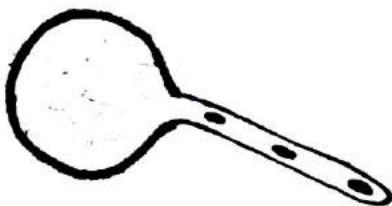
 Redraw the diagram and label the following parts :
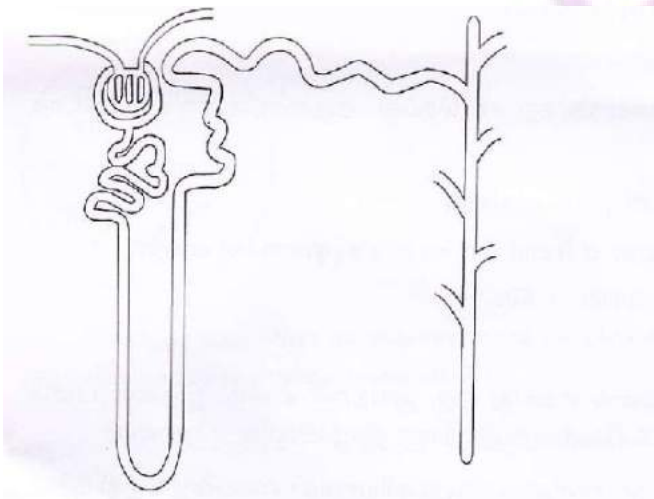 **(a) Exine**
 (b) Tube nucleus

 Answer:

(i) Exine

(ii) Tube nucleus

22. **Based on relationship, fill up :**
Whale : Baleen plates
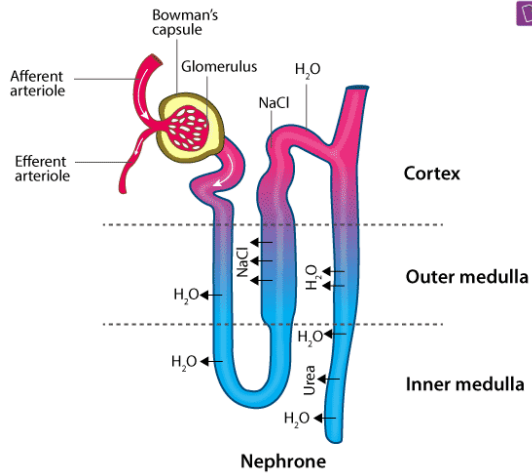**Bats: _____**

Answer: Wings

23. Draw the diagram and label any two parts mentioned below :
(a) Bowman's capsule
(b) Glomerulus
(c) Loop of Henle
(d) Collecting duct

Answer:

Nephrone

24. Fill in the blanks.

a.   **Plasma : Fibrinogen ; RBC :_____**

b.   **WBC: _____**

          Answer: (a) haemoglobin
           (b) antibodies

25. Pick the odd one out.
The parts of the alimentary canal are_____
(Pharynx, Mouth, Buccal cavity, Pancreas)

          Answer: Pancreas is the odd one out, as the other 3 are part of the alimentary canal.

26. Study the food chain below, correct it and convert it into a pyramid of energy.
Mulberry → Sparrow → Caterpillar → Kite

     Answer: Mulberry → Caterpillar → Sparrow → Kite

Mulberry is the plant, so it is autotrophic. The caterpillar is the primary consumer and feeds on the mulberry. Sparrow is the secondary consumer and feeds the caterpillar. Finally, Kite is the tertiary consumer that feeds on the sparrow.

KITE

SPARROW

CATERPILLAR

MULBERRY

27. A non-renewable resource is a natural resource if it is replaced by a natural process, at a rate of consumption by a human. Read this statement and confirm whether it is correct or incorrect. If it is incorrect, give the correct statement.

Answer: Statement is not valid. A non-renewable resource cannot be replaced via natural process.

28. The pie diagram represents survey results of infectious diseases of a village during 2008-2009. Analyse it and answer the following questions.

a.   Which diseases affect the majority of the population?
b.   How are these diseases transmitted?

