

1. **\*\*Which part of the cell is responsible for energy production?\***

- A: Nucleus
- B: Ribosome
- C: Endoplasmic Reticulum
- D: Mitochondria

2. **\*\*Which process is involved in the water cycle?\***

- A: Precipitation
- B: Evaporation
- C: Condensation
- D: All of the above

3. **\*\*Which is a noble gas?\***

- A: Argon
- B: Nitrogen
- C: Oxygen
- D: Hydrogen

4. **\*\*Which vitamin is crucial for vision?\***

- A: Vitamin A
- B: Vitamin B
- C: Vitamin C
- D: Vitamin D

5. **\*\*Which gas is responsible for the greenhouse effect?\***

- A: Oxygen
- B: Carbon Dioxide
- C: Nitrogen
- D: Methane

6. **\*\*What is 20% of 450?\***

- A: 60
- B: 70
- C: 90
- D: 100

7. **\*\*If a product is priced at \$150 with a 25% discount, what is the sale price?\***

- A: \$115
- B: \$112.50
- C: \$120
- D: \$125

**8. \*\*The average of 7 consecutive numbers is 14. What is the smallest?\*\*\***

- A: 11
- B: 12
- C: 13
- D: 14

**9. \*\*If a car covers 180 km in 4 hours, what is the average speed?\*\*\***

- A: 45 km/h
- B: 40 km/h
- C: 50 km/h
- D: 55 km/h

**10. \*\*A number is divided by 5 and then multiplied by 3. The result is 60. What was the number?\*\*\***

- A: 90
- B: 100
- C: 80
- D: 70

**11. \*\*Which word does not belong: Chair, Table, Sofa, Book?\*\*\***

- A: Chair
- B: Table
- C: Book
- D: Sofa

**12. \*\*If all apples are fruits and some fruits are sweet, which is true?\*\*\***

- A: All apples are sweet
- B: Some apples are sweet
- C: All fruits are sweet

13. **\*\*In a sequence where each number doubles, starting from 3, what is the 4<sup>th</sup> number?\***

- A: 12
- B: 24
- C: 48
- D: 36

14. **\*\*Which letter comes next: B, E, H, K, \_\_\_?\***

- A: L
- B: N
- C: O
- D: M

15. **\*\*In a class of 40, 25 study math, 18 study chemistry, 10 study both. How many study neither?\***

- A: 5
- B: 7
- C: 10
- D: 12

16. **\*\*Which is an input device in a computer system?\***

- A: Keyboard
- B: Monitor
- C: Printer
- D: Speaker

17. **\*\*Which company developed Android?\***

- A: Apple
- B: Microsoft
- C: Google
- D: IBM

18. **\*\*Which is non-volatile memory?\***

- A: RAM
- B: ROM
- C: Cache
- D: Registers

19. **\*\*Which country hosted the 2023 G20 Summit?\***

- A: India
- B: South Africa
- C: Brazil
- D: Italy

20. **\*\*Which organization focuses on trade and economic policies?\***

- A: World Trade Organization (WTO)
- B: World Health Organization (WHO)
- C: International Monetary Fund (IMF)
- D: United Nations (UN)

- NOTE:** (i) Part-II is to be attempted on the separate Answer Book.  
(ii) Attempt ONLY FOUR questions from PART-II by selecting TWO questions from EACH SECTION. ALL questions carry EQUAL marks.  
(iii) All the parts (if any) of each Question must be attempted at one place instead of at different places.  
(iv) Write Q. No. in the Answer Book in accordance with Q. No. in the Q.Paper.  
(v) No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.  
(vi) Extra attempt of any question or any part of the question will not be considered.  
(vii) Use of Calculator is not allowed.

