Assignment : 4

Class : IX Mathematics

By : Sushant Agrawal

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For class IX Mathematics, the given instructions must be followed.

Link for class IX Mathematics :

1.Install "Diksha" app from Playstore.

2. Tap open after the app is installed.

3.Tap allow, to provide access to the following data to use the app at its best.

4. Open the app and login as student.

5. Select medium, class and subject.

6. Open the sixth chapter of Mathematics (Chapter 6 - "Lines and Angles") in the link.

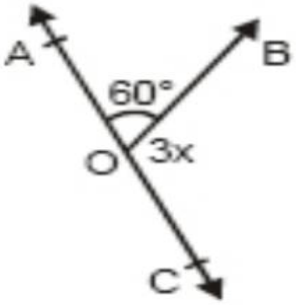
7. Go through the "explanation" content in the video tutorial.

8. In the same , there are few assignments given which you can solve as Long answers questions , short answers and multiple choice questions.

Note : Refer other videos for more detail study.

Solve the problems given below in your fair copy (Copy Questions also)

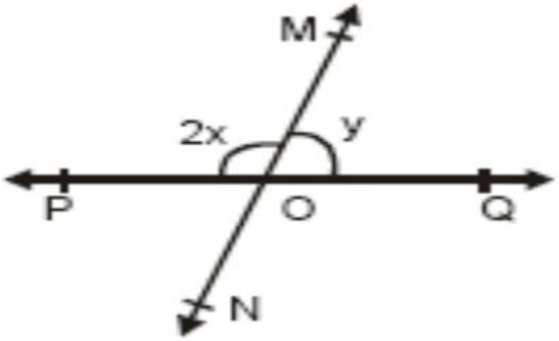
1. In the given figure, AOC is a line, find x.



2. In the given figure, $\overline{PQ}$ and $\overline{MN}$ intersect at O.

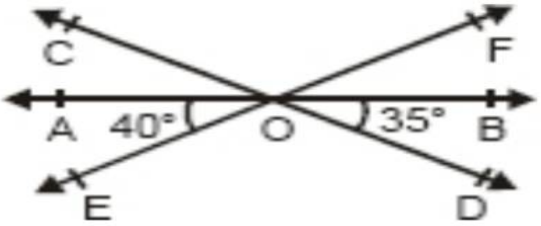
(a) Determine y, when x = 60°.

(b) Determine x, when y = 40°.



3. In the given figure, lines Ab, CD and EF intersect at O.

Find the measure of ∠AOC, ∠COF.



4. The exterior angles obtained on producing the base of a triangle both ways are 100° and 120°. Find all the angles.

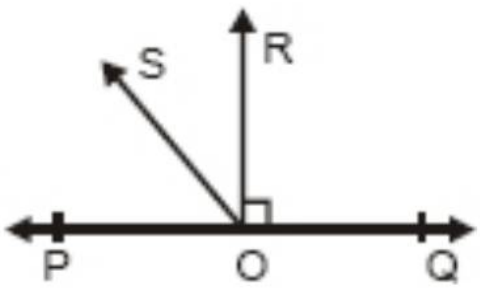
5. ΔABC is right angled at A and $AL \perp BC$. Prove that $\angle BAL = \angle ACD$.

6. If two parallel lines are intersected by a transversal, prove that the bisectors of the two pairs of interior angles enclose a rectangle.

7. The angles of a triangle are arranged in ascending order of magnitude. If the difference between two consecutive angles is 10°, find all the three angles.

8. In the given figure, POQ is a line. Ray $\overrightarrow{OR} \perp PQ$, $\overrightarrow{OS}$ is another ray lying between rays $\overrightarrow{OP}$ and $\overrightarrow{OR}$. Prove that

