

**Assignment: IA2**

**SUBJECT: ENGLISH**

**Moti Guj -- Mutineer  
Rudyard Kipling**

**Q1. Why did Moti Guj love his master even though he would beat him some times?**

Ans. Moti Guj loved his master very much even though he would beat him sometimes because he knew that his master would beat him only because of excessive drinking. Moreover, after the beating was over, Moti Guj knew that his master would hug him & give him his favourite liquor.

**Q2. How long was Deesa to be away and how did he tell Moti-Guj about this?**

Ans. Deesa was supposed to be away from the plantation for ten days. Deesa had a peculiar way of making Moti Guj aware of his holidays. He took a tent peg and hit Moti Guj ten times on the nails of his forefeet. In this way, he convinced his elephant about his holidays.

**Q3. What were the lies Deesa told his employer? Why did he tell such dreadful stories?**

Ans. Deesa told three lies one after the other. At first, he told the planter that his mother had died but the planter reminded Deesa that he had told this lie twice before. Then Deesa told him that it was his aunt who had died. The planter was not convinced, So Deesa told the third lie that there was plague in his village due to which all his wives were dying. This also did not work because chihum informed the planter that Deesa had not even a single wife.

Deesa was not satisfied with the small amount of liquor he had. He wanted to take leave for some days in order to be properly drunk. That is why he told the planter these lies.

**Q4. How did Deesa look after Moti Guj?**

Ans. Deesa looked after Moti Guj very affectionately. Once a week, he would lead Moti Guj into the river. The elephant would lay by his side and his master would bathe him with the help of a coir swab a brick. Moti Guj was so used to this procedure that he would never misunderstand the pounding or smacking done by his master for him to turn over. Finally, he would carefully examine his eyes, ears & feet in case of sores.

**Q5. How did Moti Guj bid Deesa good - bye?**

Ans. MotiGuj put his trunk around Deesa & swung him twice in the air. This was his way of bidding good bye to his master.

**Q6. Why did MotiGuj become a mutineer?**

Ans. Moti Guj worked hard for ten days inspite of his loneliness without his master. But, when his master outstayed the leave & did not return on the said day, he became unmanageable & rebelled against the authorities. Thus, he became a mutineer.

**Q7. How did Moti Guj react to Deesa's return?**

Ans. When Deesa returned, he called his elephant using a mysterious elephant language. In response to this, Moti Guj came running to his master & fell into his arms, trumpeting with joy. Both of them wept & hugged each other.

**Q8. Why was chihun angry with Moti Guj? How did Moti Guj react to his remarks?**

Ans. Chihun was angry with Moti Guj because he disobeyed him & refused to work on the plantation. In spite of his threatening, he went out of the control & did not bother about chihun's threats. He bent his ears forward & trumpeted loudly in order to show violation against his temporary master.

**Old Man At The Bridge**  
**Ernest Miller Hemingway**

**Thinking about the Text**

**Q1. Why were the old man's clothes dusty? Why did he not cross the bridge?**

Ans. The old man's clothes were dusty because he had come walking twelve kilometers on foot. He did not cross the bridge as he was too tired to go any farther.

**Q2. Why did the old man leave San Carlos? Why did the Old man want to go to Barcelona?**

Ans. The old man left San Carlos because he was told by an army captain about the impending attacks by artillery. The soldier had told the Old man that the army trucks were going towards Barcelona. As he had no other place to go to, he thought of going to Barcelona itself.

**Q3. Oh, I said, not quite understanding ....'What was it about the old man's statement, I was taking care of animals; what was it that the narrator did not understand?**

Ans. The old man did not look like a shepherd or herdsman. So, the narrator could not understand what animals the old man could be taking care of.

**Q4. Where did the narrator expect the approaching battle to take place?**

Ans. The narrator expected the approaching battle to take place at some distance across the bridge.

**Q5. 'It's better not to think about the others.' What does the old man mean by 'the others'? Why does he say so?**

Ans. 'By the others,' the old man means his two goats and four pairs of pigeon. The old man was certain that his cat will take care of itself, but he was worried about the others. That is why he says, "it's better not to think about the others."

**Q6. Did the old man look upon his animals as his family? What made him worry about them? What did the old man fear would harm his animals?**

Ans. Yes, the old man looked upon his animals as his family. He was worried about them because he had no family other than these animals and he had to leave them so that to move himself to a safer place. He feared that artillery fire would harm them and they would be killed because of his absence there

**Q7. The old man was a victim of the war, but he had no wish to play a part in it. How do you come to know of this from the story?**

Ans. The old man was the victim of war because he had to leave home and his family. He only talked about animals. He had nothing to do with the war because he had no politics. He did not bother who wins or loses. He only cared about his pet animals.

**Q8. Wars have an adverse effect on our lives? How the story does bring out this truth?**

Ans. Since very long, wars have been a part of our lives. It has been adversely affecting the lives of living beings for centuries. Wars bring miseries, poverty, droughts, deaths and destruction. From the story 'Old Man at the Bridge', we saw, how the old man has to leave his animals; which were a part of his family, and his native village because of this dreadful war. He has to walk miles by foot although he was too old to go any farther, but, the war had left no alternative for him. We have read in the story how carts trucks and other vehicles along with people were hurrying in leaving their homes. So, this story has brought the whole truth about the destruction of wars and its adverse effect on our lives.

**I Cannot Remember My Mother**  
**Rabindranath Tagore**

**Central Idea:-**There is a great bond of love and affection between mother and her child. This association is such a strong one that even death cannot break it and the mother and her child keep on longing for each other whenever they are apart.

**Summary:-**The poem 'I Cannot Remember My Mother' has been penned down by 'Rabindranath Tagore'. The poet describes the sensitive and affectionate feelings of a child who has lost his mother when he was very young. He expresses the inability to recall the actual face and features of his mother but he uses various senses like sight, sound and smell to convey happy memories of his mother in him. The poet reveals his deep seated love for his mother by feeling her around him every now and then. The poet says that when he is busy at play, suddenly a tune comes to his mind and he remembers that this tune used to be sung by his mother when she rocked his cradle. The poet further says that in autumn, the shiuli trees in Bengal blossoms into fragrant tiny flowers for the morning worship in temple. So, the powerful fragrance of these flowers makes him to recapitulate the happy memories of this mother. In the last stanza, the poet recalls the quite, the caring look of his mother at his face when he looks at the vast expanse of the clear blue sky and he feels that the caring look of his mother has spread all over the sky.

**Q1. What is the poet doing when he remembers his mother?**

Ans. The poet is busy in playing when he remembers his mother.

**Q2. In what ways does the poet feel the presence of his mother?**

Ans. The poet feels the presence of his mother by recalling the tune she used to sing, by the smell of chamomile flowers in temples and by the calmness and stillness of the sky which he compares to his mother.

**Q3. What does the poet hear when he is at play?**

Ans. The poet hears a tune when he is at play and he considers it to be the same tune which his mother used to sing as she rocked his cradle to soothe him.

**Q4. What word do we use for the cradle song?**

Ans. We use the word 'lullaby' for the cradle song.

**Q5. Is the poet's mother dead or alive? How do you come to know?**

Ans. The poet's mother is dead because he seems to crave for his mother and uses his senses and various natural things to recall his mother. This clearly shows that she is not with him.

**Q6. What sights and smells remind the poet of his mother?**

Ans. The sight of the calm sky and the smell of fragrant shiuli flowers remind the poet of his mother.

**Q7. What are the feelings that this poem arouses in you?**

Ans. The poem makes us feel that mother and her child are closely associated and emotionally bound to each other. A mother forms an integral part of her child's life without whom he seems to be helpless and incomplete.

## Gulliver In Lilliput – I Jonathan Swift

### Thinking about the text

**Q1. Why did Reldressal visit Gulliver?**

Ans. Reldressal, the principal secretary of private affairs, visited Gulliver because he had been sent by Emperor to discuss with Gulliver some important problems of the state.

**Q2. How did Gulliver receive Reldresal?**

Ans. Gulliver received Reldresal with honour. He offered to lie down and hold Reldresal in his hand so that he could conveniently speak to him.

**Q3. What were the two political parties in Lilliput? What was their difference?**

Ans. The Lilliputians were divided into two political parties called High Heels and Low Heels. The two parties distinguished from each other according to the high and low heels of their shoes.

**Q4. Why was the Government in the hands of the low Heel though they were less numerous than the High Heels?**

Ans. The Emperor of the state was in favour of the low heels, and therefore himself wore low heels only. So the Government was in the hands of Low Heels although they were less in number than high heels.

**Q5. What was the external danger that the country had to face?**

Ans. The country was threatened with an invasion from Blefuscu, which was the other great empire of the law.

**Q6. What was the question of religious principle that gave rise to the war between Lilliput and Blefuscu?**

Ans. The war between the Lilliputians and Blefuscuans began over a question of religious principle, namely whether one should break an egg at the bigger end or at the smaller end.

**Q7. Why was the ancient way of breaking an egg prohibited in Lilliput?**

Ans. The ancient practice was to break an egg at the bigger end. But the present Emperor's grandfather as a boy, happened to cut one of his fingers while breaking an egg at the bigger end. So the Emperor; his father published an order prohibiting the practice of breaking eggs at the bigger end.

**Q8. How did the people take the new law?**

Ans. There was a bitter opposition to the new law. There were frequent rebellions on account of breaking an egg at the smaller end. One Emperor lost his life and another his crown in these rebellions.

**Q9. What was the Emperor of Blefuscu's part in the internal troubles of Lilliput?**

Ans. Many people suffered death at various times on account of breaking eggs at the bigger end because they preferred death over dishonour. Many rebels escaped to Blefuscu. The Emperor of Blefuscu gave them his sympathy and encouragement, thus interfering in the internal affairs of Lilliput.

**Q10. What was the teaching of their ancient religion about the right way of breaking eggs?**

Ans. The basic teaching of their ancient religion about the right way of breaking eggs was given in the 54<sup>th</sup> chapter of their Holy book. According to the book, "All believers should break the eggs at the convenient end."

**Q11. What in Reldresal's opinion was the meaning of teaching?**

Ans. In Reldresal's opinion, the meaning of the teaching was that each man should decide according to his conscience the convenient end of breaking an egg.

**Q12. What did Gulliver promise to do for the emperor?**

Ans. Gulliver promised to be the Emperor's loyal servant and was ready to defend his honour and the honour of his state in case of any invasion.

**Gulliver in Lilliput – II**  
**Jonathan Swift**

*Thinking about the text*

**Q1. Where was Blefuscu situated and what separated it from Lilliput?**

Ans. The empire of Blefuscu was an island situated to the north east of Lilliput. It was separated from Lilliput by a channel about 800 metres wide.

**Q2. Why did Gulliver avoid appearing on the north – east coast of Lilliput?**

Ans. Gulliver avoided appearing on the north – east coast of Lilliput so as not to be seen by Blefuscuian enemies.

**Q3. How deep was the channel? What were the devices with which Gulliver armed himself?**

Ans. The channel was about five feet deep in most places, and nowhere more than six. Gulliver took with him the strongest cable and bars of iron. The cable was as thick as pack thread. The bars were of the size of knitting needles.

Gulliver twisted the cables together and made fifty strong cords. Then he made fifty hooks by twisting three bars at a time. And finally, he fastened the hooks carefully to the cord.

**Q4. Why did Gulliver seek the advice of the most experienced sailor?**

Ans. Gulliver wanted to know the depth of the channel that he had to cross in order to reach Blefuscu. Thus, he sought the advice of the most experienced sailor.

**Q5. What did the Blefuscudian soldiers do while Gulliver was fastening hooks to the warships?**

Ans. While Gulliver was fastening hooks to the warships the Blefuscudian soldiers shot several thousand arrows at him. The arrows were as big as knitting needles. Many of them stuck in his hands and face and gave him sharp pain.

**Q6. What did Gulliver do to save his eyes?**

Ans. In order to save his eyes, Gulliver took out his eye glasses and put them on.

**Q7. Why did the ships not move when Gulliver pulled them?**

Ans. When Gulliver tried to pull the ships, he couldn't move it because the ships were held fast by their anchors.

**Q8. What did Gulliver do to relieve the pain caused by the arrows?**

Ans. To relieve the pain caused by the arrows, Gulliver rubbed an ointment that the Lilliputians had given him.

**Q9. What did the Emperor and his court think on seeing the fleet at a distance?**

Ans. The Emperor of Lilliput with all his court was waiting for Gulliver on the shore. They saw an entire Blefuscudian fleet advancing in the shape of a large half-moon, but could not distinguish Gulliver as he was in water upto his neck. They thought that Gulliver had been drowned and that the enemy fleet was advancing for battle.

**Q10. How did Gulliver show his loyalty to the Emperor?**

Ans. Gulliver saved the emperor from the danger of invasion from Blefuscu by drawing after him the entire fleet of the enemy. Gulliver shows his loyalty by defending the honour of Emperor and his country.

**Q11. How did the Emperor reward him for his service?**

Ans. The Emperor received Gulliver with honour and made him a Great lord on the spot.

## Beauty

### John Edward Masefield

**'Central idea'**: The poet seems to be enthralled by the beauty of his beloved. He compares her to all bounties of nature but finds her the most beautiful.

**'Summary'**: The poem 'Beauty' has been written by John Edward Masefield. The speaker of the poem is the poet himself. The poet says that he has witnessed the beautiful sights of dawn and sunset while standing on the plains and hill where wind blows. These sights appear to be as impressive and beautiful as the slow old tunes of Spain. The poet has also seen the beautiful daffodils blossoming in the month of April. He has seen the lovely grasses that spring up with the coming of the month. He has also enjoyed the soft warm shower of April rain.

The poet then mentions some other things of beauty that he has seen or heard. The poet says that he has heard the old song of sea waves .He has seen strange lands while standing under the arched white sails of ships. All these were the various things of beauty that poet has seen in this life. But the loveliest thing, God has ever shown to him is his beloved's voice, her hair and the dear red curve of her lips. He feels that his beloved is God's most beautiful creation in the world.

### Understanding the poem

**Q1. What are the various things of beauty the speaker has seen?**

Ans. The speaker has witnessed the beautiful sights of dawn and sunset .He has watched the beauty of daffodils and lovely grasses that spring up in April. He has also seen strange lands while standing under the arched white sails of ships. All these are the various things of beauty that the speaker has seen in his life.

**Q2. What are the loveliest of all things God has shown to the poet?**

Ans. The loveliest thing God has ever shown to the poet are his beloved's voice, her hair and the dear red curve of her lips.

**Q3. To whom do the words in the last line refer to?**

Ans. The words in the last line refer to the poet's beloved.

**Q4. Why does the poet compare dawn and sunset to slow old tunes?**

Ans. The coming of dawn and sunset is very soft and soothing .It is beautiful and pleasing like the slow old tunes of Spain.

**Q5. How does God's creation appear to the poet?**

Ans. The God's creation appears beautiful to poet. But the loveliest of these are the voice, hair and red curved lips of his beloved.

### Learning about literary devices

**Q1. What does the poet mean by the song of the blossoms? What does it symbolize?**

Ans. By " the song of blossoms", the poet means the soft rustling music of the blossoms when the wind blows through them. It symbolizes the beauty of nature.

**Q2. What is the contrast between the last and the rest of the poem? What does it suggest?**

Ans. The first six lines of the poem lists some beautiful creations of God like sight of dawn and sunset ,the soft warm showers of April rain ,the song of blossoms and sea waves etc. The last line shows what the poet considers to be the loveliest creation of God .They are the voice, the hair and red curved lips of his beloved.

**SUBJECT: SOCIAL SCIENCE**

**(Political Science)**

**CONSTITUTIONAL DESIGNS**

**Q1. Here are some false statements. Identify the mistake in each case and rewrite these correctly based on what you have read in this chapter.**

**a. Leaders of the freedom movement had an open mind about whether the country should be democratic or not after independence.**

**Ans:** Leaders of the freedom movement had an open mind that the country should be democratic after independence.

**b. Members of the Constituent Assembly of India held the same views on all provisions of the Constitution.**

**Ans:** Members of the Constituent Assembly of India held different opinions on the provisions of the Constitution.

**c. A country that has a constitution must be a democracy.**

**Ans:** A democratic country must have a Constitution.

**d. Constitution cannot be amended because it is the supreme law of country.**

**Ans:** The constitution needs to be amended because it has to be in accordance with people's aspirations and changes in society.

**Q2. Which of these was the most salient underlying conflict in the making of a democratic constitution in South Africa?**

- a. Between South Africa and its neighbours.
- b. Between men and women.
- c. Between the white majority and the black minority.
- d. Between the coloured minority and the black majority.

**Ans:** (c) Between the white majority and the black minority.

**Q3. Which of the provision that a democratic constitution does not have?**

- a. Powers of the head of the state
- b. Name of the head of the state
- c. Powers of the legislature
- d. Name of the country

**Ans:** (b) Name of the head of the state

**Q4. Match the following leaders with their roles in the making of the Constitution:**

a. Motila Nehru	i. President of the Constituent Assembly
b. B.R.Ambedkar	ii. Member of the Constituent Assembly
c. Rajendra Prasad	iii. Chairman of the Drafting Committee
d. Sarojini Naidu	iv. Prepared a Constitution of India in 1928

**Ans:** (a) (iv), (b) (iii), (c) (i), (d) (ii)

**Q5. Read again the extracts from Nehru's speech 'Tryst with Destiny' and answer the following:**

**a. Why did Nehru use the expression "not wholly or in full measure" in the first sentence?**

**Ans:** Nehru mentioned in his speech "not wholly or in full measure" because he wanted the full supports and very substantially for the people of India.

**b. What pledge did he want the makers of the Indian Constitution to take?**

**Ans:** The pledge of dedication to the services of India and her people and to the still larger course of humanity.

**c. "The ambition of the greatest man of our generation has been to wipe every tear from every eye." Who was he referring to?**

**Ans:** He refers here to Gandhiji.

**Q6. Here are some of the guiding values of the Constitution and their meaning. Rewrite them by matching them correctly.**

<b>a. Sovereign</b>	<b>i. Government will not favour any religion</b>
<b>b. Republic</b>	<b>ii. People have the supreme right to make decisions.</b>
<b>c. Fraternity</b>	<b>iii. Head of the state is an elected person</b>
<b>d. Secular</b>	<b>iv. People should live like brothers and sisters.</b>

**Ans:** (a) (ii), (b) (iii), (c) (iv), (d) (i)

**Q7. A friend from Nepal has written you a letter describing the political situation there. Many political parties are opposing the rule of the king. Some of them say that the existing constitution given by the monarch can be amended to allow more powers to elected representatives. Others are demanding a new Constituent Assembly to write a republican constitution. Reply to your friend giving your opinions on the subject.**

**Ans:** Dear friend,

I have read your letter and regarding the matter following are my suggestions:

- i.** You must continue your protest and make pressure on the king to make necessary amendments in the Constitution.
- ii.** Ours a democratic country and the elected members rule the country on our behalf. So we have self-satisfaction regarding democratic set-up.
- iii.** Democracy is must for every individual. So you must remain in contact with your countrymen and try to remain united.
- iv.** Now a day we also press our government to ask the Nepali King to listen his political leaders and solve the problem.

**Q8. Here are different opinions about what made India a democracy. How much importance would you give to each or these factors?**

**a. Democracy in India is a gift of the British rulers. We received training to work with representative legislative institutions under the British rule.**

**Ans:** It is not correct that democracy is gift of the Britishers to India people. Because we realised the pinch and started struggle to gain freedom.

**b. Freedom struggle challenged the colonial exploitation and denial of different freedoms to Indians. Free India could not be anything but democratic.**

**Ans:** It is correct that freedom struggle challenged the colonial exploitation and denial of different freedoms to Indians. So we fought and leaders like Bal Gangadhar Tilak said, "Freedom is my birth right and I shall have it". This strong slogan motivated Indians.