**(SECTION – A)**

- Q. 2.** (a) What is the Tuberculosis and Hepatitis? Explain briefly. (5)  
(b) Explain the mechanism of Fiber Optic Cable for signal. Explain its construction. (5)  
(c) Explain the difference between Middle Latitude Cyclones and Tornadoes. (5)  
(d) What is difference between the Ionic and Covalent bonding? Give examples. (5) (20)
- Q. 3.** (a) What is difference between Plastics and Elastics? Explain briefly. (5)  
(b) What is role of Remote sensing and GIS in environmental Science? Discuss briefly. (5)  
(c) What are Kepler laws related to the motion of planets? (5)  
(d) What is difference between preservatives and antioxidants? Discuss briefly with examples. (5) (20)
- Q. 4.** (a) What is role of Carbohydrates and Vitamins in the body? Discuss briefly. (5)  
(b) Discuss the functioning of Liver and Pancreas. (5)  
(c) What are the standards of drinking water? How Heavy Metals in the water affect the living organisms? (5)  
(d) What is radioactivity? Discuss the laws of radioactivity. Name two radioactive elements. (5) (20)
- Q. 5.** (a) What are the Plant nutrition elements? Enumerate them. (5)  
(b) What is difference between software and hardware? Give five examples of each. (5)  
(c) What are the types of earthquake waves? Discuss them. (5)  
(d) What are longitudinal waves, electromagnetic and Gamma radiations? Discuss them. (5) (20)

**(SECTION – B)**

- Q. 6.** (a) If the sum of four numbers is 105. When 03 is added to a number, twice of another number, five times of third number and fourth number become equal to each other. What are these numbers in ascending order? (5)
- (b) Find out the correct word from the given jumbled spellings. (5)  
(i) UCTREUTRS      (ii) LOVONAC      (iii) CIHPROSTATAC  
(iv) YNTIAUMH      (v) NNTHORER
- (c) Find the missing numbers in the series below (5)  
(i) 121, 11, 81, 9, ?, 7      (ii) 100, 50, 25, ?, 6.25      (iii) 4, 9, 64, 125, 1296, ?  
(iv) 2, 5, 12, 24, 48, ?      (v) 44, 22, 66, 33, 132, ?
- (d) If the sum of three digit number is 15 and sum of 10<sup>th</sup> and unit digit is 12. The difference of unit digit from 10<sup>th</sup> digit is equal to 02. What is the three digit number? (5) (20)

# Part - 2 - 1009

## MCQs

1. D    2. D    3. C    4. A    5. D    6. D  
7. D    8. A    9. A    10. B    11. C    12. A  
13. C    14. B    15. B    16. C    17. D    18. A  
19. A    20. A

## Part - 2

### Section - A

Q. NO. 2

(a)

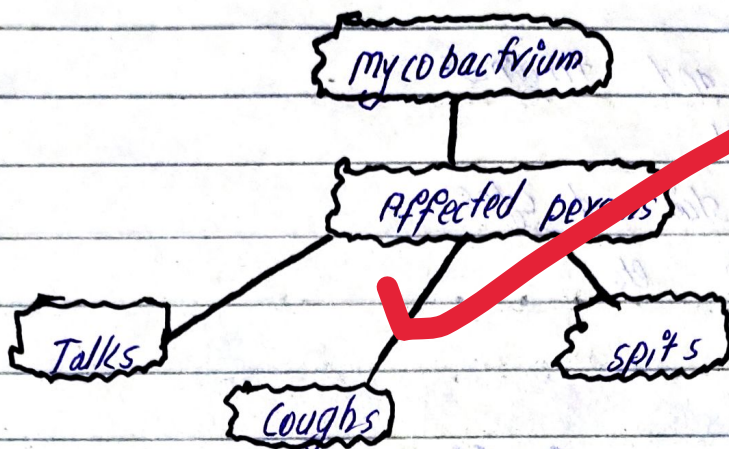
#### Understanding Tuberculosis

Tuberculosis refers to the bacterial infection which affects respiratory system. Tuberculosis affects lungs. Moreover, it can also affect bones such as joints and spine. According to WHO 2023, 103 million people died due to the T.B. It became the first disease which bypassed Covid 19 and HIV Aids.

#### Symptoms of TB

- o Persistent coughing (3 weeks)
- o Coughing blood
- o Night sweating
- o Loss of weight
- o Fever etc

## Causes of T.B



## Process of spreading T.B

### Prevention / treatment

- Vaccination: BCG is the only vaccine in which live anti-viruses attenuated in the affected persons.
- Isolation of T.B active cases
- Awareness and educating people