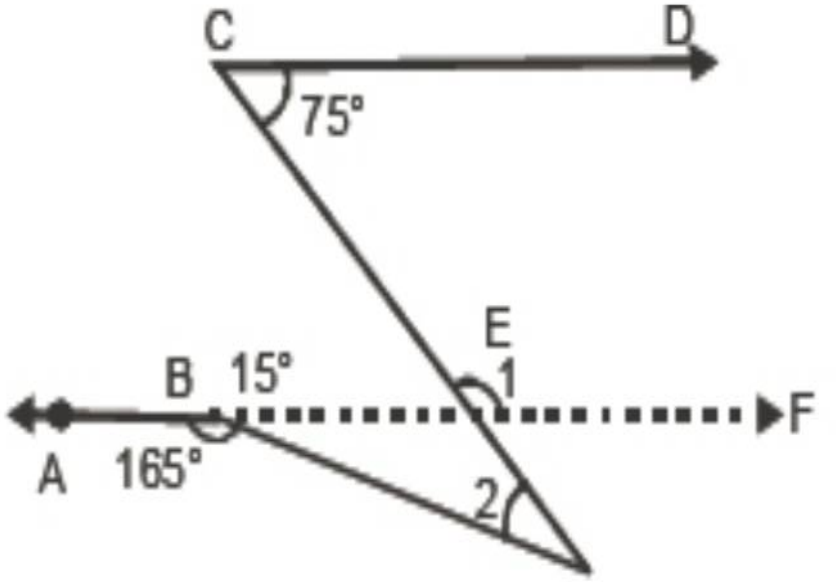
$$\angle ROS = \frac{1}{2}(\angle QOS - \angle POS).$$



9. Can a triangle have two obtuse angles? Give reason for your answer.

10. How many triangles can be drawn having its angles as 45°, 64° and 72°? Give reason for your answer.

1. In the following figure AB || CD. Find the measure of ∠BOC.



2. If P,Q and R are collinear points, then name all the line segments determined by them.

3. Find the complement of 36°

4. Find the measure of an angle which is 26° more than its complement.

5. If a ray CD stands on a line AB, then prove that

Angle ACD= angle BCD=180°

6. If two lines intersect prove that

Angle AOD=angle BOC

7. If PQ and RS are two intersecting lines which meet ar point O. If angle POR :angle ROQ= 5:7. Find all the angles.

8. Prove that the angle formed by the bisector of interior angle A and the bisector of exterior angle B of a triangle ABC is half of angle C.

9. Sides QP and RQ of triangle PQR are produced to point S and T respectively. If angle SPR= 35° and angle PQT=70°find angle SQR and angle PRQ.

10. of the three angles of a triangle, one is double the smallest and another is thrice times the smaller. Find the angles.

Assignment 4

Class- IX

English

By- Swati Asthana

Chapter 2 – The Little Girl

Chapter 3 - Iswaran the story teller

ENGLISH

Chapter 3 - Iswaran the story teller

Link- https://www.youtube.com/watch?v=prTJssDNBYc&feature=youtu.be

ENG 9 Assgn 4

Click on the above YouTube link & listen to the explanation of the story: Iswaran The Story Teller
Open Diksha App
Select English class 9
Select Moments & Iswaran the Story Teller
Select Long Answer....Do Que. No: 2 & 3
M C Q:.....Do all 5 ques.
Short Answer...Do Que.No: 1 2 & 3
Very Short Answer.....Do Que No: 1 3 & 5

Chapter 2 – The Little Girl

Link - https://www.youtube.com/watch?v=ExFRw2rzWKA&feature=youtu.be

Click on the above YouTube link & listen to the explanation of the story The Little Girl
Open Diksha App
Select English class 9
Select Beehive & The Little Girl
Select Long Answer....Do Que. No: 2 & 4
M C Q:.....Do all 5 ques.
Short Answer...Do Que.No: 2, 3 & 4
Very Short Answer.....Do Que No: 1 & 3

.....END.....

Information Technology

By- Shubhra ghosh

Libreoffice Writer

Lesson 8 Digital documentation

Assignment 4

Information Technology

Libreoffice Writer

Lesson 8 Digital documentation

✓ Visit following links to support the given content

- Editing the text in Libreoffice writer- https://www.youtube.com/watch?v=z-ZX3jYwISs
- Formatting toolbar in Libreoffice writer - https://www.youtube.com/watch?v=JvVn8xph6FE
- create and use tables in libreoffice writer- https://www.youtube.com/watch?v=gmLRu8fM6bA
- print document in libreoffice writer- https://www.youtube.com/watch?v=zOZXsTZiOY0
- using mailmerge in libreoffice writer- https://www.youtube.com/watch?v=hHRzGk_JOy4

- Solve Section A- MCQ in your book.
- Do attempt all questions of Section B in your copy.
- Do Q1, 2, 5 and 6 of Sec- C in your copy
- Solve Q1 and 5 of Sec- D in your copy

2. What does the option Create do in the Insert Address Block step?
   (a) It allows you to create an address list of recipients of letters
   (b) It allows to create a database table
   (c) Both (a) and (b)
3. What does the "Adjust Layout" step do in Mail Merge Wizard process?
   (a) It fixes where the address block and salutation show up on the document.
   (b) It fixes the size of the page.
   (c) It fixes the relative positions of various address block elements.