**c. We were lucky to have leaders who had democratic convictions. The denial of democracy in several other newly independent countries shows the important role of these leaders.**

**Ans:** We have leaders who had democratic attitudes and farsightedness.

**Q9. Read the following extract from a conduct book for 'married women', published in 1912.**

*'God has made the female species delicate and fragile both physically and emotionally, pitiably incapable the self- defence. They are destined thus by God to remain in male protection- of father, husband and son – all their lives. Women should, therefore, not despair, but feel obliged that they can dedicate themselves to the service of men.'*

**Do you think the values expressed in this para reflected the values underlying our Constitution? Or does this go against the constitutional values?**

**Ans:** According to Constitution of India, the above mentioned statement is wrong. We have equality before law and opportunity. So we cannot exclude the women folk.

**Q10. Read the following statements about a constitution. Give reasons why each of these is true or not true.**

**a. The authority of the rules of the constitution is the same as that of any other law.**

**Ans:** It is true. Because all the laws are directed according to constitution of the country.

**b. Constitution lays down how different organs of the government will be formed.**

**Ans:** Yes, it is true, that no government can be formed beyond the constitution.

**c. Rights of citizens and limits on the power of the government are laid down in the constitution.**

**Ans:** It is true that the rights of citizens are given in the constitution and we cannot cross the limitations.

## (History)

### **SOCIALISM IN EUROPE AND THE RUSSIAN REVOLUTION**

#### **Q1. What were the social, economic and political conditions of Russia before 1905?**

Ans.

- (i) **Social Condition:** The society was divided into two classes—the privileged and the non-privileged. The privileged class comprised of prosperous and influential people who held almost all the important offices of the state and most of the land was also under their control.
- (ii) **Economic condition:** As there was not ample capital in the country, more than half of the capital investment was made by the foreign investors who were interested only in making huge and quick profits without having any concern for the miserable conditions of the workers.

The Russian capitalists too, proved to be a source of exploitation of the workers. Whether factories had good working conditions or not, craft units and small workshops also sometimes had 15 hours of working day.

- (iii) **Political Condition:** The Russian polity was basically still feudal in nature. Vast tracts of land were held tax free by the clergy and the nobility also monopolized the high posts in the army and administration.

The new middle class which was slowly emerging in Russia began to make strident demands for some sort of representative government to be formed where access to high posts would be given on the basis of birth. Administration was also riddled with corruption and was inefficient.

#### **Q2. In what ways was the working population in Russia different from other countries in Europe, before 1917?**

Ans. Working population in Russia was different from the workers in other countries in Europe in many respects:

- Workers were divided by skill. But they did unite to strike work when they disagreed with employers.
- Peasants in Russia had no respect for nobility. Peasants wanted the land of the nobles to be given to them. Frequently, they refused to pay rent and even murdered landlords.
- Russian peasants pooled their land together periodically and their Commune divided it according to the needs of individual families.

#### **Q3. Why did the Tsarist autocracy collapse in 1917?**

Ans.

The revolutionary movement in Russia had been growing when the 1905 Revolution broke out. On 9<sup>th</sup> January 1905, a mass of peaceful workers with their wives and children were fired at in St. Petersburg while on its way to the winter Palace to present a petition to the Czar. More than a thousand of them were killed and thousands of others were wounded. This day is known as Bloody Sunday. The news of the killings provoked unprecedented disturbance throughout Russia.. It aroused the people and prepared them for revolution.

The Czar took Russia into the First World War. This proved fatal and brought about the final



breakdown of the Russia autocracy. By February 1917, six lakh soldiers had been killed in the war. There was widespread discontent throughout the empire as well as in the army. The condition was ripe for a revolution.

A demonstration by working class women trying to purchase bread. A general strike of workers followed, in which soldiers and others soon joined. On 12 March, 1917 the capital city of Petersburg fell into the hands of the revolutionaries. Soon the revolutionaries took Moscow, the Czar gave up his throne and the first Provisional Government was formed on 15th March 1917.

**Q4. Make two lists: one with the main events and the effects of February Revolution other with the main events and effects of the October Revolution. Write a paragraph on who was involved in each, who were the leaders and what was the impact of each on Soviet history.**

**Ans.**

**A. Events of February Revolution:**

1. In February 1917, food shortages were deeply felt in the workers quarters.
2. Parliamentarians wishing to pressure elected government were opposed to the Tsar's desire to dissolve the Duma.
3. On 22<sup>nd</sup> February, a lock out took place at a factory on the right bank of the River Neva.
4. On 23<sup>rd</sup> February, 1917 workers in fifty factories called a strike in sympathy of the factory workers of the River Neva.
5. In many factories women led the way to strikes. This came to be called the International Women's Day.
6. On 24<sup>th</sup> and 25<sup>th</sup> government called out the cavalry and police to keep an eye on striking and demonstrating workers and women participating in agitation.
7. On Sunday, 25 February the government suspended the Duma. Politicians (of the country) spoke out against the measure taken by the Tsar's government.
8. On 26<sup>th</sup> February, 1917 demonstrators returned in force to the streets of the left bank of the River Neva.
9. On 27<sup>th</sup> February the Police Headquarters were ransacked. The streets thronged with people raising slogans about bread, wages, better hours and democracy.
10. The government tried to control the situation and called out the cavalry once again. However, the cavalry refused to fire on the demonstrators.
11. On the evening of 27 February, 1917, soldiers and striking workers had gathered to form a 'Soviet' or 'Council' in the same building as the Duma met. This was the Petrograd Soviet.
12. On 28<sup>th</sup> February, a delegation went to see the Tsar, military commanders advised him to abdicate. He followed their advice.
13. On 2<sup>nd</sup> March, 1917 the military commanders abdicated their posts. Soviet leaders and Duma leaders formed a Provisional Government to run the country.
14. Petrograd had led the February Revolution that brought down the monarchy in February.
15. 1917 New Government declared that the future of Russia would be decided by the constituent assembly, elected on the basis of universal adult suffrage.
16. Army Officials, landowners and industrialist were influential in the provisional Government. But the liberals as well as socialists among them worked towards an elected government. Restricts on public meetings, and associations were removed. 'Soviets' like the Petrograd soviet were set up everywhere, though no common system of election was followed.

### Effects of the February Revolution 1917:

The major effects can be counted as follow:

1. It led to the downfall of the Tsar. With that the monarchy and the autocracy finally came to an end.
2. The first provisional government under the leadership of Kerensky was established.
3. Lenin had been exiled in Switzerland during the February revolution. He returned to Russia in April 1917. He took up the task of organizing the Bolshevik party as an instrument for revolution.
4. Failure of the Kerensky government created conditions for another revolution and ultimately resulted in the formation of the Bolshevik government.

### B. Events of the Revolution of October 1917:

1. In September, 1917 Lenin started discussions for an uprising against the government. Bolshevik supporters in the army, soviets and factories were brought together.
2. On 16 October 1917, Lenin persuaded the Petrograd Soviet and the Bolshevik Party to agree to a socialist seizure of power. A military Revolutionary Committee was appointed by the Soviet under the Leon Tritskill to organize the seizure. The date of the event was kept a secret.
3. The uprising began on 24 October. Sensing trouble, Prime Minister Kerensky had left the city to summon troops. At dawn, military men loyal to the provisional Government seized the buildings of two Bolshevik newspapers. Pro-government troops were sent to take over telephone and telegraph offices and the protect the Winter Place.
4. In a swift response, the Military Revolutionary Committee ordered its supporters to seize government offices and arrest ministers. Late in the day a ship shelled the Winter Palace. Other vessels sailed down the Neva (river) and took over different military points.
5. By nightfall, the city was under the committee's control and the ministers had surrendered. At a meeting of the All Russia Congress of Soviets in Petrograd, the major approved the Bolshevik action.
6. Uprisings took place in other cities also. There was heavy fighting especially in Moscow but by December, the Bolsheviks controlled the Moscow Petrograd area.

### Effects of the October Revolution, 1917:

The October Revolution brought about a dramatic change in Russia with its implications for the whole of Europe. Some of the important effects can be summed up as follows:

1. **Withdrawal from World War I** Russia withdrew from the war.  
It signed a treaty with Germany after ceding the territories that Germany demanded as a price for peace.
2. **Confiscation of land:** Following the decree on land, the estates of the landlords, the church and the Tsar were confiscation and transferred to the peasants, societies. The land was to be allotted to peasant families for cultivation by them.
3. **Abolition of Private Property:** Private property as the means of production was abolished. The motive of private profit was eliminated from the system of production.  
**Nationalization:** By the middle of 1918, banks and insurance companies, large industries, mines, water transport and railways were nationalized. Foreign debts were repudiated. Foreign investments were confiscated.
4. **Equal Status:** A declaration of the Rights of People was issued conferring the right of self-determination upon all nationalities.
5. **Fatal Blow to Aristocracy:** Autocracy was overthrown; it was destroyed and the power of the church was finished.

6. **Formation of the USSR:** The Tsar's empire was transformed into the USSR. The policies of the USSR were to be directed to the realization of the socialist ideal 'to each according to his need, from each according to his ability'.
7. **Economic Planning:** Economic planning was adopted as an instrument of state policy. To build a technologically advanced economy at fast rate and to eliminate inequalities in society.
8. **Income from Work:** All forms of private property were abolished. Work or labour became the sole source of income for livelihood. The right to work became a constitutional right. It became the duty of the state to provide employment to every individual.
9. **Education:** Universal education was given a high priority.
10. **Equality of Nationalities:** The equality of all the nationalities in the USSR was recognized in the constitution framed in 1924 and later in 1936.
11. **Autonomy of Republics:** The constitution gave the republics the autonomy to develop their own languages and cultures. This autonomy was particularly significant for the Asian republics which were backward in comparison to the European republics.

**Q5. What were the main changes brought about by the Bolsheviks immediately after the October Revolution?**

**Ans.**

1. Russia withdrew from the war, through formal peace treaty that was signed with Germany later, after ceding the territories that Germany demanded as price for peace.
2. Following the decree on land, the estates of the landlords, the church and the Tsar were confiscated and transferred to peasants' societies to be allotted to peasant families to be cultivated without hired labour.
3. The control of industries was transferred to shop committees of workers.
4. By the middle of 1918, banks and insurance companies, large industries, mines, water transport and railways were nationalized, foreign debts were repudiated and foreign investments were confiscated.
5. A Declaration of the rights of Peoples was issued conferring the right of self-determination upon all nationalities.
6. A new government called the council of People's Commissions, headed by Lenin was formed.

**Q6. Write a few lines to show what you know about:**

**Ans.**

- Kulaks
  - Duma
  - Women workers between 1900 and 1930
  - The Liberals
  - Stalin's collectivization programme.
1. **Kulaks:** It was a name for well to do farmers of Russia. During the period of Stalin to develop modern farms, and run them along industrial lines with machinery, it was considered necessary to eliminate Kulaks.
  2. **Duma:** It was an elected consultative Parliament, whose creation was allowed by the Tsar during the 1905 Revolution in Russia.
  3. **Women workers between 1900 and 1930:** Women workers constituted a significant proportion of industrial workers in Russia; about 31 percent of the workers were women. Women workers were paid fewer wages than male workers-varying from one-half to two

thirds. Women workers were more active in trade union activities, and were dedicated to their profession.

4. **The liberals:** Liberals had the following beliefs:

- They wanted a nation which supports all religions.
- They opposed the uncontrolled power of dynastic rules.
- They wanted to safeguard the rights of individuals against governments.
- They argued for a representative, elected parliamentary government, subject to laws interpreted by a well-trained judiciary that was independent of rules and officials.
- They did not believe in universal adult franchise. They wanted the right to vote to be limited to men who owned property.

5. **Stalin's collectivization programme:** Collectivization refers to setting up of collective farms. Collective farms were state-owned large farms. Collective farms were set up after.

- Eliminating 'kulaks', i.e., the large land owners, and confiscation of their lands by the state.
- Taking away small- sized lands belonging to poor peasants. Collective farms were known as kolkhoj. The main features of this arrangement were as follows;
- Peasants worked on the land.
- Profit was shared.

**(Geography)**

**PHYSICAL FEATURES OF INDIA**

**Q1. Choose the right answer from the four alternatives given below.**

- (i) **A landmass bound by sea on three sides is referred to as**  
**Ans. (c) Peninsula**
  
- (ii) **Mountain ranges in the eastern part of India forming its boundary with Myanmar are collectively called as**  
**Ans. (c) Purvachal**
  
- (iii) **The western coastal strip, south of Goa is referred to as**  
**Ans. (c) Kannad**
  
- (iv) **The highest peak in the Eastern Ghats is**  
**Ans. (c) Mahendragiri**

**Q2. Answer the following questions briefly.(ii)**

- (i) **What is the *bhabhar*?**  
**Ans.** The *bhabhar* is that part of the Northern Plains where the rivers, after descending from the mountains, deposit pebbles. It is a narrow belt, having a width of about 8 to 16 km and lying parallel to the slopes of the Shiwaliks.
  
- (ii) **Name the three major divisions of the Himalayas from north to south.**  
**Ans.** The three major divisions of the Himalayas from north to south are the Great Himalayas/Inner Himalayas/Himadri (Northernmost division), the Lesser Himalayas/Himachal and the Shiwaliks (Southernmost division).
  
- (iii) **Which plateau lies between the Aravali and the Vindhyan ranges?**  
**Ans.** Malwa plateau lies between the Aravali and the Vindhyan ranges.
  
- (iv) **Name the island group of India having coral origin.**  
**Ans.** Lakshadweep Islands are composed of small coral islands.

**Q3. Distinguish between:**

- (i) ***Bhangar* and *Khaddar*: *Bhangar* is the terrace-like feature present above the flood plains of the rivers. It is composed of older alluvium. It is the largest part of the Northern Plain. The soil of this region contains calcareous deposits locally known as kankar. The newer, younger deposits of the flood plains are called *khadar*. This region is very fertile as it gets renewed almost every year. Hence, it is ideal for intensive agriculture.**
  
- (ii) **Western Ghats and Eastern Ghats**

Western Ghats	Eastern Ghats
Mark the western edge of the Deccan Plateau	Mark the eastern edge of the Deccan Plateau
Continuous	Discontinuous and irregular
Higher; average elevation is 900–1600 meters	Lower; average elevation is 600 meters
Lie parallel to the western coast along the Arabian Sea	Lie parallel to the eastern coast along the Bay of Bengal

**Q4. Which are the major physiographic divisions of India? Contrast the relief of the Himalayan region with that of the Peninsular plateau.**

**Ans.** The major physiographic divisions of India are:

- |                              |                          |
|------------------------------|--------------------------|
| (i) The Himalayan Mountains  | (ii) The Northern Plains |
| (iii) The Peninsular Plateau | (iv) The Indian Desert   |
| (v) The Coastal Plains       | (vi) The Islands         |

The Himalayan Region	The Peninsular Plateau
Having a comparatively recent origin, it is made up of young fold mountains	It is the oldest landmass of the Indian subcontinent; was part of the Gondwana land
Consists of the loftiest mountains and deep valleys	Consists of broad and shallow valleys, and rounded hills
Formed due to the collision of the Indo-Australian and Eurasian plates	Formed due to the breaking and drifting of the Gondwana land
Composed of sedimentary rocks	Composed of igneous and metamorphic rocks
From the point of view of geology, this region forms an unstable zone	This region forms a stable zone

**Q5. Give an account of the Northern Plains of India.**

**Ans.** The Himalayan upliftment out of the Tethys Sea and the subsidence of the northern flank of the Peninsular Plateau resulted in the formation of a large basin. Gradually, the rivers flowing from the mountains in the north and the peninsular plateau in the south filled up this depression with deposits of sediments. This led to the formation of the Northern Plains of India.

The formation of the Northern Plains owes largely to the interplay of three major river systems, namely – the Indus, the Ganga and the Brahmaputra along with their tributaries. This physiographic division spreads over an area of 7 lakh square kilometers, and is 2,400 kilometers long and 320 kilometers broad. It is a densely populated region. The rich soil cover, adequate water supply and favorable climate make the region agriculturally very productive.

The Northern Plains are broadly divided into three sections.

The Punjab Plains – Western part of the Northern Plains; formed by the Indus and its tributaries

The Ganga Plains – Largest part of the Northern Plains; extends between Ghaggar and Teesta rivers

The Brahmaputra Plains – Eastern part of the Northern Plains; formed by the Brahmaputra and its tributaries

According to the variations in relief features, the Northern Plains are divided into four regions.

*Bhabar* – Narrow belt of pebbles lying parallel to the slopes of Shiwaliks

*Terai* – Wet, swampy, marshy region south of the *bhabar* belt

*Bhangar* – Terrace-like feature composed of older alluvium, lying above the flood plains

*Khaddar* – Newer, younger deposits of the flood plains

**Q6. Write short notes on the following.**

(i) **The Indian Desert**

(ii) **The Central Highlands**

(iii) **The Island groups of India**

- (i) Lying towards the west of the Aravali Hills, the Indian Desert is an undulating sandy plain covered with crescent-shaped and longitudinal sand dunes. This region is characterised by very little rainfall, an arid climate and low vegetation cover. Streams appear only during the rainy season. Luni is the only large river in this region.

- (ii) The part of the Peninsular Plateau lying to the north of the Narmada River, covering a major area of the Malwa Plateau, is known as the Central Highlands. They are **bound** by the Vindhya Range from the south and by the Aravali Hills from the northwest. The further westward extension merges with the Indian Desert while the eastward extension is marked by the Chotanagpur Plateau. The rivers draining this region flow from southwest to northeast. The Central Highlands are wider in the west but narrower in the east.
- (iii) India has two groups of islands. The Lakshadweep Islands lie in the Arabian Sea, to the **southwest** of the mainland. The Andaman and Nicobar Islands lie in the Bay of Bengal, to the southeast of the mainland.

Lakshadweep is composed of small coral islands, covering a small area of 32 square kilometers. Kavaratti Island is its administrative headquarters. The Andaman and Nicobar Islands are bigger in size and are more numerous and scattered. The entire group of islands is divided into Andaman (in the north) and Nicobar (in the south).

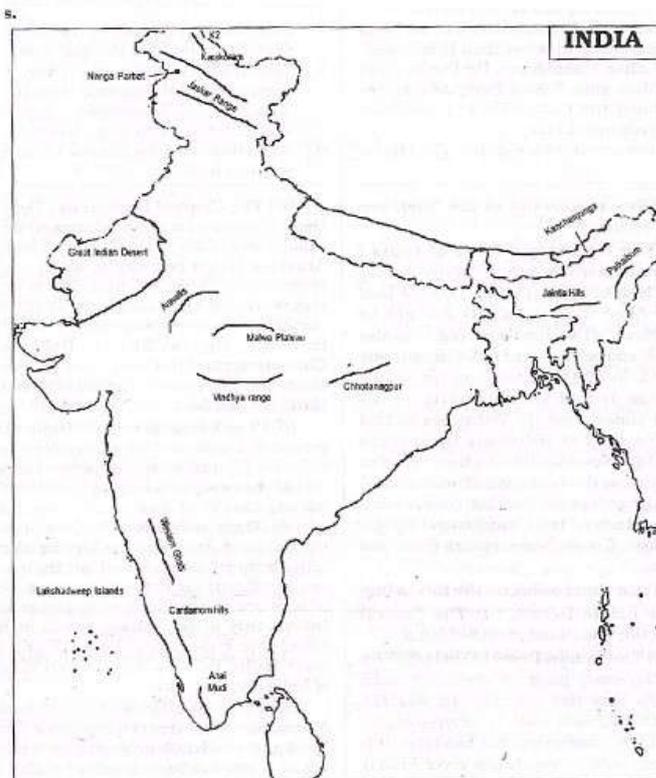
Both these island groups are rich in flora and fauna, and are of great strategic importance to the country.