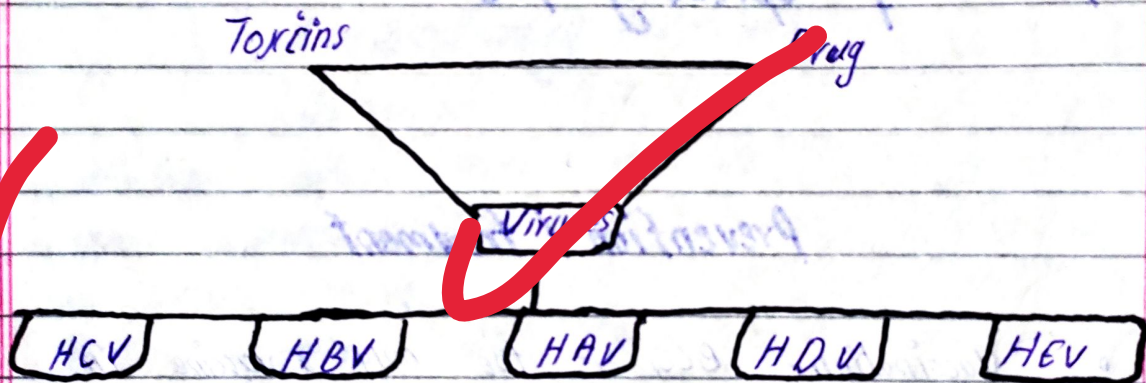
### Understanding Hepatitis

According to WHO, it is an inflammation of the liver. It causes numerous health crisis. According to WHO, in 2019, 1.2 million died due to hepatitis.

## Symptoms of Hepatitis

- o Black urine
- o Feeling sick and tiredness
- o Losing weight
- o Yellowing of skin and eyes
- o Abdominal pain etc

## Causes of Hepatitis



4.5

## Prevention and treatment

- o Sanitation must be ensured to overcome the virus
- o Avoid used medical instruments such as syringe, needles, drip etc
- o Avoid using sharp instruments of others such as nail cutter.
- o Do not touch the body bloods or body fluids
- o Awareness about protected sexual intercourse with affected partner.



(B)

## Understanding Fiber optic

Fiber optic refers to thin glass like human hair. This carries information through light signals. Information is being carried out from long distances. Fiber optic is one of the technologies. This has suppressed the traditional means of communications such as wire cable.

## Structure of Fiber Optic

**Core:** A glass centeric region, it carries information, light travels in it.

**Cladding:** It is the reflection of carried information region

**Outer coat:** It protects the fiber optic against risks.

**Jacket:** Jacket covers whole the cable.

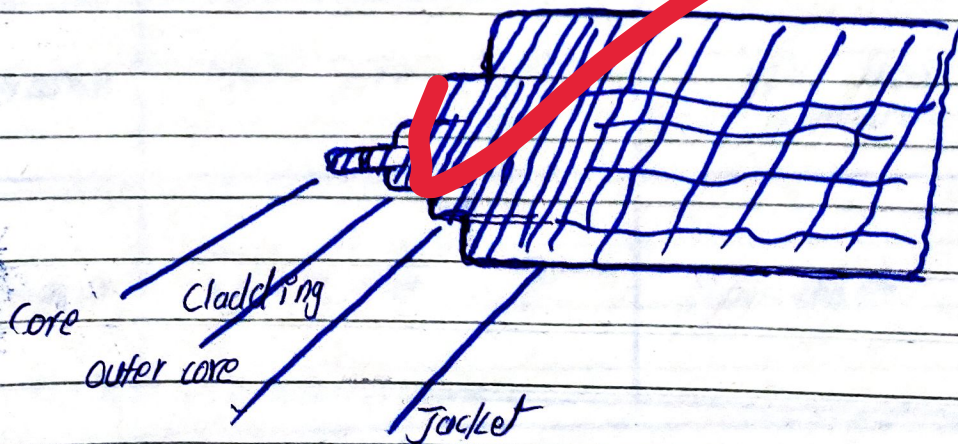


Figure 0.2 A Structure of fiber optic

## Mechanisms of Fiber optic

The propagation of light in the fiber optic must be confined. The light must not escape. This can be done through two processes:

: Internal reflection

: ~~External~~  $\beta$

Internal fraction

Fiber optic has three features which assist the process of fiber optic

1. A transmitter
2. A guide
3. A receiver

Thus, these all three make the process of fiber optic significant.