B. Answer the following questions.
1. How do you deal with the step 3:Insert address block of Mail Merge Wizard?
2. What are the options in the step for "Create salutation"?
3. What will happen at the last step of the Mail Merge Wizard process?

C. Practical work.
1. Create a letter and type in the body of the letter, that is common for various recipients.
2. Follow the Mail Merge Wizard steps to create each letter.
3. Edit the letter if the position of fields is not OK.
4. Take printouts of the letters.

EXERCISES

A. Multiple choice questions.

1. Which of the following software packages can be downloaded from www.openoffice.org?
   (a) MS Office (b) OpenOffice (c) LibreOffice
2. Which of these is/are basic text editor(s)?
   (a) WordPad (b) Notepad (c) Both (a) and (b)
3. Which of the following is a type of insertion mode in Writer?
   (a) INSERT (b) OVERSHADOW (c) UNDERWRITE
4. The status bar can be hidden by deselecting it in the:
   (a) Format menu (b) Styles menu (c) View menu
5. Pressing which of these buttons exits from the full screen view, if present?
   (a) Pressing Esc key (b) Pressing Ctrl + Shift + J (c) Both (a) and (b)
6. Which of the following is NOT a view available in Writer?
   (a) Normal (b) Web (c) Split screen
7. Only after some actions are undone, the _____ button becomes active.
   (a) Todo (b) Redo (c) Tidy
8. What is the shortcut for undo of an action?
   (a) Ctrl + Z (b) Ctrl + Y (c) Ctrl + U
9. Which key from the keyboard lets you choose multiple non-consecutive items from the Writer windo
   (a) Shift key (b) Ctrl key (c) Alt key

10. Which of the following will delete the table?
(a) Table > Delete > Table (b) Delete > Table (c) View > Table

11. Which shortcut will show up the Find & Replace dialog box?
(a) Ctrl + H (b) Ctrl + R (c) Ctrl + F

12. What type of clicking on a word will be needed to show the synonyms?
(a) Left clicking (b) Right clicking (c) Double-clicking

B. Short answer questions (I).

1. Describe the status bar in Writer.
2. Describe the web view in Writer.
3. How are undo and redo actions related to each other?
4. Give three ways in which vertical block of text can be selected.
5. How can you go to any page number in the Writer application?
6. Distinguish between heading and header.
7. Write down stepwise how you would insert page numbers in the header of a documen
8. What is the difference between subscripted and superscripted text? Give examples.

C. Short answer questions (II).

1. What are the ways to find text within a document?
2. What are the ways to check for spelling and grammar?
3. Give two ways in which footer can be inserted in a document.
4. What is a border used for? How can you surround a paragraph with border?
5. How would you insert an image file in a document using Drag and Drop?
6. Describe any three ways in which a table can be inserted.

D. Long answer questions.

1. How do you set the alignment of a paragraph?
2. Describe how you would select non-consecutive text items using keyboard alone.
3. How would you apply color to the shadow of a border in Writer?
4. Explain how you would insert special characters in a document.
5. How can you move a table in a document i.e. change its location?

E. Practical work.

1. Copy a document of at least two full pages from some online source.
2. Divide the text into two columns per page.
3. Click on the header and insert the page number.
4. Check if the page number is available in all pages.
5. Insert the synonym of two words of your choice from the entire document.

.....END.....