### MAP SKILLS

**On an outline map of India show the following:**

- (i) Mountain and hill ranges – the Karakoram, the Zaskar, the Pathai Bum, the Jaintia, the Vindhya range, the Aravali and the Cardamom hills.
- (ii) Peaks – K2, Kanchenjunga, Nanga Parbat and the Anaimudi.
- (iii) Plateaus – Chotanagpur and Malwa.
- (iv) The Indian Desert, Western Ghats, Lakshadweep Islands.

**Ans.**



**Question 1:**

**Project/Activity**

Locate the peaks, passes, ranges, plateaus, hills, and duns hidden in the puzzle. Try to find where these features are located. You may start your search horizontally, vertically or diagonally.

E	M	K	U	N	L	N	A	T	H	U	L	A	R	I	A	H	I	A	T
M	H	A	S	J	M	A	N	J	K	M	A	J	L	B	H	O	R	P	J
J	N	V	F	A	E	T	D	C	A	R	D	E	M	O	M	L	O	M	K
C	R	E	I	I	Q	H	M	O	I	F	T	N	X	M	A	X	F	C	T
N	M	T	S	N	A	U	Q	R	M	S	A	N	A	D	I	D	A	N	J
A	B	X	A	T	G	A	R	O	U	L	F	V	D	I	K	P	T	D	C
C	Y	C	H	I	G	A	M	M	R	D	T	I	Z	L	A	J	P	O	K
H	R	T	K	A	N	C	H	E	N	J	U	N	G	A	L	U	L	B	E
O	O	M	O	P	I	T	P	N	O	S	S	D	D	K	S	P	D	O	K
T	D	A	N	M	L	M	D	D	C	S	A	H	L	S	A	I	E	E	J
A	R	R	K	A	G	T	H	A	R	H	E	Y	D	H	H	A	I	A	R
N	S	A	A	L	I	A	T	L	E	I	Y	A	B	A	Y	T	H	R	L
A	Z	V	N	W	R	E	D	S	P	P	A	N	H	D	A	O	J	U	K
G	O	A	N	A	I	M	U	D	I	K	D	P	M	W	D	A	B	P	E
P	A	L	L	J	S	H	E	V	R	I	Y	E	V	E	R	E	S	T	M
U	O	I	M	Y	R	Y	P	A	T	L	I	G	J	E	I	T	H	A	R
R	K	I	Q	S	L	A	H	C	N	A	V	R	V	P	E	A	T	S	P

Vertical	Horizontal
CHOTANAGPUR	
ARAVALI	
KONKAN	NATHULA
JAINZIA	CARDEMOM GARO
MALWA	KANCHENJUNGA
NILGIRI	ANAIMUDI
SHIPKILA	EVEREST
VINDHYA	PATLI
BOMDILA	
SAHYADRI	
SATPURA	



## (Economics)

### MONEY & BANKING

#### A. Fill in the blanks:

- i. Reserve Bank of India issues currency notes on behalf of the central Government.
- ii. Banks charge a higher interest rate on loans than what they offer on deposits.
- iii. Collateral is an asset that the borrower owns and uses as a guarantee until the loan is repaid to the lender.
- iv. A saving account is the simplest form of bank account which can be opened by any individual for encouraging savings.
- v. The most common form of payments being made instead of cash is a bank instrument called a cheque.
- vi. This is also called a remotely created cheque, Demand Draft.

#### B. One word answer:

- i. The central bank of India, Reserve Bank of India.(RBI)
- ii. One nationalized Bank of India , State Bank of India.(SBI)
- iii. One privately owned bank in India, HDFC Bank.
- iv. One post office savings scheme, Senior Citizen Savings Scheme.
- v. One cooperative bank in rural India giving loans to farmers Grameen Bank.

#### C. Very short /short answer type questions.

##### 1. What is double coincidence of wants? Explain with an example of your own.

**Ans:** “Double coincidence of wants” means “what a person desires to sell is exactly what the other wishes to buy”. For example, a farmer has surplus rice and needs to buy clothes. On the other hand, the clothes merchant has clothes but needs rice. When both parties agree to buy and sell commodities to each other, this is double coincidence of wants.

##### 2. Why money is called a medium of exchange?

**Ans:** Money is any medium that can be exchanged for goods and services. Since money acts as an intermediate in the exchange process, it is called a medium of exchange.

##### 3. What are different forms of modern currency?

**Ans:** The different forms of modern currency include plastic money i.e debit card and credit card.

##### 4. Who is authorized to issue currency in India?

**Ans:** The Central Bank of India i.e Reserve Bank of India is authorized to issue currency in India.

##### 5. Why can no one refuse to accept payment in rupees?

**Ans:** The rupee is a universally accepted medium of exchange in India because it is authorized by the government of the country and no person in India can legally refuse a payment made in rupees.

##### 6. Why are the deposits in the bank account called deposits?

**Ans:** The deposits in the bank account are called deposits because the money deposited is safe and secure with the bank and can be withdrawn as and when it is required.

### 7. How do banks mediate between those who have surplus money and those who need money?

**Ans:** People deposit their extra money in the bank and majority of these deposits are used by banks to extend loan facility to those customers who are in need of money.

### 8. Define a cheque?

**Ans:** A cheque is a paper instructing the bank to pay a specific amount from the person's account to the person in whose name the cheque has been issued. The maker of a cheque is called the 'drawer' and the person directed to pay is the 'drawee'.

### 9. Define a Loan.

**Ans:** Loan is a facility that refers to an agreement in which the lender supplies the borrower with money, goods or services in return for the promise of future payment.

### 10. Why do lenders ask for collateral while lending?

**Ans:** Collateral is the asset that the borrower owns (land, business, house, vehicle, livestock, and deposits with banks) and is kept with the lender / bank as a guarantee till the loan is repaid in full. If the borrower fails to repay the loan, the lender has the right to sell the collateral to obtain payment.

## D. Long answer type questions:

### 1. What are the various forms of modern money?

**Ans.** The modern forms of money include currency, Demand Deposits, and Plastic money (debit cards, credit cards)

- **Currency:** Every country has its own currency. In India currency notes and coins are issued by the reserve bank of India on behalf of the government.
- **Demand Deposits:** The other form in which people hold money can be as deposits with banks and these deposits can be withdrawn anytime on demand.
- **Plastic Money:** Refers to the hard plastic cards which we use every day in place of actual bank notes. They come in many different forms such as debit card, credit card.

### 2. What is the procedure of opening a savings bank account?

**Ans.** The first step involves choosing or selecting a bank with which a person wants to open an account. The next step is filling up the prescribed application form. The application involves information regarding name, residence and space for fixing a photograph. The filled up application form is to be submitted to the bank, along with necessary relevant documents like identity proof, residence proof etc. After successful submission of the form, the bank issues an account number and provides passbook which contains particulars of the account holder. The bank may also issue ATM card.

### 3. How can you withdraw money from a Savings Bank Account?

**Ans.** The cash can be withdrawn by visiting the branch and filling withdrawal form. The bank official will identify the person through passbook photograph and signature on withdrawal form. The other procedure is by cheque. The cheque can be signed and issued by the account holder and the bank will issue cash against such cheque. ATM (Automated Teller Machine) is also used to withdraw money. After inserting the card, ATM will ask for pin (electronic key) to proceed. The machine will ask for options like amount to be drawn etc and at the end of transaction the ATM will provide slip showing amount withdrawn and balance remaining with the bank.

### 4. What are the various forms of Plastic money?

**Ans.** Plastic money comes in various forms like:

- A debit card also known as a bank card is a plastic card that provides the cardholder electronic access to his bank account. The card, where accepted, can be used instead of cash when making purchases. Mostly the debit card is used for ATM transactions.

- A credit card allows the cardholder to pay for goods and services based on the holder's promise to pay for them. The issuer of the card creates a revolving account and grants a limit of credit to the consumer (or the user) from which the user can borrow money for payment to a seller as a cash advance to the user.

**5. Explain the various credit and loan activities of banks with an example.**

**Ans.** People deposit their surplus funds with the banks and banks keep only a small portion of their deposits as cash with themselves to pay depositors who may want to withdraw their money on any day. The balance of deposits is lent out to those who are in need of money. Banks charge higher interest from the loans as compared to the interest paid to the deposit. The difference between two rates is the bank's profit.

Suppose a person deposits Rs. 1 lakh in the bank. As per rule, the bank keeps certain percentage; say 20% as cash, i.e. 20 thousand. The bank can lend the rest of loan and claim the amount back in future along with the interest.

OASIS Hr. Sec. Educational Institute

## **SUBJECT: SCIENCE**

### **(Physics)**

### **FORCE AND LAWS OF MOTION**

#### **Force:**

Force is the 'push' or 'pull' which can make a body move, stop a moving body, change the direction and speed of a moving body. Force cannot be seen but the effect of force on an object can be seen or felt.

#### **Definition of Force**

A force is physical quantity which causes or tends to cause a motion in an object at rest or changes or tends to change the direction of motion of a moving object or changes or tends to change the size and shape of an object or change or tends to change the speed of an object.

#### **Effect of force**

A force produces the following effects:-

It can move or tend to move an object.

It can stop or tend to stop an object in motion.

It can change or tend to change the direction of motion of an object.

It can increase or decrease the speed of an object.

It can change the shape or size of an object.

Force can move or tend to move an object.

#### **Balanced and unbalanced forces:**

If a set of forces acting on a body produces no acceleration in it, the forces are said to be balanced. If it produces a nonzero acceleration, the forces are said to be unbalanced.

#### **Definition of balanced force :-**

When two forces of equal magnitude but acting in opposite directions on an object simultaneously then the object continues to be in its state of rest or of uniform motion in a straight line. Such forces acting on the object are known as balanced force.

#### **Definition of Unbalanced force:-**

When two forces of unequal magnitude act in opposite directions on an object simultaneously then the object moves in the direction of a greater force. These forces acting on the object are known as unbalanced forces.

#### **Galileo Galilei:**

Galileo first of all said that object move with a constant speed when no forces act on them. Galileo said that if net external force is zero, a body at rest continues to be at rest, and a body in uniform motion continues to move uniformly along the same straight line. This is Galileo's law of inertia.

This, inherent property of all bodies, by virtue of which they cannot change by themselves their state of rest or of uniform motion along a straight line is called Inertia.

### **NEWTON'S LAW OF MOTION**

#### **Newton's first law of motion**

A body at rest will remain at rest and a body in motion will remain in uniform motion unless an unbalanced forces acts on it to change its state of rest or of uniform motion.

The above law can be understood in two parts.

(i) A body at rest remains at rest unless an external unbalanced force acts on it to change its state of rest.

Ex. Consider a wooden block kept on a horizontal surface at rest. It will remain at rest unless somebody moves it.

(ii) A body in motion will remain in uniform motion unless an external unbalanced force acts on it to change its state of uniform motion.

Newton's first law gives the qualitative definition of force. As it tells us about an agent without which acceleration is not possible.

Newton's first law is also called the law of inertia.

Newton's first law consists of two parts

(i) A body cannot change its state of rest by itself.

(ii) A body cannot change its state of motion by itself.

### **INERTIA**

The tendency of a body to oppose any change in its state of rest or of uniform motion is called inertia of the body.

Or

Inherent property of all bodies, by virtue of which they cannot change by themselves their state of rest or of uniform motion along a straight line, is called Inertia.

#### ***Types of Inertia: -***

(a) Inertia of rest

The resistance offered by a body to change its state of rest is called inertia of rest.

or

The tendency of a body to oppose any change in its state of rest is known as inertia of rest.

(b) Inertia of motion

The resistance offered by a body to change its state of uniform motion is called inertia of motion.

or

The tendency of a body to oppose any change in its state of uniform motion is known as inertia of motion.

(c) Inertia of direction

The resistance offered by a body to change its direction of motion is called inertia of direction.

or

The tendency of a body to oppose any change in its direction of motion is known as inertia of motion.

#### **Examples of inertia or first law of motion**

(i) When a branch of a tree is shaken vigorously, ripe fruits get detached and fall. This is because the branch comes in motion but the fruits at rest tend to remain at rest due to inertia of rest and get detached. After the fruits get detached, gravity plays its role in making the fruits fall.

(ii) For removing dust from a carpet, we hang the carpet and then beat it with a stick. Due to the beating action, the carpet moves along the stick and the dust particle, in a tendency to remain at rest, get detached from the carpet.

(iii) When you hit a striker on a pile of carom counters, you will observe that only the lowest counter moves away. The rest of the pile remains in the original position.

(iv) A bullet fired from a gun makes a small hole in the window pane while passing through it, but the stone striking the window pane breaks it into pieces. When a bullet strikes the window pane, only a small portion of the window pane where the bullet strikes comes in motion because the bullet makes contact with the pane for a very short time due to its high speed. On the other hand, the remaining portion of the window pane remains at rest due to inertia of rest. Thus, a small hole is made by the bullet in the window pane.

The speed of the stone is very small compared to the speed of the bullet. So the stone makes contact with the window pane for longer period of time. During this longer time. The whole window pane comes in motion and hence breaks into pieces.

(v) Suppose we are standing in a stationary bus and the driver starts the bus suddenly. We get thrown backward with a jerk.

(vi) When a horse starts suddenly, the rider tends to fall backwards on account of inertia of rest of upper part of the body.

## LINEAR MOMENTUM

### **Definition:**

The linear momentum of a body is defined as the product of mass and velocity. It is denoted by p.

Linear momentum = mass (m) × velocity (v)

$$p = mv$$

### **Conclusion:-**

The momentum of the moving body is proportional to

- (i) Mass of the body and
- (ii) Velocity of the body.

Momentum is a vector quantity.

Magnitude of momentum, P = mass × speed

or

$$P = mu$$

Direction of momentum of a body is same as that of the direction of the velocity of the body.

Units of momentum

Momentum = mass × velocity

Unit of momentum = unit of mass × unit of velocity

S.I. unit of momentum is kg m/s.

### **Note:**

(i) Linear momentum has a sense of direction. Therefore it is a vector quantity.

(ii) The direction of linear momentum of a body at any instant is same as that of the velocity of the body at that instant.

(iii) A body moving in a curved path, the direction of velocity at a point is a tangent drawn at that point. Therefore, the direction of linear momentum is also tangential.

### Second law of motion

According to this law, the change in momentum of a body per unit time (i.e. rate of change of momentum) is directly proportional to the unbalanced force acting on the body and the change in momentum takes place in the direction of the unbalanced force on the body.

i.e.  $F \propto dp/dt$

Where, dp = change in momentum and dt = time taken for this change in momentum.

### Derivation of second law of motion:-

Consider a body of mass m moving with initial velocity u. Let a force F acts on the body for time t and attains a velocity v.

Initial momentum of the body,  $P_i = mu$

Final momentum of the body,  $P_f = mv$

Now, change in momentum of the body =  $P_f - p_i$

Time taken to change this momentum = t

Rate of change of momentum =  $(p_f - p_i)/t$

According to the definition of Newton's second law of motion

Force applied  $\propto$  rate of change of momentum

$$F \propto (p_f - p_i)/t$$

$$F \propto (mv - mu)/t$$

$$F \propto m(v - u)/t \quad \dots\dots\dots (i)$$

Since  $(v - u)/t = a$

Therefore, equation (i) can be written as

$$F \propto ma$$

$$\text{or } F = k ma \dots (ii)$$

Where k is constant of proportionality. Put the value of k = 1 in equation (ii), we get

$$F = ma$$

Thus, force acting on the body is directly proportional to (i) its mass (m) and (ii) its acceleration (a).

This Equation gives the mathematical form of Newton's second law of motion.  
The unit of force is Newton

### **Definition of one newton (N):-**

The force is said to be 1 newton if it produces  $1 \text{ m/s}^2$  acceleration in a body of 1 kg mass.

### **SOME APPLICATIONS OF SECOND LAW**

Example 1. A cricket player lowers his hands while catching a ball.

By doing so the player increases the time interval for the change in momentum. Because of this the force experienced by his hands is less.

Example 2. A karate player breaks the pile of the tiles or bricks with a single blow.

Example 3. Our hand hurts more when we hit the wall than when we hit a sponge seat of a car.

### **Newton's third law of motion**

Definition: For each and every action, there is equal and opposite reaction.

If a body A exerts force on another body B, then B exerts a force on A, the two forces acting along the same line. The two forces are called action-reaction pair. Any one may be called 'action' and the other 'reaction'.

Action and reaction do not cancel out the effect of each other because they act on different bodies.

$$F_{12} = - F_{21}$$

### **Some examples of Newton's third law :**

1. When a bullet is fired from a gun, we observe recoiling of the gun. The gun acts on bullet i.e., exerts a force on the bullet; simultaneously, the bullet reacts on the gun.

2. While walking or running, you push the ground in the backward direction with your feet. The ground simultaneously exerts a force of equal magnitude in the forward direction on feet. This force enables us to walk.

3. When a man jumps from a boat, the boat also experiences a backward jerk. This is due to the action-reaction pair as shown in figure.

4. Inflate a balloon and leave it. You will observe that the balloon moves in opposite direction to the opening in balloon through which the air is coming out.

5. How do we swim?

While swimming, a swimmer pushes the water backward with his hands. The reaction offered by the water to the swimmer pushes him forward.

6. A boatman pushes the river bank with a bamboo pole to take his boat into the river.

When the boatman pushes the river bank with a bamboo pole, the river bank offers an equal and opposite reaction. This reaction helps the boat to move into the river.

7. Why a fireman struggles to hold a hose-pipe?

A fireman has to make a great effort to hold a hose-pipe to throw a stream of water on fire to extinguish it. This is because the stream of water rushing through the hose-pipe in the forward direction with a large speed exerts a large force on the hose-pipe in the backward direction.

### **LAW OF CONSERVATION OF MOMENTUM**

In an isolated system, momentum before collision is equal to the momentum after collision. That means total momentum remains conserved.

Mathematically it can be written as

$$m_1 v_1 + m_2 v_2 = m_1 u_1 + m_2 u_2$$

### **Derivation of the law of conservation of momentum**

Consider a system consisting of two bodies A and B of (say glass spheres) masses  $m$  and  $m$  respectively. Let these bodies are moving with velocities  $u_1$  and  $u_2$ . Let  $u_1 > u_2$ . Let these bodies collide with each other for a small interval of time 'dt'. At the time of collision, body A exerts a force  $F$  on body B and body B exerts equal and opposite force ( $-F$ ) on body A. Due to these forces, the momentum of the bodies changes. Let  $v_1$  and  $v_2$  be the velocities of body A and body B respectively after the collision.

Initial momentum of body A =  $m_1 u_1$

Initial momentum of body B =  $m_2 u_2$

Final momentum of body A =  $m_1 v_1$

Final momentum of body B =  $m_2 v_2$

Total momentum of the system before collision =  $m_1 u_1 + m_2 u_2$

Total momentum of the system after collision =  $m_1 v_1 + m_2 v_2$

Now, the rate of change of momentum of body A =  $(m_1 v_1 - m_1 u_1)/t$

According to Newton's second law of motion,

Force acting on body A = rate of change of momentum of body A

$$F_a = (m_1 v_1 - m_1 u_1)/t \quad \dots\dots\dots (1)$$

Now, rate of change of momentum of body B =  $(m_2 v_2 - m_2 u_2)/t$

i.e.  $F_b = (m_2 v_2 - m_2 u_2)/t \quad \dots\dots\dots (2)$

from newton's 3<sup>rd</sup> law, we know

$$F_a = - F_b$$

Substituting the values from eqns. (1) and (2), we get

$$(m_1 v_1 - m_1 u_1)/t = - ((m_2 v_2 - m_2 u_2)/t)$$

$$m_1 v_1 + m_2 u_2 = m_1 u_1 + m_2 v_2$$

i.e. Total momentum of the system (i.e. bodies A and B) before collision

= Total momentum of the system (i.e. bodies A and B) after collision.

This is the law of conservation of linear momentum.

### **BOOK QUESTIONS**

#### ***Question 1***

Which of the following has more inertia?

- (a) A rubber ball and a stone of the same size?
- (b) A bicycle and a train?
- (c) A five-rupee coin and a one-rupee coin?