Draw the diagram showing its working

(c)

Features	middle latitude cyclon	Tornadoes
Def:	A system of rotating winds that is formed on low pressure regions. Thus, results in a disastrous weather.	A system of rotating wind formed from thunderstorms. It has a funnel shape wind.
Formation	latitude cyclones are being formed on low pressure regions due to the pressure of cold and warm polarity of air.	A tornado can be formed from humidity dry and cold winds backed by thunderstorms.
Rotation	Clock wise in the Southern and counter clock wise in the northern hemisphere.	The same
Duration	lasts 3 to 10 days	lasts less than 10 minutes
Diameter	100-200 km	300-400 km

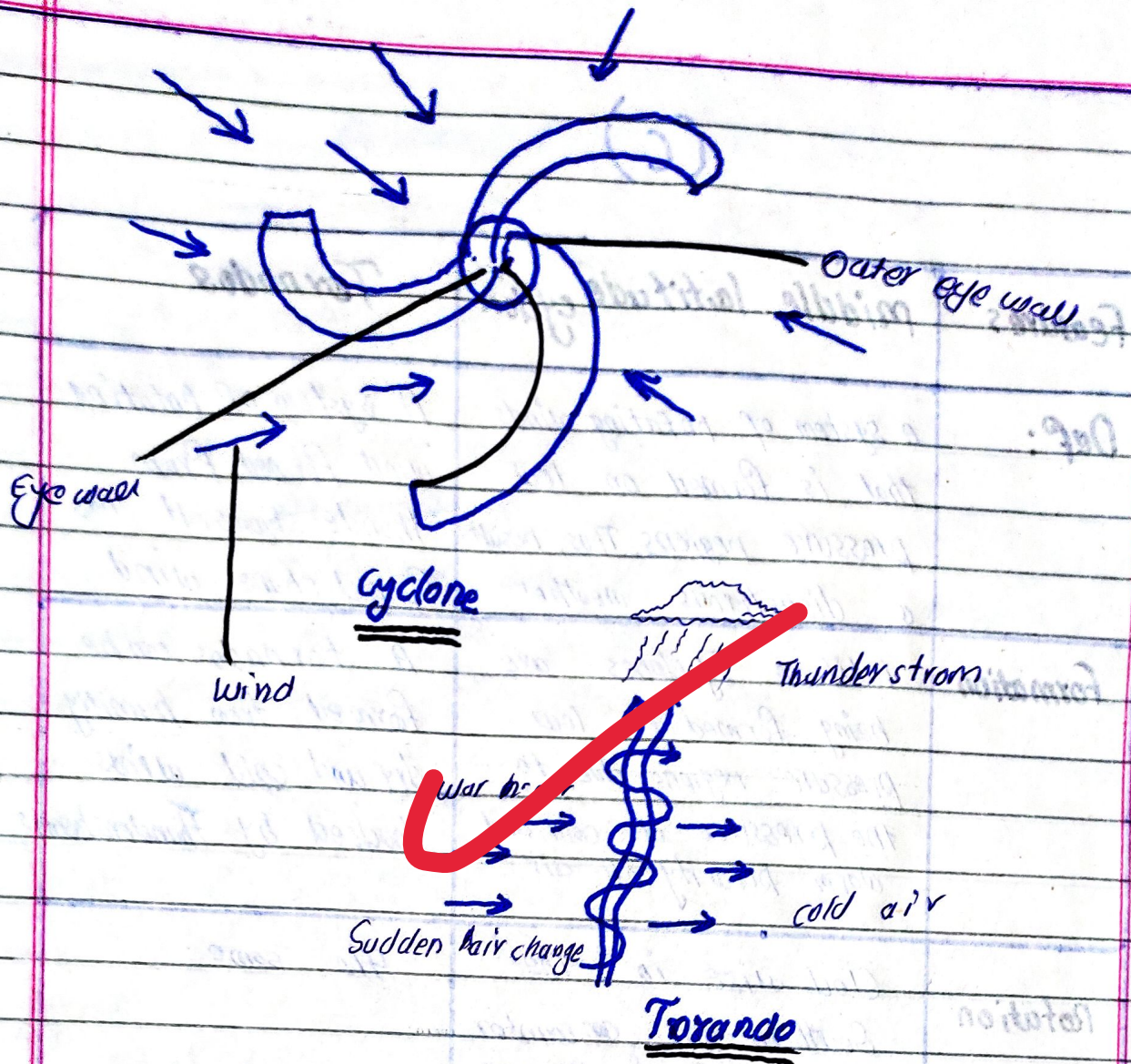


Figure 0.3 Structures of Tornado and Cyclone

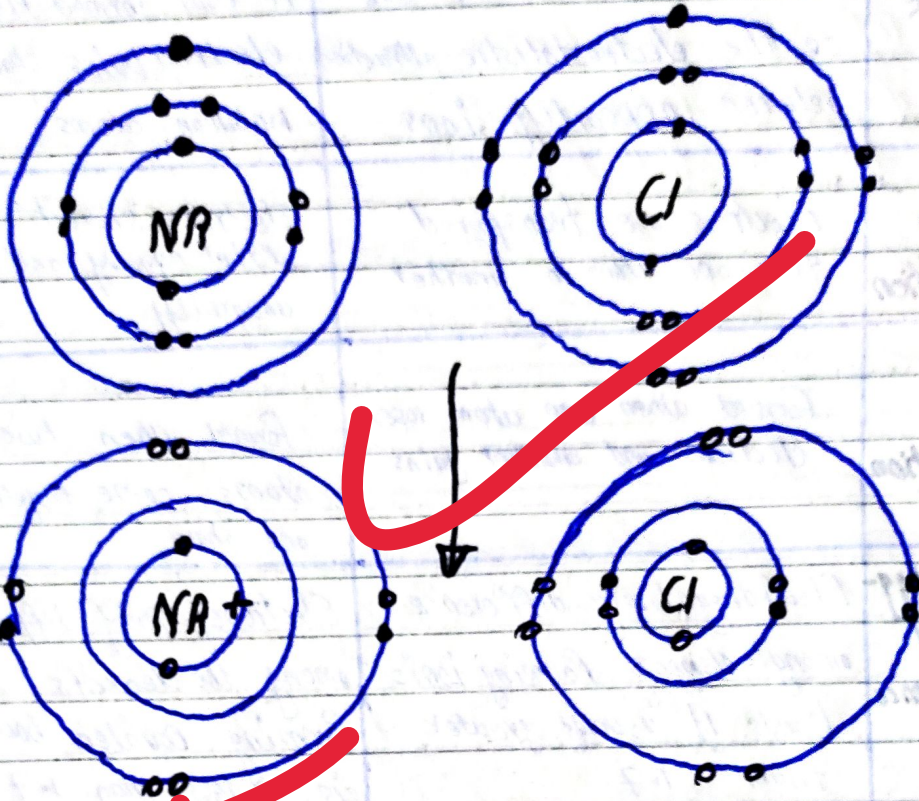
(c)

Features	IONIC Bond	Covalent Bonding
Define	The bond that is formed due to the electrostatic attraction between oppositely ions	A bond formed due electron pairs sharing between atoms