Answer: (a) From the pie diagram, it is evident that the majority of the population get dengue fever and chikungunya.
(b) Chikungunya and Dengue fever are transmitted via Aedes aegypti and Aedes albopictus mosquitoes.

29. Pick out the suitable appliances to conserve electrical energy.
[Fluorescent bulbs, Copper choke, Solar Water Heater, Electric Water Heater, Tungsten bulbs, Electronic choke]

Answer: The most suitable appliance to conserve electrical energy is the Solar Water Heater.

30. Distinguish between the true solution and a colloidal solution.

Answer: True solution is a homogenous mixture, while the colloidal solution is a heterogeneous mixture of two or more substances. Meanwhile, a true solution is also transparent, while the colloidal solution is translucent. An example of a true solution is sugar solution in water and starch dissolved in water is the example of a colloidal solution.

31. Find the concentration of a solution in weight per cent, if 20gm of common salt is dissolved in 50 grams of water.

Answer: Given that Mass (Solute) = 20gm and Mass (Solvent) = 50gm
Calculate Mass of Solution = Mass of Solute + Mass of Solvent = 20 gm + 50 gm = 70gm
Hence, Mass % Solution = [Mass (solute)/Mass (solution)] × 100 = 20 / 70 × 100 = 28.57%

32. $_{18}Ar^{40}$, $_{17}Cl^{35}$, $_{20}Ca^{40}$, $_{17}Cl^{37}$
From the given examples form the pair of Isotopes and the pair of Isobars.

Answer: Isotopes has the same atomic number but a different mass number, whereas isobars have a different atomic number but the same mass number. Hence, the isotopes from here are $_{17}Cl^{35}$ and $_{17}Cl^{37}$, while the Isobars are $_{20}Ca^{40}$ and $_{18}Ar^{40}$.

33. What type of chemical reaction takes place when:
a.   Limestone is heated
b.   A magnesium ribbon is burnt in air

Answer: (a) When limestone is heated decomposition reaction takes place
$CaCO_3(s)$ → $CaO(S) + CO_2$
(Limestone)   (Quicklime)

(b) When a magnesium ribbon is burnt in air, combination reaction takes place
$2Mg(s) + O_2(g)$ → $2MgO(s)$

34. **Match the following:**

Source	Acid Present
Apple	Oxalic Acid
Lemon	Tartaric Acid
Grape	Malic Acid
Tomato	Citric Acid

Answer:

Source	Acid Present

Apple	Malic Acid
Lemon	Citric Acid
Grape	Tartaric Acid
Tomato	Oxalic Acid

35. Iron reacts with conc. HCl and conc. H_2SO_4. However, it does not react with conc. HNO_3. Suggest an answer with proper reason.

Answer: Conc.HNO_3 is a potent oxidising agent, and so it converts the iron to ferric oxide(Fe_2O_3) and forms a protective coating around it. However, as the metal loses contact with the acid soon, the reaction is stopped, and chemically active metal stops reacting.

36. Write any two uses of aluminium.

Answer: Some uses of aluminium are given:
- Aluminium is widely used in the packaging industry for the production of coils, cans, foils, and other wrapping materials.
- It is also a component of many commonly used items such as utensils and watches.
- In construction industries, aluminium is employed in the manufacture of doors, windows, wires, and roofing

37. Match the following compounds with their functional groups.

COMPOUNDS	FUNCTIONAL GROUPS
Alcohol	> C=O
Aldehyde	-OH
Ketone	-COOH
Carboxylic Acid	-CHO

Answer:

COMPOUNDS	FUNCTIONAL GROUPS
Alcohol	-OH
Aldehyde	-CHO
Ketone	> C=O
Carboxylic Acid	-COOH

38. Fill in the blanks

a.   **Force = mass X acceleration, then momentum =_____**
b.   **Liquid hydrogen is for rocket, then _____ is for MRI**

> **Answer:** (a) Momentum is defined as the product of the mass of the body and its velocity. Hence, momentum = mass X velocity.
> (b) Liquid helium is for MRI

39. From the following statements write down the one, which does not apply to the mass of an object

a.   **It is a fundamental quantity**
b.   **It is measured using physical balance**
c.   **It is measured using a spring balance**

> **Answer:**(c) It is measured using a spring balance. Spring balance is used to measure the weight of the substance. Meanwhile, weight is defined as the force experienced by the object due to earth's gravity. Mass is defined as the total amount of matter contained in an object.