**Answer:**

- (a) A stone of the same size
- (b) A train
- (c) A five-rupee coin

As the mass of an object is a measure of its inertia, objects with more mass have more inertia.

#### ***Question 2***

In the following example, try to identify the number of times the velocity of the ball changes.

“A football player kicks a football to another player of his team who kicks the football towards the goal the goalkeeper of the opposite team collects the football and kicks it towards a player of his own team”.

Also identify the agent supplying the force in each case.

**Answer:**

<b>Agent supplying the force</b>	<b>Change in velocity of ball</b>
1. First player kicks a football.	→ Velocity from '0' changes to 'u'
2. Second player kicks the football towards the goal.	→ Velocity changes again
3. The goalkeeper collects the football.	→ Velocity becomes 0
4. Goalkeeper kicks it towards a player of his team.	→ Change in velocity takes place

The velocity of football changed four times.

#### ***Question 3***

Explain why some of the leaves may get detached from a tree if we vigorously shake its branch.

**Answer:**

When the tree's branch is shaken vigorously the branch attains motion but the leaves stay at rest. Due to the inertia of rest, the leaves tend to remain in its position and hence detaches from the tree to fall down.

#### Question 4

Why do you fall in the forward direction when a moving bus brakes to a stop and fall backwards when it accelerates from rest?

**Answer:**

When a moving bus brakes-to a stop: When the bus is moving, our body is also in motion, but due to sudden brakes, the lower part of our body comes to rest as soon as the bus stops. But the upper part of our body continues to be in motion and hence we fall in forward direction due to inertia of motion.

When the bus accelerates from rest we fall backwards: When the bus' is stationary our body is at rest but when the bus accelerates, the lower part of our body being in contact with the floor of the bus comes in motion, but the upper part of our body remains at rest due to inertia of rest. Hence we fall in backward direction.

#### NCERT Textbook Page 126-127

#### Question 1

If action is always equal to the reaction, explain how a horse can pull a cart?

**Answer:**

The third law of motion states that action is always equal to the reaction but they act on two different bodies.

In this case the horse exerts a force on the ground with its feet while walking, the ground exerts an equal and opposite force on the feet of the horse, which enables the horse to move forward and the cart is pulled by the horse.

#### Question 2

Explain why is it difficult for a fireman to hold a hose, which ejects a large amount of water at a high velocity.

**Answer:**

The water that is ejected out from the hose in the forward direction comes out with a large momentum and equal amount of momentum is developed in the hose in the opposite direction and hence the hose is pushed backward. It becomes difficult for a fireman to hold a hose which experiences this large momentum.

#### Question 3

From a rifle of mass 4 kg, a bullet of mass 50 g is fired with an initial velocity of 35 m/s. Calculate the velocity of the rifle.

**Answer:**

( $m_1$ ) Mass of rifle = 4 kg

( $m_2$ ) Mass of bullet = 50 g = 0.05 kg

( $v_2$ ) Velocity of bullet = 35 m/s

( $v_1$ ) Recoil velocity of rifle = ?

According to the law of conservation of momentum

Momentum of rifle = momentum of bullet

$$m_1 v_1 = m_2 v_2$$

$$4 \text{ kg} \times v_1 = 0.05 \times 35 \text{ m/s}$$

$$\therefore v_1 = \frac{0.05 \times 35}{4} = \frac{1.75}{4}$$

$$v_1 = 0.4375 \text{ m/s}$$

$$\therefore \text{Recoil velocity of rifle} = 0.4375 \text{ m/s}$$

#### Question 4

Two objects of masses 100 g and 200 g are moving along the same line and direction with velocities of 2 m/s and 1 m/s respectively.

They collide and after the collision the first object moves at a velocity of 1.67 m/s. Determine the velocity of the second object.



**Answer:**

$$m_1 = 100 \text{ g} = 0.1 \text{ kg}$$

$$m_2 = 200 \text{ g} = 0.2 \text{ kg}$$

$$u_1 = 2 \text{ m/s}$$

$$u_2 = 1 \text{ m/s}$$

After collision

$$v_1 = 1.67 \text{ m/s}$$

$$v_2 = ?$$

$$m_1 u_1 + m_2 u_2 = m_1 v_1 + m_2 v_2$$

$$(0.1 \times 2) + (0.2 \times 1) = (0.1 \times 1.67) + (0.2 \times v_2)$$

$$\therefore 0.2 + 0.2 = 0.167 + 0.2v_2$$

$$0.4 - 0.167 = 0.2v_2$$

$$\frac{0.4 - 0.167}{0.2} = v_2$$

$$\therefore \frac{0.233}{0.2} = 1.165 \text{ m/s}$$

$\therefore$  The velocity of the second object is 1.165 m/s.

### Questions from NCERT Textbook

#### Question 1

An object experiences a net zero external unbalanced force. Is it possible for the object to be travelling with a non-zero velocity? If yes, state the conditions that must be placed on the magnitude and direction of the velocity. If no, provide a reason.

**Answer:**

When an object experiences a net zero external unbalanced force, in accordance with second law of motion its acceleration is zero. If the object was initially in a state of motion, then in accordance with the first law of motion, the object will continue to move in same direction with same speed. It means that the object may be travelling with a non-zero velocity but the magnitude as well as direction of velocity must remain unchanged or constant throughout.

#### Question 2

When a carpet is beaten with a stick, dust comes out of it. Explain.

**Answer:**

The carpet with dust is in state of rest. When it is beaten with a stick the carpet is set in motion, but the dust particles remain at rest. Due to inertia of rest the dust particles retain their position of rest and falls down due to gravity.

#### Question 3

Why is it advised to tie any luggage kept on the roof of a bus with a rope?

**Answer:**

In moving vehicle like bus, the motion is not uniform, the speed of vehicle varies and it may apply brake suddenly or takes sudden turn. The luggage will resist any change in its state of rest or motion, due to inertia and this luggage has the tendency to fall sideways, forward or backward. To avoid the fall of the luggage, it is tied with the rope.

#### Question 4

A batsman hits a cricket ball which then rolls on a level ground. After covering a short distance, the ball comes to rest. The ball slows to a stop because

- The batsman did not hit the ball hard enough.
- Velocity is proportional to the force exerted on the ball.
- There is a force on the ball opposing the motion.
- There is no unbalanced force on the ball, so the ball would want to come to rest.

**Answer:**

- There is a force on the ball opposing the motion.

#### Question 5

A truck starts from rest and rolls down a hill with a constant acceleration. It travels a distance of 400 m in 20 s. Find its acceleration. Find the force acting on it if its mass is 7 tons (Hint: 1 tons = 1000 kg).

$$\begin{aligned} u &= 0 \text{ m/s} & m &= 7 \text{ tonnes} \\ s &= 400 \text{ m} & &= 7 \times 1000 \text{ kg} \\ t &= 20 \text{ s} & &= 7000 \text{ kg} \\ a &= ? \\ F &= ? \end{aligned}$$

$$s = ut + \frac{1}{2}at^2$$

$$\begin{aligned} 400 &= (0 \times 20) + \frac{1}{2}a(20)^2 \\ &= \frac{400 \times 2}{(20)^2} = a & \therefore a &= 2 \text{ m/s}^2 \end{aligned}$$

$$\begin{aligned} \text{Force} \rightarrow F &= ma \\ &= 7000 \times 2 = 14000 \text{ N} \end{aligned}$$

**Question 6**

A stone of 1kg is thrown with a velocity of 20 ms<sup>-1</sup> across the frozen surface of a lake and comes to rest after travelling a distance of 50 m. What is the force of friction between the stone and the ice?

**Answer:**

$$\begin{aligned} m &= 1 \text{ kg} \\ u &= 20 \text{ m/s} & v^2 - u^2 &= 2as \\ s &= 50 \text{ m} & (0)^2 - (20)^2 &= 2a(50) \\ v &= 0 & \therefore -400 &= 100a \\ F &= ? & \therefore a &= \frac{-400}{100} = -4 \text{ m/s}^2 \\ a &= ? \end{aligned}$$

$$\begin{aligned} \text{Force of friction, } F &= m \times a \\ &= 1 \text{ kg} \times -4 \text{ m/s}^2 \\ &= -4 \text{ N} \end{aligned}$$

**Question 7**

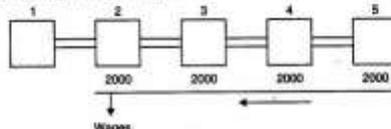
40000 kg engine pulls a train of 5 wagons, each of 2000 kg, along a horizontal track. If the engine exerts a force of 40000 N and the track offers a friction force of 5000 N, then calculate:

**Answer:**

(a) The net accelerating force = Force exerted by the engine - friction force  
 $= 40000 \text{ N} - 5000 \text{ N}$   
 $= 35000 \text{ N}$

(b) The acceleration of the train (a) = ?  
 $F = 35000 \text{ N}$   
 Mass of 5 wagons pulled by engine =  $5 \times 2000$   
 $= 10000 \text{ kg}$   
 $F = ma$   
 $35000 = 10000 \times a$   
 $a = \frac{35000}{10000} = 3.5 \text{ m/s}^2$

(c) The force of wagon 1 on wagon 2



Mass of wagon 2  $\rightarrow (2000 \times 4)$   
 $a = 3.5 \text{ m/s}^2$   
 $F = ma$   
 $= 8000 \times 3.5$   
 $= 28000 \text{ N}$

**Question 9**

What is the momentum of an object of mass m, moving with a velocity v?

- (a) mv                      (b) mv                      (c) 1/2 mv                      (d) 2.5mv

**Answer:**

- (d) mv

**Question 10**

Using a horizontal force of 200 N, we intend to move a wooden cabinet across a floor at a constant velocity. What is the friction force that will be exerted on the cabinet?

**Answer:**

As the wooden cabinet moves across the floor at a constant velocity and the force applied is 200 N. Hence the frictional force that will be exerted on the cabinet will be less than 200 N.

**Question 12**

According to the third law of motion when we push on an object, the object pushes back on us with an equal and opposite force. If the object is a massive truck parked along the roadside, it will probably not move. A student justifies this by answering that the two opposite and equal forces cancel each other. Comment on this logic and explain why the truck does not move.

**Answer:**

The mass of truck is too large and hence its inertia is too high. The small force exerted on the truck cannot move it and the truck remains at rest. For the truck to attain motion, an external large amount of unbalanced force needs to be exerted on it.

**Question 13**

A hockey ball of mass 200 g travelling at 10 ms is struck by a hockey stick so as to return it along its original path with a velocity at 5 ms . Calculate the change of momentum occurred in the motion of the hockey ball by the force applied by the hockey stick.

**Answer:**

**Question 17**

Akhtar, Kiran and Rahul were riding in a motorcar that was moving with a high velocity on an expressway when an insect hit the windshield and got stuck on the windscreen. Akhtar and Kiran started pondering over the situation. Kiran suggested that the insect suffered a greater change in momentum as compared to the change in momentum of the motorcar (because the change in the velocity of insect was much more than that of the motorcar). Akhtar said that since the motorcar was moving with a larger velocity, it exerted a larger force on the insect. And as a result the insect died. Rahul while putting an entirely new explanation said that both the motorcar and the insect experienced the same force and a change in their momentum. Comment on these suggestions.

**Answer:**

Rahul gave the correct reasoning and explanation that both the motorcar and the insect experienced the same force and a change in their momentum. As per the law of conservation of momentum.

When 2 bodies collide:

Initial momentum before collision = Final momentum after collision

$$M_1 u_1 + m_2 u_2 = m_1 v_1 + m_2 v_2$$

The equal force is exerted on both the bodies but, because the mass of insect is very small it will suffer greater change in velocity.

## **(Biology)**

### **DIVERSITY IN LIVING ORGANISMS**

#### **Q1: Why do we classify organisms?**

Ans: There are diverse forms of life on earth. On one hand we have microscopic bacteria of a few micrometers in size. While on the other hand we have blue whales & red wood trees of California of 30 meters and 100m respectively. Some pine trees live for thousands of years, while insects like mosquitoes die within a few days. Life also ranges from colorless worms to brightly coloured birds and flowers.

This bewildering variety of life around us has evolved over millions of years ago, but we do not have few minutes to understand all these living organisms. Therefore we classify organisms by looking for similarities among them which allows us to put them into different classes and study them as groups as a whole. Thus classification makes the study of living organisms easy and convenient.

#### **Q2: What is taxonomy?**

Ans: The branch of science that deals with the identification, nomenclature and classification of organisms, following certain rules or principles. Carlus Linnaeus (1707-1778) a Swedish scientist is called the father of taxonomy.

#### **Q3: What is meant by the term characteristics? How are the basic used in classifications of organisms.**

Ans: Characteristics refer to a particular form or a particular function. The following are the major characteristics used in grouping of organisms.

- i. Cells are prokaryotic or eukaryotic: organisms may be grouped whether they possess prokaryotic or eukaryotic cells
- ii. Cells occur singly or in clusters: organisms can be grouped either as unicellular e.g Amoeba or multicellular where different groups of cells carry out specialized functions.
- iii. Organisms are photosynthetic or take food from outside: Green plants perform photosynthesis and synthesize their own food (autotrophic) while as animals are dependent upon plants for their food (heterotrophs).
- iv. Organization of different body parts: Grouping of organisms may be done on the basis of body organization e.g. Plants possess stem, root and leaves. Similarly animals' possess specialized organs to perform different functions.

#### **Q4: Which do you think is a more basic characteristic feature for classifying organisms?**

- a) The place where they live
- b) The kind of cells they are made of why?

Ans: **(b)** The kind of cells they are made of is basic characteristic for classifying organisms. It is misleading to classify organisms on the basis of place where they live because many different kinds of organisms may live in the same habitat but they do not belong to the same group e.g. corals, whales, starfish; marine kelps differ with each other even though they live in oceans.

#### **Q5: On what basis are plants and animals put into different categories?**

Ans: Plants and animals are put into different categories on the basis of their mode of nutrition & their body organization. Plants are autotrophic & perform photosynthesis whereas animals are heterotrophic & get food from outside. Moreover plant cells have cell wall while as animal cells lack cell wall.

#### **Q6: How can evolution are related to classification?**

Ans: Changes in living organisms with time is called biological evolution. Most of the life forms that

we see today have arisen by an accumulation of changes in body design that allow the organism possessing them to survive better. Charles Darwin first described this idea in 1859 in his book “the Origin of Species”. When we connect the concept of evolution to classification, we find some groups of organisms which have ancient body designs. There are also some groups of organisms that have acquired their particular body design relatively recently those in the first group are called ‘primitive’ or ‘lower’ organisms, while the second group is called ‘advanced’ or higher organisms.

**Q7: Will advanced organisms be the same as complex organisms? Why?**

Ans: Yes, the complex organisms are comparatively more advanced as compared to simple organisms. It is because the complexity of organisms has increased over evolutionary time. The system of classification of organisms which is based on large number of characteristics & also reflects their evolutionary relationships is called Phylogenetic Classification.

**Q8: Describe the hierarchy of Classification group?**

Ans: While classifying, the organisms that closely resemble one another are placed in a group. These groups are further placed in larger groups on the basis of close similarities. The larger groups are again placed in still larger groups. The various grouping levels or ranks are known as categories each category has its specific name. There are seven major categories.

- 1) Species: This is the lowest category regarded as basic unit of classification. The individuals which resemble each other in morphology, breed among themselves but not with others & probably descended from the same ancestor belong to a species.
- 2) Genus: It is a group of closely related species having common ancestry.
- 3) Family: It represents closely related genera e.g. genus Felis of cats & the genus panther of lion, tiger, and leopard are placed in a family.
- 4) Order: An order is a group of closely related families e.g. family Felidae (of cats) & the family Canidae (of dogs) are same order because both have large canine teeth and are flesh eaters.
- 5) Class: A Class is a group of related orders.
- 6) Phylum/Division: Phylum (in case of animals) or division (in case of plants) is a group of related classes.
- 7) Kingdom: It is the highest category in biological classification. It is a group of Phyla (animals) or division (plants).

**Q9: Describe briefly the five kingdom classification.**

Ans: The system of classification was given by Robert H. Whittaker(1969).It was based on 4 factors.

- 1) Complexity of cell structure.
- 2) Body organization.
- 3) Mode and source of nutrition
- 4) Phylogenetic relationship.

Whittaker’s 5 kingdoms are:

- a) Kingdom: Monera (includes prokaryotic bacteria cyanobacteria, Actinomycetes, Archaeobacteria etc)
- b) Kingdom: Protista (includes unicellular eukaryotic organisms like unicellular algae slime molds & protozoa).
- c) Kingdom: Fungi (all fungi)
- d) Kingdom: Plantae (multicellular green plants)
- e) Kingdom: Animalia (multicellular animals)

**Q10: Discuss the kingdom Monera briefly.**

Ans: This kingdom comprises the Prokaryotic single celled organisms. They are all bacteria possessing ribosomes and naked circular DNA, called nucleoid. They lack membrane enclosed organelles such as mitochondria, lysosomes, endoplasmic reticulum and a true nucleus. They divide

by binary fission. Their fossils have been found in rock strata that are 3.5 billion years ago. The Monera are divided into two broad Sub kingdoms:

- I. **Archaeobacteria:** They represent the oldest form of life that has survived almost all the geological changes of earth. They derive the energy that they use for their metabolic activities from the oxidation of chemical source like ammonia, methane etc.
- II. **Eubacteria:** They are basically unicellular & morphologically least complex. They have varied cell shapes e.g. spherical, rod shaped (bacilli), cork-screw shaped (spirillum) or filamentous. They can be autotrophic or heterotrophic. Examples: Actinomyces, Cyanobacteria etc.
- III. **NOTE:** Archaeobacteria differ from eubacteria in following way:
  - a. Their cell wall lacks peptidoglycan found in all eubacteria.
  - b. The lipids of plasma membrane are branched which is not in the case of eubacteria.
  - c. They use bacteriorhodopsin as photosynthetic pigment instead of bacterial chlorophyll used by eubacteria.
  - d. All archaeobacteria live in extreme conditions where other kinds of bacteria could not survive.

### Q11: Describe Kingdom Protista.

Ans: The kingdom Protista includes all the eukaryotic unicellular species. Some are animal-like (protozoans) and others resemble plants (algal protists) while others demonstrate characteristics of fungi. The cells contain membrane bound nucleus, mitochondria, ER, Golgi bodies and locomotory structures like cilia and flagella.

- **Protozoans:** These are heterotrophic organisms found in every major habitat. Some are free living e.g. euglena whereas others exist as parasites within the bodies of other animals e.g. plasmodium. They lack cell wall & hence directly ingest food.
- **Algal protists:** Virtually all the members of this half-billion year old group are photosynthetic and occupy fresh or salt water habitats e.g., diatoms.
- **Fungi-like protists;** Their cell walls are made up of cellulose rather than chitin but they have holozoic mode of nutrition (absorb dissolved organic substances). They occur either as free living multinucleate mass of protoplasm (plasmodium) or aggregates of amoebae (pseudoplasmodium) e.g. slime moulds - Physarum.

### Q12: What are Fungi?

Ans: Fungi is a group of living organisms which can be eukaryotic, heterotrophic and multicellular in their body organization. They obtain their food by absorption rather than by ingestion. They secrete their digestive enzymes outside their bodies and then absorb the products of digestion produced outside. Most fungi possess cell walls made up of tough sugar called chitin (amino acid containing polysaccharides). They lack flagella and are restricted in terms of motility. Moulds & Mushrooms are examples of fungi. Many of them have the capacity to become multicellular organisms at certain stages in their lives. The fungi are at least 400 million years old.

Some fungal species live in permanent mutually dependent relationships with blue green algae (or cyano bacteria). Such relationships are called symbiotic associations. These symbiotic life forms are called Lichens. Examples of fungi: Aspergillus, Penicillium, Agaricus.