Electron interaction	Electrons are transferred from one atom to another	Electrons shared either equally and unequally
Bond Formation	Formed when one atom loses electrons and another gains	Formed when two atoms come together and share
Electronegativity difference	Electronegativity difference among elements forming ionic bonds. It is usually greater than 1.7	Electronegativity difference among the elements forming covalent bond is less than 1.7
Bond Strength	Generally stronger	Range from stronger to weaker
State at room temperature	Generally exists in solid state many ionic compounds form salts	Can be soluble or insoluble depending on polarity
Electrical Conductivity	Good conductors	Typically poor

Good answers!!

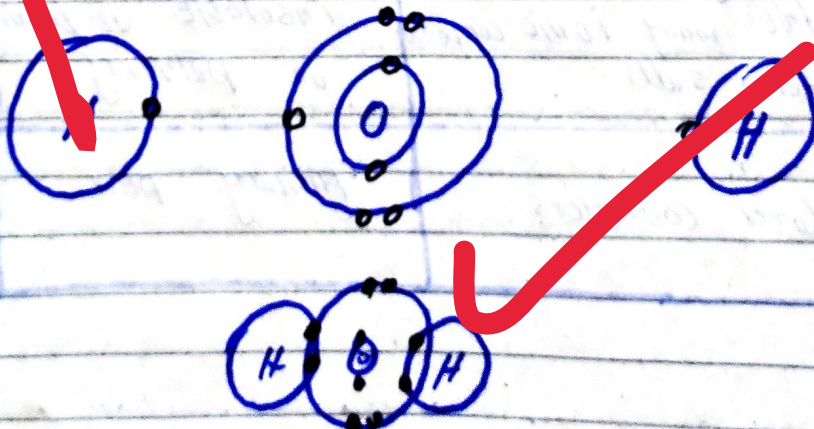
Examples:

Sodium Chloride  $\text{NaCl}$



IONIC Bond

with  $\text{H}_2\text{O}$



Covalent Bond