40. Calculate the energy produced when I kg of substance is fully converted into energy. (Note: C=3 X 10^8ms^{-1})

> **Answer:** Use the formula Energy, $E=mc^2$, where mass (m) is 1 kg.
> Speed of light, C = 3 X 10^8ms^{-1}
> Hence, E = 1 X (3 X 10^8) ^{2} = 9 X 10^{16}J

41. Correct the mistakes, if any, in the following statements:

a.   **A good source of energy would be one which does a small amount of work per unit volume of mass.**
b.   **Any source of energy we use to do work is consumed and can be used again.**

> **Answer:** (a) This is a correct statement.
> (b) This is a wrong statement because any source of energy we use to do work is consumed and cannot be used again.

42. Draw the schematic diagram of an electric circuit consisting of a battery of two cells of 1.5V each, three resistance of 5 Ω, 10 Ω and 15 Ω, respectively and a plug key all connected in series

> **Answer:**
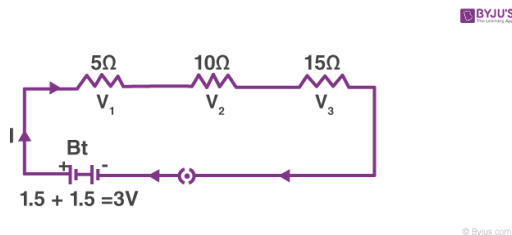
43. Correct the mistakes, if any, in the following statements

a. The magnetic field is a quantity that has magnitude only

b. The magnetic field lines emerge from the South Pole and merge at the North Pole

Answer: (a) This is an incorrect statement. The magnetic field is a quantity that has magnitude and direction.
(b) This is a correct statement.

44. From the following description, write down the names of the parts in the human eye

a. The dark, muscular diaphragm that controls the pupil.

b. The screen where the lens forms the image.

Answer: (a) The dark, muscular diaphragm that controls the pupil is the Iris
(b) Retina is the screen where the lens forms the image.
45. You know that myopia is a common refractive defect of vision. A person with this defect can see only the nearby objects, clearly. Using a concave lens of suitable power, this defect is corrected.

a. Mention any other two types of defects like this

b. Explain how we can correct it.

Answer: (a) Other two types of eye defects are hyperopia and presbyopia.
(b)Hyperopia and presbyopia can be rectified by using lenses. Hyperopia can be corrected by using converging lenses, and presbyopia can be treated with the use of simple eyeglasses with convex lenses (positive power). Contact lenses can also be used.

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

Part -I

46. What are the various applications of Biotechnology. Explain.

Answer: Learn from here the various applications of biotechnology in the field of agriculture, medicine, industry and environment.

47. There is a widespread outbreak of Malaria in your area.
a. Suggest some controlling measures to the local authorities concerned
b. Pick out the right symptom for Malaria.
(Chill and shiver and a rise in temperature, Diarrhoea)

Answer: (a) Some controlling measures against Malaria are:
- To use mosquito repellent
- Avoid stagnation of water
- Wear long sleeves
(b) Chill and shiver and temperature rise are all symptoms of Malaria.

Part -II

48. Write any two events involved in the sexual reproduction of plants.
a. **Discuss the first event and write the types.**
b. **Give the advantages and disadvantages of the event.**

Answer: (a) Pollination and fertilisation are the two events involved in the sexual reproduction of plants
(b) Also, know about the advantages and disadvantages of self-pollination and cross-pollination.

49. In your area, water is scarce, and due to this, people are affected. So, what are the measures to be taken by you to meet the scarcity of water?