### Q13: Give the main divisions of the plant kingdom.

Ans: plant kingdom is classified into:

- |                |                |                 |
|----------------|----------------|-----------------|
| 1) Thallophyta | 2) Bryophyta   | 3) Pteridophyta |
| 4) Gymnosperms | 4) Angiosperms |                 |

**Q14: Give main features of Division Thallophyta.**

Ans:

1. They are commonly called algae.
2. Most primitive & simple plants with undifferentiated body in the form of thallus.
3. Mostly aquatic both marine and fresh water. Few terrestrial.
4. Photosynthetic pigment is generally green (Autrophic)
5. Mechanical & conducting tissue is absent.
6. Eg: Chara, Cladophora, Ulca.

**Q15: Give main features of Division Bryophyta.**

Ans: 1) Small multicellular land plants confined to damp & shady places. Also called Amphibians of the plant Kingdom.

- 2) Plant body undifferentiated into true root, stems & leaves. The body may be flat as liverworts (Riccia) or leafy eg, Marchantia.
- 3) Vascular system lacking.

**Q16: Give main features of Pteridophyta.**

Ans:

- Generally found at damp and shady places.
- Plant body differentiated into root, stem and leaves.
- Vascular system well developed.
- They have no flowers & do not produce seeds eg, Marselia, ferns, horse-tails.

**Q17: What are cryptogamae?**

Ans: The thallophytes, the bryophytes & the pteridophytes have naked embryos that are called spores. The reproductive organs of plants in all these groups are very inconspicuous and thus they are called cryptogamae which means "those with hidden reproductive organs"

**Q18: What are Phenerogams?**

Ans: The plants with well differentiated reproductive tissues that ultimately make seed are called Phanerogams. Seeds are the results of reproductive process. They consist of embryo along with stored food, which serves for the initial growth of the embryo during Germination. Phenerogams are further classified into gymnosperms (having naked seeds) and angiosperms (seeds enclosed in fruits).

**Q19: How are gymnosperms different from angiosperms?**

Ans:

Gymnosperms	Angiosperms
1. Vessels are absent in xylem & companions	1. Vessels and companion cells are present.
2. The Ovules are naked	2. The ovules are protected within the ovaries or carpels
3. Fruits are not formed & seeds are naked.	3. Fruits are formed & seeds are protected.

**Q20: Differentiate between monocots and dicot plants.**

Monocots	Dicots
<ol style="list-style-type: none"> <li>1. Seeds have only one cotyledon.</li> <li>2. Fibrous roots are present.</li> <li>3. Stems are false stems or hollow.</li> <li>4. Leaves are radical i.e arise directly from soil.</li> </ol> <p>They are sessile i.e without petiole having parallel venation.</p> <ol style="list-style-type: none"> <li>5. Flowers trimerous.</li> </ol>	<ol style="list-style-type: none"> <li>1. Seeds have two cotyledons.</li> <li>2. Tap roots are present.</li> <li>3. Stems are solid and strong.</li> <li>4. Leaves are petiolate, dorsventral with reticulate venation.</li> <li>5. Flowers pentamerous.</li> </ol>

**Q21: Discuss the main characteristics of Kingdom Animalia.**

Ans: The main characteristics of kingdom Animalia:

- These organisms are multicellular, eukaryotic and without chlorophyll.
- The cells possess no cell walls and plastids.
- Central vacuoles are absent but small vacuoles may occur.
- Most of them are free moving (except sponges and some coelenterates)
- Nutrition is primarily ingestive.
- Reproduction is generally sexual and haploid stage is represented only by gametes.
- Growth of organisms stops when the adult stage is reached.

**Q22: What are the main criteria responsible for classifying the animal kingdom?**

Ans: Some of the criteria for classifying animal kingdom are:

- 1) Structural organization of animal kingdom: There are 3 distinct levels of structural organization.
  - a) Cellular level: i.e, organisms may be unicellular or body formed by loose aggregated cells.
  - b) Tissue level: The body is made up of tissues of specialized cells.
  - c) Organ system level: The body has organized tissues, organs and systems.
- 2) Body Symmetry: Animals having their body parts arranged in such a manner that their body can be divided into 2 equal halves by one or more planes called symmetrical pattern. Those which cannot be divided into two equal parts by any plane are called asymmetrical.
- 3) Presence or absence of notochord: Some animals possess a skeletal rod called notochord at some stage in life. Those animals which possess it are called chordates (vertebrates) and those which lack notochords are grouped as non-chordates (invertebrates).
- 4) Presence or absence of body cavity(Coelom):
  - Animals having no cavity in the body except digestive tract are called acoelomate.
  - Animals having body cavity that does not arise from mesoderm are called pseudo coelomate.
  - The animals having true body cavity are called coelomate.
- 5) Germ Layers: Animals which have two germ layers in the early embryo are called diploblastic. The outer layer is called ectoderm & the inner layer is called endoderm.

**Q23: Discuss main features of Phylum Porifera.**

Ans: Porifera is derived from Greek word porus: Pore, fera to bear. They are commonly called sponges. The main features are:

- Non motile animals' attached to solid support.
- Holes present all over the body.
- Simplest multicellular animals. There are no tissues, organs or organ systems. They exhibit cellular level of organization.
- Body covered with hard layer or skeleton.
- Holes lead to internal body cavity/canal system that helps circulation of water along with food & oxygen. -Mainly marine  
Examples: Spongilla, Sycon, Euplectella.

**Q24: Discuss the main features of Coelenterate.**

Ans:

- They are all aquatic.
- The body is made up of 2 layers of cells: one makes up cells on outside of body & the other makes the inner lining of the body. They represent tissues level of organization.

- The body encloses a single cavity having single aperture or mouth which serves for both ingestion & egestion. Examples: Hydra (only fresh water coelenterate Obelia, Adamsia, Sea anemone

Some species live in colonies (corals) while others have a solitary lifestyle (hydra)

### Q25: What are platy helminthes?

Ans:

- 1) The body is bilaterally symmetrical & triploblastic. This allows some tissue differentiation.
- 2) The body is dorso-ventrally flattened. Hence they get the name flat worms.
- 3) They may be either free living (e.g, planaria) or parasitic (e.g, tape worm, liver fluke).

### Q26: What are nematodes/Aschelminthes?

Ans:

- 1) The body is bilaterally symmetrical & triploblastic. The body is cylindrical rather than flattened.
- 2) There are tissues but no real organs although a cavity is present between the body wall & the digestive tract. It is not a true coelom but is called pseudocoelom.
- 3) Animals are generally parasitic causing diseases. Very few are free living.
- 4) Examples: Ascaris, Wucheria

### Q27: Give main features of Phylum Annelida.

Ans:

- 1) Annelidia (Latin annelus=ring) Segmented worms.
- 2) Body is bilaterally symmetrical and triploblastic having a true body cavity allowing true organs to be packaged in the body. Thus annelids show organ level of body differentiation
- 3) The organ differentiation occurs in segmental fashion with segments lined up one after the other from head to tail (partitioned by septa).
- 4) They are found in fresh water, marine water as well as on land.
- 5) E.g.: leech, earthworm, Nereis.

### Q28: What are arthropods?

Ans: Arthropoda (GK: arthros=jointed; podos=foot)

- (1) Animals are bilaterally symmetrical & segmented.
- (2) The circulatory system is open, so the blood does not flow in well-defined blood vessels. The coelom is blood filled.
- (3) They have jointed appendages and probably form the largest group of animals.
- (4) Eg: Crab, scorpion, spider, housefly, prawn, butterfly.

### Q29: Write briefly Mollusca.

Ans: Mollusca (Latin mollusca=soft).

- (1) Body has bilateral symmetry & coelomic cavity is reduced. Segmentation is also less.
- (2) Body is soft, unsegmented without external appendages.
- (3) In most cases calcareous shell covers the body.
- (4) There is a foot used for locomotion.
- (5) Circulatory system is open & there are kidney like organs for excretion
- (6) Eg: chiton, Octopus, Unio, pila, limax.

### Q30: Write briefly about Echinoderm ata.

Ans: Echinodermata: (GK Echinus=hedgehog derma=skin)

- (i) The body covered all over by endo skeleton of calcareous spines.
- (ii) Body unsegmented having radial symmetry & triploblastic.
- (iii) Water driven tube system is used for locomotion.

- (iv) The shape of animals may be star-like cylindrical, melon-like or flowers-like or disc-like. They are exclusively marine animals. e.g., starfish, sea-cucumber, sea urchin.

**Q31: What is a notochord?**

Ans:

A notochord is a long rod-shaped like support structure that runs along the back of the animal separating the nervous tissue from the gut. It provides a place for muscles to attach for ease of movement. Protochordates may not have a proper notochord present at all stages in their lives or for the entire length of the animal e.g., balanoglossus, herdmania, Amphioxus.

**Q32: Explain how animals in Vertebrates are classified into further sub groups?**

Ans:

The animals in Vertebrate are classified into further sub-groups based on the following characteristics:

- i. The kind of skeleton (exo-or endo skeleton).
  - ii. The kind of respiratory organs.
  - iii. The method of reproduction.
- On the basis of above mentioned Characteristics the vertebrates are divided into following classes.
- I. Exoskeleton of scales, Endoskeleton of cartilage or bones, breathing through gills (Pisces).
  - II. Breathing through gills only in Larvae, Slimy skin (Amphibia).
  - III. Exoskeleton of feathers, lay eggs, flight possible (Aves).
  - IV. Exoskeleton of hair, external ears, gives birth to young ones (Mammals)

**Q33: What are vertebrates? What are their chief characteristics features?**

Ans:

Vertebrates are animals that have a true vertebral column & internal skeleton allowing a completely different distribution of muscle attachment points to be used for movement. They are bilaterally symmetrical, triploblastic, coelomic and segmented with complex differentiation of body tissues & organs.

**Exercises**

**Q1. What do you understand by binomial nomenclature?**

Ans: This is a system of scientific naming introduced by Carolus Linnaeus in 18<sup>th</sup> century. The scientific name of an organism is the result of the process of classification which puts it along with the organisms it is most related to. However when we name organisms, the whole hierarchy or groups are not included. He naming is limited to the name of genus & species. Certain conventions are followed while writing the scientific names:

- I. The name of the genus begins with a capital letter.
- II. The name of the species begins with a small letter.
- III. When printed, the scientific name is given in italics.
- IV. When written by hand, the genus name and the species name have to be underlined separately.eg,  
Homo Sapiens (Man)  
Pisum Sativum (pea)  
Pheretima Posthuma (earthworm)

**Q2: What are the advantages of classifying organisms?**

Ans:

1. Classification according to a definite plan facilitates their identification & makes the study convenient.
2. There are a vast number of organisms on earth whose study is not possible. Thus this study of a few representatives from each group gives broad idea of the life as a whole.

3. It gives information about the organisms which do not occur in one's own locality.
4. It reveals evolutionary trends by showing gradually increase in complexity of structure.

**Q3: How would you choose between two characteristics to be used for developing a hierarchy in classification?**

Ans:

Firstly we need which characteristics should be used as basis for making the broadest division. Then next set of characteristics for making sub groups must be picked up. This process must continue & each time new characteristics should be used. The characteristics that decide the broadest division among living organism should be independent of any other characteristics e.g., nature of the cell is used for broad classification. The characteristics in the next level should be dependent on the previous one that will decide the subsequent division of the group.

**Q4: How are the criteria for deciding divisions in plants different from the criteria for deciding the sub-groups among animals?**

Ans:

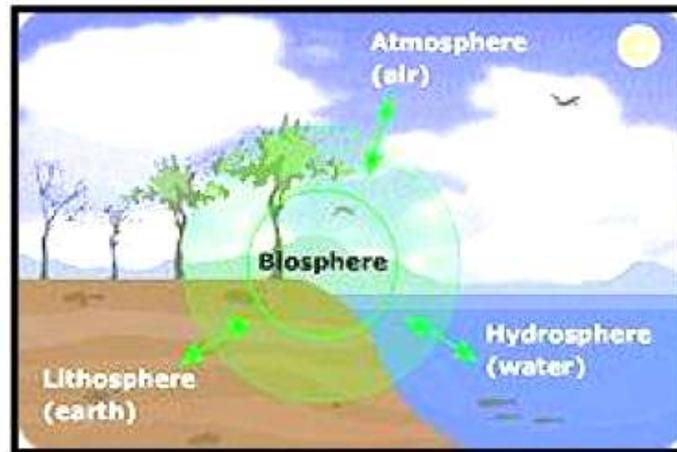
This is so because the basic body designs are different in the two divisions. The body designs of the two are based on the need to be autotrophic or heterotrophic. The other characteristics like presence or absence of skeleton etc. are used to make sub groups in animals.

OASIS Hr. Sec. Educational Institute

## **NATURAL RESOURCES**

The land, the water and the air are the resources on the Earth

### **The four main spheres of Earth:**



### **1. lithosphere 2. hydrosphere 3. atmosphere 4. biosphere**

The four spheres show how the four main components of Planet Earth form a complete system. These main components are land, air, water, and life. The names of each of these spheres come from Greek words that describe what they're made of.

**Lithosphere** is also known as Geosphere. 'Geo' means 'ground'. The outer crust of the Earth is called the lithosphere. Earth's lithosphere includes the crust and the uppermost mantle, which constitute the hard and rigid outer layer of the Earth. The lithosphere is the most rigid of Earth's layers.

**Hydrosphere**- 'hydro' means 'water,' the **hydrosphere** is composed of all of the water on or near the earth. This includes the oceans, rivers, lakes, and even the moisture in the air. The hydrosphere is found on the surface of Earth, but also extends down several miles below, as well as several miles up into the atmosphere (as water vapors). It is the only planet in the Solar System with a hydrological cycle. Hydrosphere makes up about three fourths of the earth's surface.

**Atmosphere**- 'atmo' means 'air'. The air that covers the whole of the Earth like a blanket is called the atmosphere.

**Biosphere**- 'bio' means 'life'. The life-supporting zone of the Earth where the atmosphere, the hydrosphere and the lithosphere interact and make life possible is known as the biosphere. Biosphere comprises of both biotic and abiotic components.



- Biotic components include all the living organisms.
- Abiotic components include air, water and the soil.

### **The Breath of Life: Air**

Air is a mixture of many gases like nitrogen, oxygen, carbon dioxide and water vapour. On Venus and Mars there is no life because carbon dioxide constitutes 95-97% of the atmosphere.

### **Carbon dioxide is produced in the atmosphere by following activities:**

- (i) Breakdown of glucose in presence of oxygen by organisms.
- (ii) Combustion of fuels.

### **Carbon dioxide is fixed in two ways:**

- (i) Green plants convert carbon dioxide into glucose by photosynthesis.
- (ii) Marine animals use carbonates dissolved in sea-water to make their shells.

### **THE ROLE OF THE ATMOSPHERE IN CLIMATE CONTROL**

The air is a bad conductor of heat. The atmosphere (envelope of air that surrounds the earth) acts as a protective blanket for the living organisms to exist in the following way:

It keeps the average temperature of the earth fairly steady during the day and even during the course of the whole year. The atmosphere does so by preventing the sudden increase in temperature during the daylight hours. Further, during the night, it slows down the escape of heat into the outer space. In contrast, the situation on the moon is quite different which is about the same distance from the sun that the earth is. Moon has no atmosphere and the temperature on the surface of the moon ranges from  $-190^{\circ}\text{C}$  to  $110^{\circ}\text{C}$ .

### **THE MOVEMENT OF AIR: WINDS**

Moving air is called wind. Air moves from high pressure area to a low pressure area. Motion of wind is the result of two changes taking place in the atmosphere-

- i) Heating of air
- ii) Formation of water vapour. Water vapour is formed due to the heating of water bodies and the activities of living organisms.



The atmosphere can be heated from below by the radiation that is reflected back or re-radiated by the land or water bodies. On being heated, convection currents are set up in the air. When air is heated by radiation from the heated land or water, it rises. But since land gets heated faster than water, the air over land would also be heated faster than the air over water bodies and starts rising. As this air rises, a region of low pressure is created and air over the sea moves into this area of low pressure. The movement of air from one region to the other creates winds.

Various other factors also influence these winds –

- i) The rotation of the Earth
- ii) The presence of mountain ranges in the paths of the wind.

### **Formation of rain:**

When water bodies are heated during the day, a large amount of water evaporates and goes into the air. Some amount of water vapour also gets into the atmosphere because of various biological activities. This air also gets heated. The hot air rises up carrying the water vapour with it. As the air rises, it expands and cools. This cooling causes the water vapour in the air to condense in the form of tiny droplets. This condensation of water is facilitated if some particles could act as the 'nucleus' for these drops to form around. Normally dust and other suspended particles in the air perform this function. Once the water droplets are formed, they grow bigger by the 'condensation' of these water droplets. When the drops have grown big and heavy, they fall down in the form of rain. Sometimes, when the temperature of air is low enough, precipitation may occur in the form of snow, sleet or hail.

Rainfall patterns are decided by the prevailing wind patterns. In large parts of India, rains are mostly brought by the southwest or north-east monsoons. We have also heard weather reports that say 'depressions' in the Bay of Bengal have caused rains in some areas

### **Air pollution**

An undesirable change in the physical, chemical or biological characteristics of the air making it harmful for the living organisms (including man) is termed air pollution. In other words, addition of unwanted and harmful substances in the air or increase in the quantities of constants of air beyond the normal level that affects the living organisms is called air pollution. Agents or substances that pollute the air are called air pollutants.

### Indicators of air pollution:

Presence or absence of certain organisms indicates air pollution. Organisms called lichens are found to be very sensitive to the levels of contaminants like sulphur dioxide in the air. Lichens can be commonly found growing on the barks of trees as a thin greenish-white crust. Lichen vegetation and mosses gets completely destroyed when the level of  $\text{SO}_2$  increases. Therefore, lichens are not found in cities and towns having vehicular pollution.

### Water

Water is called the fluid of life. 75% of the earth's surface is covered by water, 97% of which forms oceans and only 3% forms fresh water. Water exists in solid, liquid and gaseous forms. It occurs in atmosphere, on land surface as well as underground.

### Composition of water:

Water is composed of hydrogen and oxygen. Its chemical formula is  $\text{H}_2\text{O}$ .

**TYPES OF WATER RESOURCES:** - Water resources can be classified into two types

- i) Fresh water resources- Fresh water is found frozen in the ice-caps at the two poles and on snow covered mountains. The underground water and the water in rivers, lakes and ponds are also fresh.
- ii) Salt water resources- Most of the water on Earth's surface is found in seas and oceans and is saline

### IMPORTANCE OF WATER:-

The importance of water to the life of plants can be emphasized best by enlisting its functions:

- Water is the main constituent of protoplasm.
- It is the solvent through which mineral salts are transported from one part of the plant to the other.
- Various metabolic reactions take place in a medium containing water.
- It acts as a reactant in numerous metabolic reactions.
- During photosynthesis, water releases oxygen.
- Turgidity of the growing cells is maintained with water.

- Various movements of plant organs like movements in sensitive plant (touch-me-not) are controlled by water.
- The growth of the cells during elongation phase is mainly dependent on absorption of water.
- Metabolic end product of respiration is water.
- Places having plenty of water have more biodiversity.

### **Water is important to living organisms because:**

- i) All cellular processes require an aqueous medium.
- ii) Dissolved substances are needed for body reactions as well as for transportation. Osmoregulation is carried out by all organisms to sustain life.

### **Water pollution:**



Water pollution: The addition of undesirable substances to water and removal of desirable substances from water is called water pollution.

The main causes of water pollution are as follows:

- (i) Addition of harmful substances to water
- (ii) Removal of desirable substances from water
- (iii) Change in water temperature.

### i) Addition of harmful substances to water

- Chemical wastes from industries. E.g., Mercury salt from paper industries.
- Sewage and wastes from houses.
- Pesticides and fertilizers
- Disease carrying organisms from industries. E.g., cholera

### ii) Removal of desirable substances from water

Dissolved oxygen is used by the animals and plants that live in water. Any change that reduces the amount of this dissolved oxygen would adversely affect these aquatic organisms. Other nutrients could also be depleted from the water bodies.

### iii) Change in temperature

Aquatic organisms are used to a certain range of temperature in the water-body where they live, and a sudden marked change in this temperature would be dangerous for them or affect their breeding. The eggs and larvae of various animals are particularly susceptible to temperature changes.

### Mineral riches in the soil:

Soil is an important resource that decides the diversity of life in an area. The outermost layer of our Earth is called the crust and the minerals found in this layer supply a variety of nutrients to life-forms. Over long periods of time, thousands and millions of years, the rocks at or near the surface of the Earth are broken down by various physical, chemical and some biological processes. The end product of this breaking down is the fine particles of soil.

**Soil** is a mixture. It is the portion of earth surface consisting of various components like small particles of rock (of different sizes, bits of decayed living organisms which are called **humus**, various forms of microscopic life, air and water.

### The factors or processes that make soil:

- **The Sun:** The Sun heats up rocks during the day so that they expand. At night, these rocks cool down and contract. Since all parts of the rock do not expand and contract at the same rate, this results in the formation of cracks and ultimately the huge rocks break up into smaller pieces.



• **Water:** Water helps in the formation of soil in two ways. One, water could get into the cracks in the rocks formed due to uneven heating by the Sun. If this water later freezes, it would cause the cracks to widen. Two, flowing water wears away even hard rock over long periods of time. Fast flowing water often carries big and small particles of rock downstream. These rocks rub against other rocks and the resultant abrasion causes the rocks to wear down into smaller and smaller particles. The water then takes these particles along with it and deposits it further down its path. Soil is thus found in places far away from its parent rock.

• **Wind:** In a process similar to the way in which water rubs against rocks and wears them down, strong winds also erode rocks down. The wind also carries sand from one place to the other like water does.

• **Living organisms** also influence the formation of soil. The lichen that we read about earlier also grows on the surface of rocks. While growing, they release certain substances that cause the rock surface to powder down and form a thin layer of soil. Other small plants like moss are able to grow on this surface now and they cause the rock to break up further. The roots of big trees sometimes go into cracks in the rocks and as the roots grow bigger, the crack is forced bigger.

Type of soil is decided by the average size of particles found in it. It contains four different particles of varying sizes namely-

- i) Gravel
- ii) Sand
- iii) Silt
- iv) Clay.

**Quality of soil** is determined by the content of humus and microscopic organisms found in it.

The mineral nutrients that are found in a particular soil depend on the rocks it was formed from.

Humus is a major factor in deciding the soil structure because it causes the soil to become more porous and allows water and air to penetrate deep underground.

### **Factors that decide the type of plant that will thrive on a particular soil:**

- The nutrient content of a soil,
- The amount of humus present in it

-The depth of the soil

**Top soil:** the topmost layer of the soil that contains humus and living organisms in addition to the soil particles is called the topsoil. The quality of the topsoil is an important factor that decides biodiversity in that area.

**Soil pollution:**



Removal of useful components from the soil and addition of harmful substances, which adversely affect the fertility of the soil and kill micro-organisms living in it, are called soil pollution. Fertilizers and pesticides destroy the soil structure. Mosses or Bryophytes are indicator of soil pollution.

**Soil erosion:**



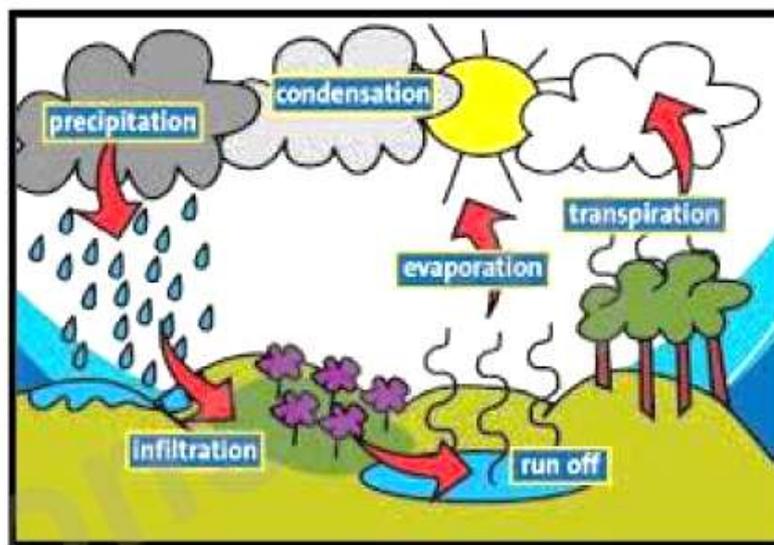
Removal of topmost layer of soil by wind, flowing water or other activities is called soil erosion. Roots of plants prevent soil erosion by firmly holding the soil particles.

### **Biogeochemical cycle:**

A biogeochemical cycle is the flow of matter from non-living environment to the living organisms and its return back to the non-living environment.

### **THE WATER-CYCLE**

The whole process in which water evaporates and falls on the land as rain and later flows back into the sea via rivers is known as the water-cycle.



The water cycle in nature is also known as hydrological cycle. The various steps involved in the water cycle in the biosphere are:

#### **1. Evaporation:**

Evaporation is when the sun heats up water in seas and oceans and turns it into water vapour or steam. The Sun's heat provides energy to evaporate water from the Earth's surface (oceans, lakes, etc.) and form water vapour which being lighter than air rises up and goes into the atmosphere.

**2. Transpiration** -The plants continuously absorb water from the soil through their roots. Some of this water is utilized by the plants for photosynthesis. The excess water in the body of plants is added to the atmosphere in the form of water vapour from the leaves of

plants through the process of transpiration. The water vapours produced also goes into the atmosphere. Transpiration is the process by which plants and trees lose water out of their leaves into the air.

3. During the process of respiration in living plants and during the decay of dead plants water vapour is produced which also goes into the atmosphere.

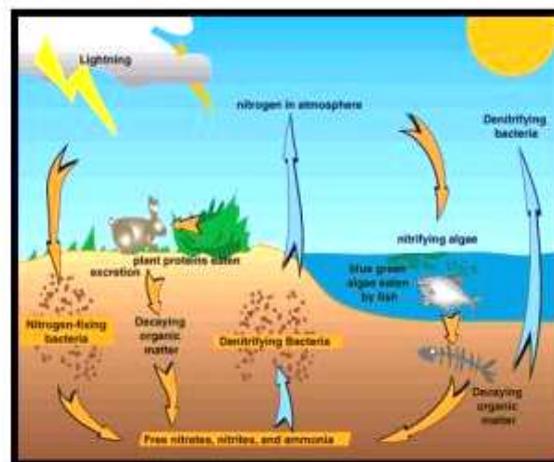
4. **Condensation**- As the water vapour rises up, it gets cooled and it eventually condenses back into tiny droplets of liquid water.

5. These droplets are small enough to float in the air and eventually collect together to make a cloud. These clouds can be blown by the wind to move water to different parts of the earth.

6. **Precipitation**-As more and more water droplets form, they will join together to form bigger water drops in the clouds. These drops become too heavy to stay in the air and will fall to the earth as rain. In case of extremely cold weather, the water might freeze and fall as hail or snow. Any water that falls from the sky-rain, snow, sleet or hail is called precipitation.

7. **Percolation and absorption**: Some of the precipitation soaks into the ground. Some of the underground water percolates through the rock or clay layers to reach the underground water. This is called groundwater. On land the water is used by the plants, crops and trees to grow. But most of the water flows downhill as runoff (above ground or underground), eventually returning to the seas as slightly salty water. In this way water was taken from the earth, returns to the earth and the water cycle is completed.

### **NITROGEN CYCLE:-**



Nitrogen makes up seventy-eight percent of the atmosphere, but most organisms cannot use this form of nitrogen, and must have the fixed form. Nitrogen is also a part of many molecules essential to life like proteins, nucleic acids (DNA and RNA) and some vitamins. Nitrogen is found in other biologically important compounds such as alkaloids and urea too. Nitrogen is thus an essential nutrient for all life-forms and life would be simple if all these life-forms could use the atmospheric nitrogen directly. The nitrogen cycle produces the fixed form of nitrogen these organisms need.

### Step 1-

#### Nitrogen Fixation-

**By lightning-** During lightning, the high temperatures and pressures created in the air convert nitrogen into oxides of nitrogen. These oxides dissolve in water to give nitric and nitrous acids and fall on land along with rain. These are then utilised by various lifeforms.

**By bacteria-** Molecular nitrogen is converted into nitrates and nitrites by free living bacteria or the bacteria like Rhizobium present in the root nodules of legumes. Special bacteria convert the nitrogen gas ( $N_2$ ) to ammonia ( $NH_3$ ) which the plants can use.

### Step 2-

**Nitrification-** Nitrification is the process which converts the ammonia into nitrite ions and then into nitrates which the plants can take in as nutrients. Special kinds of bacteria are involved in this process which occurs naturally in the environment. The bacteria nitrosomonas and nitrococcus convert the ammonia into nitrite and then nitrobacter convert the nitrites into nitrates by oxidizing  $NO_2$  to  $NO_3$ . All these bacteria reside in soil and are called as nitrifying bacteria. These soluble nitrates dissolve in soil water and are absorbed by the roots of plants. The nitrates and nitrites are used by plants to make amino acids which are then used to make plant proteins. The plant may be eaten by an animal, and its biomass used to produce **animal protein**.

### Step 3-

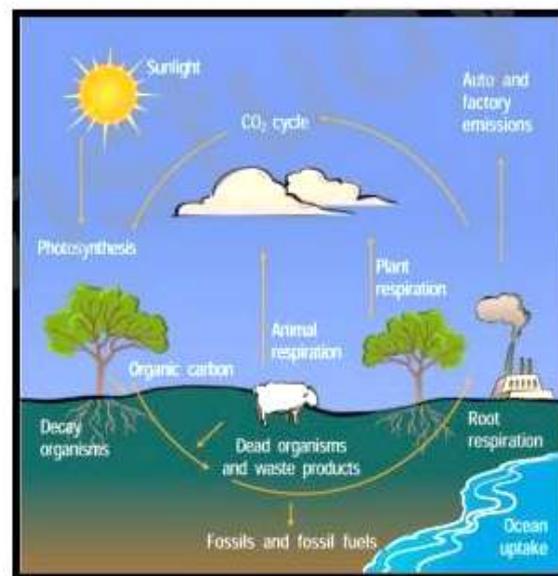
**Ammonification-** When an animal or plant dies they release wastes from their bodies, nitrogen is released in the organic form. This organic nitrogen is converted into ammonium by fungi and bacteria through the process Ammonification. After all of the living organisms have used the nitrogen, decomposer bacteria convert the nitrogen-rich

waste compounds into simpler ones. Urea and egested material is broken down by decomposers. This results in nitrogen being returned to the soil as **ammonia**. Decomposers also break down the bodies of dead organisms resulting in nitrogen being returned to the soil as ammonia.

#### Step 4-

**Denitrification-** Denitrification is the final step in which the simple nitrogen compounds are converted back into nitrogen gas ( $N_2$ ), which is then released back into the atmosphere to begin the cycle again. When the ammonia is converted back into inert nitrogen, the process is called as denitrification. Bacteria are involved in this process which takes place in anaerobic conditions. Places like deep soils and deep water are the places without oxygen. Pseudomonas and Clostridium are responsible for the step of denitrification. These bacteria can also live in the places where there is availability of oxygen.

#### CARBON CYCLE:



Carbon is found in various forms on the Earth. It occurs in the elemental form as diamonds and graphite. In the combined state, it is found as carbon dioxide in the atmosphere, as carbonate and hydrogen carbonate salts in various minerals, while all life-forms are based on carbon-containing molecules like proteins, carbohydrates, fats, nitrogen-cycle in nature nucleic acids and vitamins. The endoskeletons and exoskeletons of various animals are also formed from carbonate salts.

The carbon cycle is the process by which carbon moves from the atmosphere into the Earth and its organisms and then back again.

Carbon enters the atmosphere as **carbon dioxide** from respiration (breathing) and combustion (burning)

### Photosynthesis

Carbon is incorporated into life-forms through the basic process of photosynthesis which is performed in the presence of Sunlight by all life-forms that contain chlorophyll. This process converts carbon dioxide from the atmosphere or dissolved in water into glucose molecules. Plants store and use this sugar to grow and to reproduce. Thus, plants help to remove carbon from the atmosphere. When plants are eaten by animals, their carbon is passed on to those animals. Since animals cannot make their own food, they must get their carbon either directly by eating plants or indirectly by eating animals that have eaten plants.

At the same time that some processes of nature are removing carbon from the air, other processes are adding more carbon to the air.

**Respiration:** Respiration is the next step in the cycle, and it occurs in plants, animals, and even decomposers. When plants and animals respire, glucose stored in the plants and animals are broken down to release  $\text{CO}_2$ , water and energy. Through this process,  $\text{CO}_2$  is released back into the atmosphere.

**Decomposition:** As plants and animals die and decay or decompose (or when animals defecate and their waste materials decompose), the carbon found in them are released to the environment. When the decaying matter bodies get buried under the ground and are subjected to high pressures and other physical and chemical changes for millions of years, they change into fossil fuels.

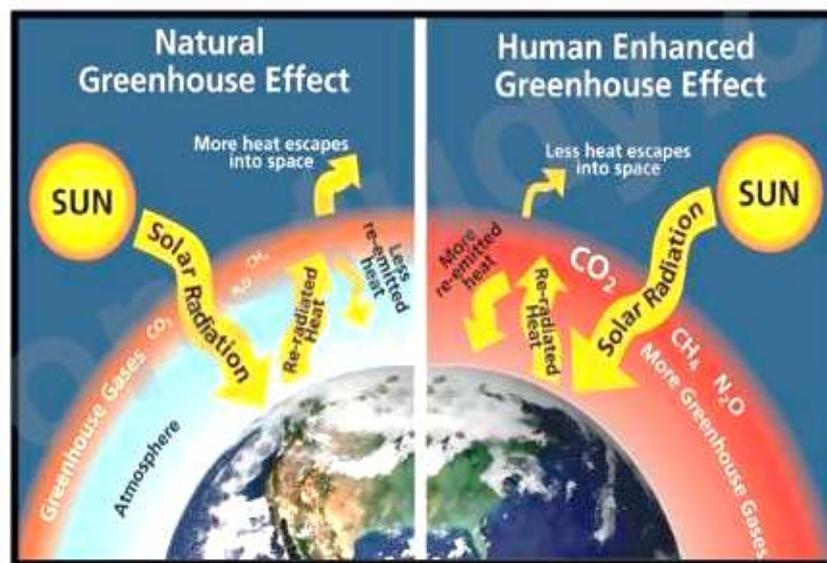
**Combustion:** When the fossil fuels are burnt to provide energy for various needs like heating, cooking, transportation and industrial processes most of the carbon rapidly enters the atmosphere as carbon dioxide gas. In fact, the percentage of carbon dioxide in the atmosphere is said to have doubled since the industrial revolution when human beings started burning fossil fuels on a very large scale.

**Movement of carbon from the atmosphere to the oceans:** The oceans, and other water bodies, soak up about a quarter of the carbon dioxide gas from the atmosphere. However, this uptake process is slow. Similarly, under normal conditions, the release of carbon dioxide back into the atmosphere from the ocean is also at a very low rate.

Through these steps the total amount of carbon in the environment remains constant. There is no formation or demolition of carbon in this process and it only involves the movement of this element from one form to another.

## THE GREENHOUSE EFFECT

What is the greenhouse effect?



The definition of the greenhouse effect is the warming that results when heat is trapped. This process is similar to how the glass house (known as the greenhouse) works. The glass house traps the sun's heat energy within and maintains the temperature optimally warm for plants to grow.

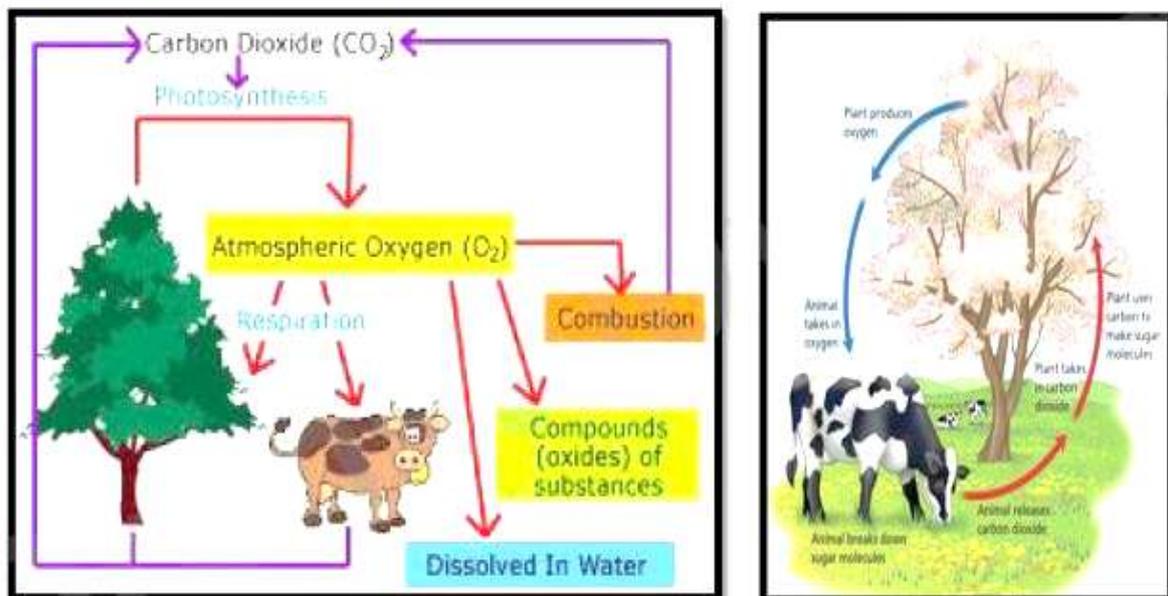
Some gases prevent the escape of heat from the Earth. An increase in the percentage of such gases in the atmosphere would cause the average temperatures to increase worldwide and this is called the greenhouse effect. Carbon dioxide is one of the greenhouse gases. This means that it traps heat and prevents it from escaping from Earth. As a result, this trapped gas leads to a global temperature rise, a natural phenomenon

known as the greenhouse effect, which can have disastrous effects on Earth's environment.

## OXYGEN CYCLE

Oxygen is an important element to life on Earth. It is the most common element of the human body. It makes up about 65% of the mass of the human body. Most of this is in the form of water (H<sub>2</sub>O). Oxygen also makes up about 30% of the Earth and 20% of the atmosphere.

### The Oxygen Cycle



Oxygen is constantly being used and created by different processes on planet Earth. All of these processes together make up the oxygen cycle. The oxygen cycle is interconnected with the carbon cycle.

### Processes That Use Oxygen

- **Respiration:**

Animals take in simple sugars (glucose) and oxygen and release carbon dioxide, water and energy.

- **Decomposition:** Is a minor part of the Carbon/Oxygen cycle

Decomposition is when any **organic** matter (plants, animals) **breaks down chemically** into all the simple elements that they are made of and these elements return back to the environment.

As plants and animals die and decay or decompose (or when animals defecate and their waste materials decompose), the **carbon, oxygen, nitrogen, water, calcium** etc. return to the soil and air during decomposition.

### Processes That Produce Oxygen

- **Photosynthesis:**

Green plants/trees take in Carbon Dioxide and water using the chlorophyll in their leaves and energy from the sun they release Oxygen, sugar and water vapor.

- Sunlight - Some oxygen is produced when sunlight reacts with water vapor in the atmosphere.