Answer: Learn about water scarcity and the measures that are taken by you to meet out the scarcity of water.

Part-III

50. (a) Calculate the gram molecular mass of water from the values of the gram atomic mass of hydrogen and oxygen.
The gram atomic mass of hydrogen =1 g
The gram atomic mass of oxygen = -16 g
(b) Atoms and molecules are the building blocks of matter. List out any three differences between them.

Answer: (a) The gram molecular mass is calculated as the sum of the gram atomic masses.
The atomic mass of Hydrogen (H) = 1 and that of Oxygen (O)= 16.
Therefore, the Gram molecular mass = 2×1+16 =18g.
(b) Find here three differences between atoms and molecules:
- Atoms are Most fundamental and smallest part that can exist of an element, while two or more atoms make up the molecules.
- Atoms are the elements, while molecules make the compounds.
- An atom may not always be stable, while molecules are formed to attain stability.

51. Write the common name and the IUPAC name of the following:
a. **CH₃CH₂CHO**
b. **CH₃COCH₃**
c. **CH₃- CH - CH₃**
            |
           OH
   d. **CH₃COOH**
e. **HCHO**

Answer: (a) Common name- methyl acetaldehyde, IUPAC name- Propanol
(b) Common name- acetone, IUPAC name- Propanone
(c) Common name- Isopropanol, IUPAC name- Propane-2-Ol
(d) Common name- acetic acid, IUPAC name- Ethanoic acid
(e) Common name- formaldehyde, IUPAC name- Methanol

Part- IV

52. **(a) Explain Newton's first law of motion with example**
(b) F = Gm₁ m₂ / d₂ is the mathematical form of Newton's law of gravitation. State Newton's Law of Gravitation.

    Answer: (a) Find here an explanation for Newton's First Law of Motion with an Example.
    (b) Newton's Law of Universal Gravitation states that every particle attracts every other particle in the universe with a force that is directly proportional to the product of the masses and inversely proportional to the square of the distance between them.

53. **Draw and label the diagram given below:**
    (i) Incident Ray
    (ii) Refracted Ray
    (iii) Emergent Ray
    (iv) Angle of Refraction
    (v) Angle of deviation
    (vi) Angle of emergence
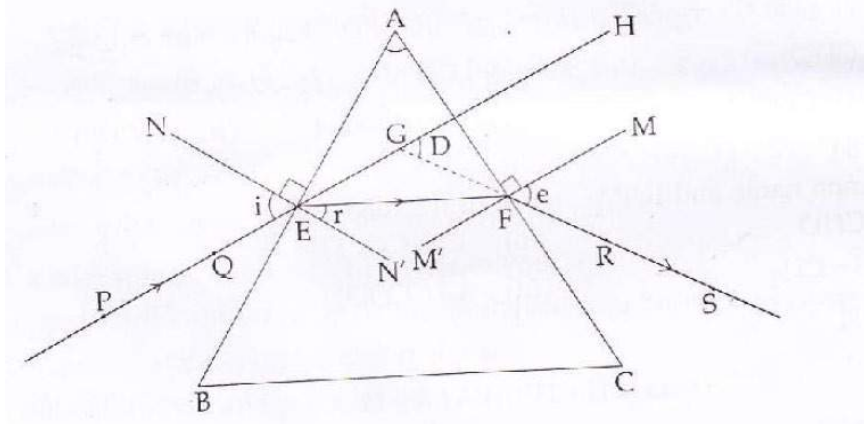
(b) The refractive index of diamond in 2.42. What is the meaning of this statement in relation to the speed of light?

    Answer: (a)

Angle of prism ∠A = 60°   **A**

H

Angle deviation = **D**

N ‥   **E**   **G**   **M**

i = Angle of incidence (i)   Refracted ray   D   (e)   Angle of emergence

(r)   (r)

Q   **R**

Incident beam   **N'**   **M'**   **S**

P   Angle of refraction   Emergent beam

B   **C**

Tracing the path of light ray through prism

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(b) Learn about the meaning of the statement the refractive index of diamond is 2.42 in relation to the speed of light.