### Ozone Layer



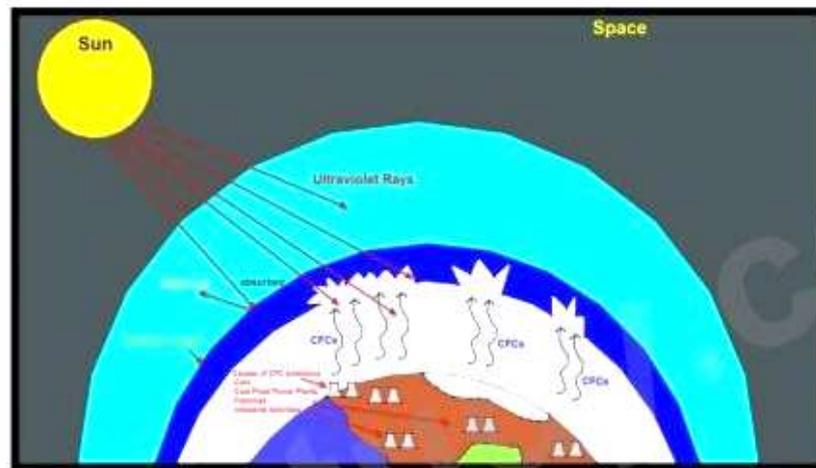
Elemental oxygen is normally found in the form of a diatomic molecule. However, in the upper reaches of the atmosphere, a molecule containing three atoms of oxygen is found. This would mean a formula of  $O_3$  and this is called ozone.

This is simply a layer in the stratosphere containing a relatively high concentration of ozone. The ozone layer is mainly found in the lower portion of the stratosphere from

approximately 20 to 30 kilometers (12 to 19 mi) above earth, though the thickness varies seasonally and geographically.

Ozone is poisonous and it is not stable nearer to the Earth's surface. But, it performs an essential function where it is found. It absorbs harmful radiations from the Sun. This prevents those harmful radiations from reaching the surface of the Earth where they may damage many forms of life.

### Depletion of ozone layer:



Ozone layer depletion is simply the reduction of the amount of ozone in the stratosphere. Ozone depletion is caused because of one the industries that manufacture things like insulating foams, solvents, soaps, cooling things like Air Conditioners, and Refrigerators that use chlorofluorocarbons (CFCs). Depletion begins when CFC's get into the stratosphere. Ultra violet radiation from the sun breaks up these CFCs. The breaking up action releases Chlorine atoms. Chlorine atoms react with Ozone, starting a chemical cycle that destroys the good ozone in that area. One chlorine atom can break apart more than 100,000 ozone molecules.

## انفارمیشن ٹیکنالوجی

س ۱۔ ابتدائی دور کے انسان کی زندگی کیسی تھی؟

ج۔ ابتدائی دور کے انسان کی زندگی بے خبری اور لاعلمی کی زندگی تھی۔ وہ دیوانوں کی طرح ادھر سے ادھر پھرتا تھا۔ اس کیفیت میں ذرا سی آہٹ حیوانی چیخ یا دھما کے سے اس کے پورے بدن میں سنسنی دوڑ جاتی تھی۔ اگر کچھ معمول سے ہٹ کر ہوتا تو وہ آنکھیں پھاڑ پھاڑ کر دیکھتا تھا۔ انہی باتوں نے اس کی زندگی میں تغیر لایا۔

س ۲۔ آج کے عہد کو انفارمیشن ٹیکنالوجی کی صدی کیوں کہا گیا ہے؟

ج۔ آج کے عہد کو انفارمیشن ٹیکنالوجی کی صدی جدید ٹیکنالوجی کی بدولت کہا گیا ہے جس کی بدولت چوبیس گھنٹے کے اندر سات سمندر پار کی خبر انسان کو مل جاتی ہے۔ پیغامات پلک جھپکتے ہی ادھر سے ادھر پہنچ جاتے ہیں۔ فوری ترسیل کے اس عمل کی بدولت آج کے عہد کو انفارمیشن ٹیکنالوجی کا دور کہا گیا ہے۔

س ۳۔ ہماری زندگی میں ٹیلی ویژن کی کیا اہمیت ہے؟

ج۔ ہماری زندگی کے لئے ٹیلی ویژن ایک ضرورت بن گئی ہے۔ اس کی متعدد پیشکشیں بدولت خبریں سائنسی، سیاسی، تفریح، سماج، اقتصادی جانکاری ہمیں حاصل ہوتی ہے۔ اس لئے ہم آج اس کے بغیر اپنی زندگی کا تصور بھی نہیں کر سکتے۔

س۔ کمپیوٹر نے ہماری زندگی کے ہر شعبہ کو کس طرح متاثر کیا ہے؟ تفصیل لکھیے۔

ج۔ کمپیوٹر ایسا مشینی آلہ ہے جو عقل سے عاری ہے مگر عمل میں ہزاروں جنوں پر بھاری ہے۔ اس کا بنیادی مقصد ہر طرح کی معلومات کو یکجا کر کے ترتیب دینا ہے۔ اس لیے اس نے ہماری زندگی کے ہر شعبے کو متاثر کیا ہے۔

س ۵۔ انٹرنیٹ کے کیا فائدے ہیں؟

ج۔ پوری دنیا بھر میں پھیلے ہوئے کمپیوٹر کے باہمی جڑے رہنے کا سسٹم ہے۔ انٹرنیٹ کا سب سے بڑا فائدہ یہ ہے کہ گھر بیٹھے دینا بھر کی معلومات کم وقت اور کم خرچ میں حاصل ہو سکتی ہے۔ اس کے ذریعے ہم دنیا بھر میں پھیلے ہوئے اپنے عزیز و اقارب سے بات چیت کر سکتے ہیں۔ تعلیم کا روبرو اور بیماری سے متعلق مشورے حاصل کر سکتے ہیں، سفر اور طریقہ سفر کے لئے انٹرنیٹ ایک رہبر کا کام دیتا ہے۔ کمپیوٹر سے ہم دنیا بھر کی جانکاری حاصل کر سکتے ہیں۔

س ۶۔ ای۔ میل سے کیا مراد ہے؟

ج۔ ای۔ میل الیکٹرانک میل کا مختصر نام ہے۔ اس سے مراد ہے برقی تاروں کے ذریعے پیغام رسانی ہے۔

## (اُردو کہاں پیدا ہوئی)

۱۔ اُردو اور کشمیری میں شامل چند مشترکہ الفاظ اپنی کاپی پر لکھیے؟

ج۔ اُردو اور کشمیری میں شامل مشترکہ الفاظ لا تعداد ہیں مگر یہاں چند کو ہی درج کر رہے ہیں۔ قلم، کتاب، چائے، عینک، کاپی، آزاد، سڑک  
زمیں، آسمان وغیرہ وغیرہ۔

۲۔ سوچ کر بتائیے کہ درج ذیل زبانیں کہاں بولی جاتی ہیں؟ کشمیری، ڈوگری، ملیالم، کنٹر، تامل، پنجابی، سندھی۔

ج۔ درج ذیل زبانیں ان علاقوں میں بولی جاتی ہیں:

زبانیں	علاقے
۱۔ کشمیری	کشمیر میں بولی جاتی ہے۔
۲۔ ڈوگری	جموں صوبہ میں بولی جاتی ہے۔
۳۔ ملیالم	کیرالہ میں بولی جاتی ہے۔
۴۔ کنٹر	یہ کرناٹک کی زبان ہے۔
۵۔ تامل	تامل ناڈو کی زبان ہے۔
۶۔ پنجابی	پنجاب میں بولی جاتی ہے۔
۷۔ سندھی	علاقہ سندھ کی زبان ہے۔

۳۔ برصغیر ہندوپاک کو زبانوں کا عجائب گھر کیوں کہا گیا ہے؟

ج۔ برصغیر ہندوپاک کو زبانوں کا عجائب خانہ اسلئے کہا گیا ہے کیونکہ یہاں چھوٹی بڑی لا تعداد زبانیں بولی جاتی ہیں۔ یہاں مختلف علاقوں میں زبانیں بولی جاتی ہیں۔ جسمیں کچھ قدیم ہیں اور کچھ جدید اور ہر زبان دوسری زبان کے اثر سے متاثر ہے اور کچھ الفاظ اپنے اندر جذب کر لیتی ہے۔ اسی لئے یہ زبانوں کا عجائب گھر ہے۔

۴۔ اُردو کہاں پیدا ہوئی؟ عنوان کے تحت مقالے میں جن خیالات کا اظہار کیا ہے، اُن کو اپنے مختصر الفاظ میں تحریر کیجیے۔

ج۔ برصغیر ہندوپاک زبانوں کا عجائب خانہ ہے۔ یہاں لا تعداد چھوٹی بڑی زبانیں بولی اور لکھی جاتی ہے جن کے خطے اور علاقے متعین ہیں۔ ان زبانوں کا نام اپنے علاقوں کی نسبت قرار پایا ہے۔ اس کے برعکس اردو برصغیر کی واحد زبان ہے جس کا کوئی علاقہ متعین نہیں۔ یہ زبان برصغیر کے تمام خطوں اور علاقوں میں بولی جاتی ہے۔ اسلئے اس کا نام کسی علاقے یا خطے سے منسوب نہیں ہے۔ لیکن یہ بات صحیح ہے کہ تمام علاقوں میں اس کی علاقائی صورت موجود ہے۔ مثلاً دکنی اُردو، پنجابی اُردو، لکھنوی اُردو، کشمیری اُردو، وغیرہ۔ اس زبان نے اپنے ارتقاء کے دوران کئی نام اختیار کئے۔

## غزلیات فیض احمد فیض

س ۱۔ فیض کی شاعری کا موضوع کیا ہے؟

ج۔ فیض کی شاعری کا موضوع عام طور پر عشق و محبت ہے، لیکن عموماً محبوب کا لفظ آزادی، امن و امان اور انسانیت سے منسلک ہے۔ اس کے علاوہ فیض کی شاعری میں انقلابی فکر کی ہم آہنگی بھی پائی جاتی ہے۔

س ۲۔ فیض کی ان غزلوں میں قفس اور چمن یا رات اور سحر کے الفاظ ان معنوں میں استعمال نہیں ہوئے ہیں جن معنوں میں یہ عام طور پر اردو غزل میں استعمال ہوتے رہے ہیں کیا آپ فرق بتا سکتے ہیں؟

ج۔ قفس عام طور پر اردو غزل میں دنیا کے معنی میں مستعمل ہے لیکن فیض نے اسے قید خانوں کے لئے استعمال کیا ہے جہاں آزادی پسندوں کو اذیتیں دی جاتی ہیں۔

چمن کو شاعروں نے عام طور پر عارضی مسکن کے طور پر استعمال کیا ہے۔ لیکن فیض نے اسے وطن کے لئے استعمال کیا ہے۔ رات اور سحر اکثر محبوب کی جدائی اور وصال کے اوقات کے لئے استعمال کرتے ہیں۔ لیکن فیض نے غلامی کی زندگی اور آزادی کی صبح کے لئے استعمال کیا ہے۔

س ۳۔ بادنو بہار کج لب، شب ہجران، قامت جانانہ ترا کیب ہیں۔ لفظوں کو اضافت سے ملایا جائے تو ترکیب بن جاتی ہے۔ اس طرح کی فارسی تراکیب کا استعمال اردو شاعری میں عام رہا ہے۔ آپ مزید پانچ اور تراکیب لکھیے۔

ج۔ سر کا گل، دفتر جنوں، فصل گل، کوئے یار، حضور یار۔

(غزل نمبر ۱)

۱۔ گلوں میں رنگ بھرے بادنو بہار چلے

چلے بھی آؤ کہ گلشن کا کاروبار چلے

فیض غزل کے مطلع فرماتے ہیں کہ محبوب کے بغیر میری دنیا ویران ہے، شروع بہار کی خوشبودار ہوانے میری امیدوں کو تازہ کر دیا ہے، اے میرے محبوب اب تم بھی میری زندگی میں واپس آ کر میری زندگی کے کاروبار کو رونق بخشو جس طرح نو بہار کی تازہ ہوا سے پھولوں میں نئی جان اور رونق پیدا ہو گئی ہے کیونکہ بہار کے موسم میں اب صرف تیری کمی محسوس ہو رہی ہے۔

۲۔ قفس اداس ہے یار و صبا سے کچھ تو کہو

کہیں تو بہر خدا آج ذکر یار چلے

شاعر فرماتے ہیں کہ محبوب کا دیدار نہ ہونے کی وجہ سے نہ صرف میں بلکہ سارا قید خانہ اداس ہے۔ اے میرے دوستو صبح کی تازہ ہوا سے کہو کہ کہیں میرے محبوب کا تذکرہ چل رہا ہو گا خدا کے لئے اس کی کچھ خبر تو لاؤ جس سے میرے دل کو تسکین ہو جائے

۳۔ کبھی تو صبح ترے کنج لب سے ہو آغاز

کبھی تو شب سر کا گل سے مشکبار چلے

شاعر کہتا ہے کہ اے میرے محبوب کاش کبھی ایسا ہوتا کہ تیرے ہونٹوں میں خوبصورت مسکراہٹ کھل اٹھتی اور میری زندگی کی نئی شروعات ہو جاتی اور زہے قسمت کہ کبھی ایسا ہوتا کوئی رات میرے محبوب کے بالوں کی خوشبو سے معطر ہو جاتی

۴۔ بڑا ہے درد کا رشتہ یہ دل غریب سہی

تمارے نام پہ آئیں گے غمگسار چلے

شاعر کہتا ہے کہ اے میرے محبوب! یہ بات درست ہے میرا دل غریب ہے کیونکہ مجھے ابھی وصال نصیب ہوا اور اور نہ ہی تیرے پاس میری کوئی قدر و قیمت ہے مگر تیرے ساتھ میرا درد کا رشتہ ہے اے محبوب! میں تو اس جگہ بھی پہنچوں گا جہاں صرف تیرا نام ہوگا اگرچہ مجھے وہاں سے خالی ہاتھ ہی واپس آنا پڑے گا۔

۵۔ جو ہم پہ گزری سو گزری مگر شب ہجران

ہمارے اشک تری عاقبت سنوار چلے

شاعر کہتا ہے کہ میرے محبوب! جدائی کی رات میرے لئے کتنی تکلیف دہ اور کتنی لمبی تھی۔ اس رات کی سختیوں کو دوبارہ یاد نہ کرنا ہی اچھا ہے مگر تیری جدائی کی وجہ سے میری آنکھوں نے جو آنسو بہاے ہیں ان سے تو تیرے گناہ دھل گئے ہونگے، چلو کم از کم میرے آنسوؤں سے تیری آخرت تو سنو گئی۔

۶۔ حضور یار ہوتی دفتر جنوں کی طلب

گرہ میں لے کے گریبان کا تار تار چلے

شاعر کہتا ہے کہ جب محبوب کے دربار میں مجھے اپنی دیوانگی کی داستان بیان کرنے کا حکم ہوا تو میں نے اپنے پھٹے ہوئے گریبان کے ٹکڑوں کو ایک گرہ میں باندھ کر محبوب کے سامنے پیش کیا تا کہ اسی سے میرے جنوں کی انتہا کا اسکو اندازہ ہو جائے کیونکہ میری دیوانگی کی داستان لکھی نہیں جاسکتی۔

۷۔ مقام، فیض کوئی راہ میں چاہی نہیں

جو کوئے یار سے نکلے تو سوئے دار چلے

فیض غزل کے مقطع میں فرماتے ہیں کہ میرا حال تو یہ ہے کہ میں نے صرف اپنے محبوب کو پانے کی ہر ممکن کوشش کی اس کے عشق میں ناکام اور جدائی کے بعد اب تو صرف یہی راستہ ہے کہ پھانسی کے تختہ کو چوما جائے اس کے سوا کوئی تیسرا مقام تو مجھے پسند ہی نہیں۔

(غزل ۲)

۱۔ کب ٹھہرے گا درد اے دل کب رات بسر ہوگی  
سنتے تھے وہ آئیں گے سنتے تھے سحر ہوگی۔

غزل کے مطلع میں فیض فرماتے ہیں کہ یہ غلامی اور بد نصیبی کے دن اور جدائی کی لمبی راتیں کب ختم ہوں گی تاکہ میرے دل کے درد میں  
افاقہ ہو جائے میں نے سنا تھا کہ آزادی کی صبح جلد نمودار ہوگی اور ظلم و ستم کی تاریکیاں جلدی نمودار ہوگی اور ظلم و ستم کی تاریکیاں جلد مٹ  
جائیں

گی لیکن معلوم نہیں کہ کب تک انتظار کرنا پڑے گا۔

۲۔ کب جان لہو ہوگی کب اشک گہر ہوگا

کس دن تری سنوائی اے دیدہ تر ہوگی

شاعر فرماتے ہیں کہ نہ جانے وہ صبح کب آئے گی جس کا برسوں سے انتظار کر رہا ہوں جس دن میرے آنسوؤں کی قیمت پیدا ہوگی اور وہ  
کون سا دن ہوگا جس دن میری آنسو بھری آنکھوں کی فریاد سنی جائے گی میں نے تو اسی دن کے انتظار سے زندہ ہوں۔

۳۔ کب مہکے گی فصل گل کب بہکے گا مے خانہ

کب صبح سخن ہوگی کب شام نظر ہوگی

شاعر کہتا ہے کہ خدا جانے آزادیوں اور خوشیوں کے پھول کب مہک اٹھیں گے اور کب شراب خانے میں موج و مستیوں کا دور دورہ ہوگا  
اور کب وہ صبح ہوگی جب ہم اپنے محبوب سے حال دل کہیں گے اور کب اس شام کے خوبصورت نظاروں کو دیکھیں گے جس کا ہم نے برسوں  
سے انتظار کیا ہے۔

۴۔ واعظ ہے نہ زاہد ہے نا صبح ہے نہ قاتل ہے

اب شہر میں یاروں کی کس طرح بسر ہوگی

شاعر کہتا ہے کہ دنیا کے نظام میں ہر چیز کا ہونا ضروری ہے تب ہی جینے کا لطف ہے۔ لیکن میرے اس شہر میں نہ تو کوئی واعظ ہے نہ پرہیزگار  
اور نہ ہی کوئی خیر خواہ ہے اور نہ ہی کوئی قاتل دشمن ہے گویا یہ شہر قبرستان کی طرح سنسان ہے۔ اب میرے دوستوں کا یہاں زندگی گزارنا ہی  
مشکل ہے۔

۵۔ کب تک ابھی رہ دیکھیں اے قامت جانانہ

کب حشر معین ہے تجھ کو تو خبر ہوگی

شاعر فرماتے ہیں کہ اے میرے حسین قدم محبوب میں کب تک تیرا منتظر رہوں آخر تو کب آئے گا خود ہی بتا قیامت کب آئے گی تب تک تیرا  
انتظار کروں گا۔

## غزلیاتِ تنہا انصاری (۱۹۱۴-۱۹۶۹ء)

س۱۔ مداوا سے کیا مراد ہے؟

ج۔ مداوا سے مراد علاج و معالجہ ہے۔ جو بیمار آدمی کی بیماری اور مصیبت زدہ کی پریشانی دکھ و درد اور تکلیف کو دور کرنے کے لئے کیا جاتا ہے۔

س۲۔ شاعر کو پرش اعمال کا خیال کیوں خوفزدہ کرتا ہے؟

ج۔ شاعر کو اپنی گنہگاری اور کم تر اعمال کا احساس ہے اور یہی خیال اسکو خوفزدہ کر دیتا ہے کی قیامت کے دن خدا برحق کے حضور میں کیا جواب دوں گا جب اعمال کے بارے میں پوچھا جائے گا۔ اور جس دن صرف اپنے ہی اعمال کام آئیں گئے۔

س۳۔ خزاں کے تند جھونکوں سے کیا مراد ہے؟

ج۔ خزاں کے تند جھونکوں سے شاعر کی مراد انسان کی زندگی میں آنے والے مصائب و آلام، مشکل حالات و پریشانیاں ہیں جن کی وجہ سے انسان بگھ جاتا ہے۔

س؛ شاعر نے موجوں کے تلاطم کے ساتھ شکستہ ناؤ استعمال کر کے کس بات پر زور دینا چاہا ہے

س۔ شاعر نے موجوں کے تلاطم کے ساتھ شکستہ ناؤ استعمال کر کے اس بات پر زور دینا چاہا ہے کہ اگرچہ انسان کتنا ہی کمزور کیوں نہ ہو اور بے رحم حالات طوفانی لہروں کی طرح اس پر وار کیوں نہ کرتے ہوں، لیکن بہادر انسان وہی ہے جو زندگی کے ہر چیلنج کا ڈٹ کر مقابلہ کرتا ہے اور کبھی بھی ہمت نہیں ہارتا۔ نتائج کی پرواہ کیے بغیر مسلسل جدوجہد ہی اصلی کمال ہے۔

### غزل نمبر ۱

۱۔ غزل کے مطلع میں تنہا انصاری محبوب کی جدائی کا ذکر کرتے ہوئے لکھتے ہیں کی محبوب کی جدائی سے میری ہر صبح شام میں غم کا سا اندھیرا چھا جاتا ہے۔ یعنی محبوب کی جدائی میں میرا ہر پل رنج و غم میں بسر ہو رہا اور مجھے کسی بھی طرح خوشی میسر نہیں ہوتی۔

۲۔ شاعر اس شعر میں کہتے ہیں کی میرے دل کا غم اور درد کسی بھی طرح کم نہیں ہوتا ہے۔ میں اپنے دل کو جتنا بھی سنبھالنے کی کوشش کرتا ہوں یہ اتنا ہی بے قابو رہتا ہے۔ میں اپنے درد کا جتنا بھی علاج کرتا ہوں درد اتنا ہی بڑھتا جاتا ہے۔ یعنی غم بھلانے کی میں جتنی بھی کوشش کرتا ہوں غم اتنی ہی شدت پکڑتا ہے۔

۳۔ شاعر اس شعر میں اپنے محبوب سے مخاطب ہو کر لکھتے ہیں کہ اے میرے محبوب تم مجھ سے جدا ہو کر مجھ سے بہت دور جا چکے ہو۔ اب ہمارا ملنا ایک ناممکن سی بات ہے لیکن اس کے باوجود بھی میں تمہیں بھلا نہیں پاتا ہوں تمہارا خیال آکر بار بار مجھے تڑپاتا ہے۔

۴۔ شاعر اس شعر میں در پردہ اپنے محبوب کی خوبصورتی کی تعریف کرتے ہوئے لکھتا ہے کہ آسمان پر چاند شرمناک ہے اور بادلوں میں چھپ جانے کی کوشش کر رہا ہے اور اس کی وجہ یہ ہے کہ شاید میرے محبوب نے اپنے چہرے کو بے نقاب کر لیا ہوگا اور چاند میرے محبوب کے خوبصورت چہرے کو دیکھنے کے بعد شرمناک رہا ہے۔ یعنی میرا محبوب چاند سے زیادہ خوبصورت ہے۔

۵۔ شاعر اس شعر میں اپنی ندامت کو ظاہر کرتے ہوئے لکھتے ہیں کہ جب مجھے یہ خیال آتا ہے کی روزِ قیامت رب میرے اعمال کی پرسش کرے گا تو میری روح ابھی سے ٹپ اٹھتی ہے، کیونکہ میرے اعمال ایسے ہیں کہ میں اپنے رب کے سامنے کھڑا بھی نہیں ہو پاؤں۔

## غزل نمبر ۲

۱۔ تنہا انصاری غزل کے مطلع میں اپنے محبوب سے مخاطب ہو کر لکھتے ہیں کہ اے میرے محبوب تمہاری جدائی میں جو کچھ بھی میں برداشت کرتا ہوں اور جو کچھ مجھ پر گزر رتی ہیں میں اُس کو لفظوں میں بیان نہیں کر سکتا۔ جدائی میں میری حالت کیا ہوتی ہے اس کا اندازہ تو مجھے ہے لیکن آپ کو نہیں سمجھا سکتا۔

۲۔ شاعر اس شعر میں اپنی ثابت قدمی کی طرف اشارہ کرتے ہوئے لکھتے ہیں کہ میں ایسے پھول کے مانند ہوں جو طوفان میں بھی کھلتا اور لہراتا رہتا ہے اور خزاں کے تیز جھونکوں سے بھی میں مرجھا نہیں جاتا ہوں۔ یعنی میں ہر مصیبت کا سامنا کر سکتا ہوں۔

۳۔ اس شعر میں شاعر اپنی بہادری بیان کرتے ہوئے لکھتے ہیں ایک ٹوٹی کشتی میں سوار ہو کر طوفان میں پھنس گیا ہوں لیکن اس کے باوجود میں گھبرا یا ہوا نہیں ہوں یعنی چاہے زندگی میں مجھے کتنی ہی تکلیف کا سامنا کیوں نہ کرنا پڑے میں ان تکلیفوں سے گھبرا کر پیچھے ہٹنے والا نہیں ہوں۔

۴۔ اس شعر میں شاعر اپنے درد مند دل کا ذکر کرتے ہوئے لکھتے ہیں کہ یوں تو میں بڑی بڑی مصیبت کو جھیل سکتا ہوں کسی سے لڑ کر اس کو ہرا سکتا ہوں۔ لیکن اگر کسی نے مجھ سے کوئی اُمید وابستہ رکھی ہو تو میں اُس اُمید کو نہیں توڑ سکتا۔ میں ہر ایک کے ساتھ ہمدردی سے پیش آتا ہوں کسی کا دل نہیں دکھاتا۔

۵۔ غزل کے آخری شعر میں شاعر اپنے آپ سے مخاطب ہو کر لکھتے ہیں کہ محبت کی تڑپ میں مجھے زندگی کا اصل لطف حاصل ہوا اور جب سے میں محبت میں تڑپا ہوں مجھے زندگی جینے میں مزہ آیا ہے۔ لیکن میرا محبوب چاہے مجھے کتنا ہی کیوں تڑپائے میں اُس کو نہیں تڑپا سکا کیونکہ یہ میری فطرت نہیں اور مجھے کسی کو تڑپانا آتا ہی نہیں ہے۔

## تعلیم سے بے توجہی کا نتیجہ

س: تعلیم کی قدر و قیمت کیا ہے:

ج: تعلیم کی قدر و قیمت سے کسی کو انکار نہیں تعلیم سے زندگی سنور جاتی ہے اور آدمی جہالت کے اندھیرے سے باہر آتا ہے۔ ہم دیکھتے ہیں کہ دنیا میں وہی ممالک اور قومیں خوشحالی اور ترقی یافتہ ہیں جہاں کے شہریوں نے ہر طرح کی تعلیم و ہنر سے اپنے آپ کو آراستہ کیا۔ تعلیم ہی کی وجہ سے دور جدید میں انسان نے چاند پر قدم رکھا۔

س: حکومت اور قوموں پر زوال کیسے آتا ہے؟

ج۔ حکومت اور قوموں پر زوال تب آتا ہے جب وہ تعلیم سے روگردانی کرتے ہیں جب تعلیم چھوٹ جاتی ہے تو حکومت سے ہاتھ دھو بیٹھتے ہیں اور قومیں ذلیل و خوار ہو جاتی ہیں۔

س۔ شرافت اور عزت کا معیار کیا ہے؟

ج۔ شرافت اور عزت کا معیار تعلیم سے دوری انسان کو شرافت کے بلند مقام سے پستی اور بے عزتی کے دلدل میں گرا دیتے ہیں۔

س۔ ترک تعلیم کے کیا نقصانات ہیں؟

ج۔ ترک تعلیم کی وجہ سے اندھیرا چھا جاتا ہے۔ لوگ بے ہنر اور محتاج ہو جاتے ہیں۔ ہر چیز کے لئے دوسروں کے سامنے ہاتھ پھیلانے پڑتے ہیں۔ ٹوپی سے لیکر سوئی تک اور مال تجارت سے لیکر زندگی کی ہر ضرورت کے لئے دوسروں کے سہارے جینا پڑتا ہے۔ ترک تعلیم سے انسان بے کار زندگی گزارنے پر مجبور ہو جاتا ہے۔

س۔ کسی ملک اور وہاں کے عوام کی ترقی کن چیزوں سے ہو سکتی ہے؟

ج۔ کسی ملک اور وہاں کے عوام کی ترقی کار از صرف تعلیم حاصل کرنے میں ہے۔ تعلیم ہی سے اسکی معیشت ترقی کی شاہراہ پر گامزن ہو سکتی ہے۔ تعلیم کی بدولت وہ تجارت صنعت و حرفت زراعت وغیرہ میں ایجادات کر کے ملک و قوم کو ترقی کی منازل تک پہنچا سکتے ہیں۔

## نئی تہذیب

س ۱۔ اکبر نے نئی تہذیب کی کون سی برائیاں بتائی ہیں؟

ج۔ اکبر نے نئی تہذیب سے پیدا ہونے والی کئی برائیوں کا تذکرہ کیا ہے خاص کر خواتین کی بے پردگی کو بیان کیا ہے۔ انہوں نے بتایا ہے کہ نئی تہذیب سے ادب و لحاظ ختم ہو جائے گا سادگی کی جگہ تکلف اور بناوٹ وجود میں آجائے گی صداقت کی جگہ جھوٹ اور دکھاوے کی محبت عام ہوگی شریفوں کے بدلے شریروں کا مقام و مرتبے والے ہوں گے۔

س ۲۔ تقلید یورپ سے کیا مراد ہے؟

ج۔ س ۲۔ تقلید یورپ سے مراد انگریزوں کی تہذیب و طور طریقوں کی پیروی ہے، اپنی تہذیب سے نفرت کرنا۔ لباس، کھانے پینے اور رہن سہن میں مغرب کی نقل کرنا اور انہی کے رنگ میں رنگنا تقلید یورپ ہے۔

## گرامر

فاعل کے لحاظ سے فعل کی دو قسمیں ہیں۔ (۱) فعل معروف (Active) (۲) فعل مجہول (Passive)

۱۔ معروف: فعل معروف وہ فعل ہے جس کا فاعل معلوم ہو۔ مثلاً احمد نے خط لکھا۔

زید نے پانی پیا

۲۔ مجہول: فعل مجہول وہ فعل ہے جسکا فاعل نہ ہو۔ مثلاً: خط لکھا گیا۔ پانی پیا گیا وغیرہ

اسم مشتق: مصدر سے نکلے ہوئے اسم کو اسم مشتق کہتے ہیں۔ مثلاً لکھنے والا۔ لکھا ہوا۔ لکھائی وغیرہ

اسم فاعل: وہ اسم مشتق ہے جو اس ذات پر دلالت کرے جس سے کوئی کام واقع ہو لیکن فاعل کا نام ظاہر نہ ہو مثلاً لکھنے والا، کھانے والا مارنے والا وغیرہ۔

اسم مفعول: وہ اسم مشتق ہے جو اس ذات پر دلالت کرے جس پر فعل واقع ہو لیکن مفعول کا نام ظاہر نہ ہو مثلاً لکھا ہوا، کھایا ہوا، مرا ہوا۔

فاعل اور مفعول میں نام ظاہر ہوتا ہے اور وہ اسم مشتق نہیں ہوتا اسم فاعل اور اسم مفعول میں نام ظاہر نہیں ہوتا جبکہ وہ ہمیشہ اسم مشتق ہوتے ہیں۔

سابقہ لگا کر نئے الفاظ بنانا: نیا لفظ معنی

۱۔ ان پڑھ	ناخواندہ
۲۔ ان دیکھا	نادیدہ
۳۔ ان گنت	لا تعداد
۴۔ انجان	نامعلوم
۵۔ انمول	قیمتی
۶۔ انتھک	نہ تھکانے والا
۷۔ بے وقوف	بے عقل
۸۔ بے رحم	جس کو رحم نہ آئے
۹۔ لا تعداد	بے شمار
۱۰۔ لاعلم	جاہل

متضاد الفاظ:

<u>الفاظ</u>	<u>اضداد</u>
تنزل	ترقی
آسان	مشکل
خاص	عام
قدیم	جدید

تغییل

تاخیر

دور

نزدیک

پوشیدہ

ظاہر

اسم ضمیر (Pronoun) : جو کلمہ کسی اسم کی جگہ استعمال کیا جاتا ہے۔ اسم ضمیر کہلاتا ہے۔

مثلاً میں، ہم، تم، وہ، آپ وغیرہ۔ جس اسم کی جگہ اسم ضمیر آتا ہے اُسے مرجع کہتے ہیں۔

ضمیر شخص (Personal Pronoun) : ایسی ضمیر جو کسی شخص کے لئے استعمال کی جاتی ہے۔ اُسکی تین صورتیں ہیں

۱۔ ضمیر متکلم ۲۔ ضمیر مخاطب ۳۔ ضمیر غائب

۱۔ ضمیر متکلم (First Person) : جو ضمیر بات کرنے والا اپنے لئے استعمال کرے اُسے ضمیر متکلم کہتے ہیں۔ جیسے میں، ہم، مجھے،

میری وغیرہ

۲۔ ضمیر مخاطب : (Second Person) : جو ضمیر بات کرنے والا اپنے مخاطب یا حاضر کے لئے استعمال کرے اُسے ضمیر مخاطب

کہتے ہیں۔ جیسے آپ، تم، تو، تمہیں، تمہاری وغیرہ۔

۳۔ ضمیر غائب (Third Person) : جو ضمیر بات کرنے والا ایسے آدمی کے لئے استعمال کرے جو سامنے موجود نہ ہو جیسے، وہ، اُن

اُس، انہوں وغیرہ۔

چھوٹے بھائی کے نام بری صحبت سے اجتناب کے لئے خط۔

نوگام سرینگر

۳۱ مارچ ۲۰۲۰ء

پیارے عاقب

السلام علیکم ورحمۃ اللہ

میں یہاں خیریت سے ہوں اور اپنے کام کاج میں مشغول ہوں۔ مجھے تمہارے اسکول کے پرنسپل صاحب کا ایک خط موصول ہوا جس میں

انہوں نے تمہاری شکایت کی لکھی تھی کہ تم پڑھائی میں لاپرواہی کر رہے ہو اور بری صحبت کے شکار ہو گئے ہو۔

بھائی میری آپ کو نصیحت ہے کہ آپ دل لگا کر پڑھائی کرو سستی و کاہلی چھوڑ دو۔ اور بڑے بچوں سے مکمل دور رہو۔ کیونکہ اگر یہی حال

رہا تو تم زندگی بھر پچھتاتے رہو گے۔ اُمید ہے کہ تم میری نصیحت پر عمل کرو گے اور مجھے جواب میں خط ارسال کرو گے۔

والسلام

تمہارا بھائی جان

## پوسٹ ماسٹر کے نام درخواست

بخدمت جناب پوسٹ ماسٹر صاحب جنرل پوسٹ آفس سرینگر کشمیر

جناب عالی!

مودبانہ گزارش ہے کہ چند دنوں سے ہمارے حلقے میں ایک نئے ڈاکیے کی تقرری ہوئی ہے۔ وہ جلدی میں لاپرواہی سے خطوط صحیح ڈھنگ سے نہیں بانٹتا اور بعض اوقات یہ خطوط گھر کے اندر آنے کے بجائے باہر گلی کی نالیوں میں پڑے ہوتے ہیں، کل ہی دہلی سے میرے ایک قریبی رشتہ دار نے شکایت کی کہ میں نے اس کے تین خطوط کا جواب نہیں دیا مجھے حیرت ہے کہ وہ خطوط آخر کہاں غائب ہو گئے لہذا آپ سے گزارش ہے کہ مذکورہ ڈاکیے کو تنبیہ کی جائے کہ وہ اپنا کام صحیح ڈھنگ سے کرے تاکہ ہم مزید دشواریوں سے بچ سکیں۔ آپ کی عین نوازش ہوگی۔

عرض نیاز مندان  
باشندگان پپوش کالونی

تاریخ: ۳۱ مارچ ۲۰۲۰

### مضمون: خدمت خلق

درد دل کے واسطے پیدا کیا انسان کو

ورنہ طاعت کیلئے کچھ کم نہ تھے کرو بیاں

انسان کہلانے کا وہی شخص مستحق ہے جو دوسروں کیلئے دل میں درد رکھتا ہو دوسروں سے محبت کا سلوک روا رکھتا ہو۔ الغرض انسان وہ ہے جو دوسروں کیلئے جیئے۔ اپنے لئے تو حیوان اور کیڑے مکوڑے بھی زندہ رہتے ہیں۔ اس کہاوت کی تہ میں بھی یہ خیال ہے کہ انسان دوسروں کے بھلے کیلئے جیئے۔ انسان کو اشرف المخلوقات کا درجہ دیا گیا ہے اسے تمام جانداروں سے افضل اور برتر مانا گیا ہے۔ یہ درجہ اور رتبہ اسے صرف اس حالت میں حاصل ہو سکتا ہے کہ وہ دوسروں کے غم میں شریک ہو۔ دوسروں کی مصیبت میں ہاتھ بٹائے۔ ان کی مدد اور خدمت کرے خدمت اور ایثار کا جذبہ ہی انسان کو دوسرے جانداروں سے افضل بناتا ہے۔ دینا بھر کے مذاہب میں خدمت خلق پر زور دیا گیا ہے۔ اگر انسان کسی مظلوم یا دکھی کی مدد نہیں کرتا تو وہ جانور ہے بلکہ اس سے بھی گیا گذرا۔ اس سے تو ایک وفادار کتا ہی بہتر ہے جو اپنے مالک کی خدمت و محبت میں اپنی جان بھی قربان کر دیتا ہے۔

تاریخ شاہد ہے کہ دنیا میں صرف اس قوم نے بلند رتبہ پایا جس کے افراد میں خدمت خلق کا جذبہ موجود تھا۔ اگر افراد میں باہمی محبت اور ہمدردی نہ ہو اور وہ ایک دوسرے کیلئے قربانی کرنے پر آمادہ نہ ہوں تو گویا وہ ایک ایسی قوم کے افراد ہیں جس کا شیرازہ منتشر ہو چکا ہے۔ گویا قوم کے سلسلہ کی کڑیاں الگ الگ ہیں۔ ایسی قوم بدبختی کا شکار ہو جاتی ہے جب اس پر کوئی آفت نازل ہوتی ہے تو لوگوں پر جوں تک نہیں رہتی۔ وہ غرض کے بندے قوم کی مصیبت میں شریک نہیں ہوتے اور اکثر ایسا ہوتا ہے کہ وہ قوم باہمی پھوٹ کے سبب محکوم ہو جاتی ہے وہ کسی دشمن کے حملہ کی تاب نہیں لاسکتی اس لئے قوم کی قوت اور خوشی حالی کا راز افراد کے جذبہ خدمت و ایثار میں پنہاں ہے۔

خدمت خلق کی کئی صورتیں ہیں۔ محتاجوں اور مسکینوں کو کھانا کھلانا بیماروں کی تیمارداری کرنا۔ زخمیوں کی مرہم پٹی کرنا۔ گمراہوں کو راستہ بتانا۔ بوڑھوں کو سڑک پار کرانا۔ اندھوں اور اپاہجوں کی مدد کرنا۔ یتیموں کے سر پر ہاتھ رکھنا۔ بیواؤں کی امداد کرنا۔ ان پڑھ کو پڑھانا۔ کمزور کو جاہر سے بچانا۔ حادثہ کے شکار کو ہسپتال پہنچانا۔ کسی بھولے بھٹکے بچے کو اس کے گھر پہنچانا پولیس تھانے کے حوالے کرنا وغیرہ درحقیقت انسان خدمت خلق سے فرشتے پر بھی سبقت لے جاتا ہے۔ البتہ قربانی اور زحمت اٹھانے کی ضرورت ہے۔

فرشتے سے بہتر ہے انسان بننا

مگر اس میں لگتی ہے محنت زیادہ