Science

BIOLOGY

BY- SHRABONI PAUL

Chapter 3- Diversity in living organisms

SCIENCE

Biology

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Diversity in living organisms-

https://www.youtube.com/watch?v=tXSH3RMjGg4&feature=youtu.be

Bio diversity (five kingdom classification)-

https://www.youtube.com/watch?v=tXSH3RMjGg4&feature=youtu.be

REVIEW

A. Answer the following questions in one or two words.

1. What is the basic unit in the hierarchy of classification?
2. What is science of classification, identification and nomenclature called?
3. Who is called 'Father of Taxonomy'?
4. What is giving two-word name to a living organism called?
5. Who wrote the book 'origin of species'?
6. Into how many kingdoms were living organisms divided by Linnaeus?
7. On the basis of nuclear membrane, what type are bacterial cells?
8. What is the other name of blue-green algae?
9. Which group does *Euglena* belong to?
10. Who coined the term 'Biological diversity'?
11. Which structure removes excess of water from the body of *Amoeba*?
12. Which group do nongreen plants that feed on dead and decaying organic matter belong to?
13. Name the life forms formed by symbiotic association between fungi and blue-green algae.
14. Which subkingdom do the plants which do not bear flowers and seeds belong to?
15. Name the plant group in which phloem is without companion cells.
16. Members of which phylum are sedentary and possess canal system?
17. Name the excretory organs of platyhelminths (flatworms).
18. Which group of triploblastic animals is without a body cavity or coelom?
19. Which phylum has animals with flattened body, spiny skin and radial symmetry?
20. Which is the largest phylum of animals?
21. Which vertebrate group is described as glorified reptiles?
22. How many vertebrae are present in the neck of man and giraffe?
23. Name the fold of skin that encloses gills in bony fishes.
24. Name the vertebrate with a venous heart.
25. In which chordate group is larva more advanced than the adult?

B. State whether the following statements are True or False.

1. Classification of plants and animals was started by Aristotle more than 2,000 years ago.
2. Rich biodiversity areas are located in the temperate regions of the world.
3. Classification reveals interrelationship among different groups of organisms.
4. Changes in the organisation of living organisms with time are responsible for biological evolution.
5. Five kingdom system of classification was introduced by Ernst Haeckel.
6. Megadiversity centres are located in warm and humid tropical regions of earth.
7. The lowest level of classification is Genus.
8. Gymnosperms differ from Angiosperms in having covered seeds.
9. *Gelidium* is commonly called brown algae.
10. Onion is an example of monocots.
11. In dicotyledons vascular bundles are arranged in ring.
12. Algae are amphibians of Plant Kingdom.
13. Lichens are the only plants that can grow on bare rocks.
14. Male sex organs of Bryophytes and Pteridophytes are called archegonia.
15. Flagellated cells or choanocytes are found in Cnidaria.
16. Silver fish and cuttle fish belong to the same phylum.
17. Parapodia are locomotory organ of mollusca.

C. Science Quiz

Choose the correct word from those given in the brackets.

1. System of classification based on some arbitrarily chosen criteria (Artificial classification/Natural classifica
2. The first word in the binomial nomenclature represents name of (Class/Genus/Sp
3. Organism considered connecting link between plants and animals (Cyanobacteria/Fungi/Eu
4. Number of obligate categories in hierarchical system of classification (4
5. The group of organisms which can breed among themselves and produce fertile offspring
6. *Nostoc* and *Anabaena* belong to (Class/Family/Sp
7. *Pinus* is an example of (Thallophyta/Bryophyta/Cyanob
8. Hyphae are present in (Conifers/C
9. *Parmelia* is a type of (Fungi/Algae/L
10. Photosynthetic pigments are absent in (Lichens/(
11. *Riccia* and *Marchantia* are (Algae
12. Organisms storing glycogen as reserve food (Liverworts/Hornworts/Phane
13. Locomotory organs in *Nereis*. (Fungi/Alg
14. Sea horse belongs to this class. (Pseudopodia, Parapodia, Walk
15. A post-anal tail is found in these animals. (Mammalia, Pisces, A
16. A pseudocoelom is present in these animals. (Chordates/Nonc
17. Electric ray is (Roundworms/Flatworms/Ear
18. Sand dollar is common name for (Torpedo
19. Leech is (*Echinus*/*Echin*
20. Jaws are absent in (Carnivorous/Sanguivorous/Sa
21. A brood pouch is present in (*Petromyzon*/*Scolic*
22. In fishes, venous blood goes to (*Hippocampus*/Sa

D. Fill in the blanks.

1. Present-day _____ organisms have evolved from simple forms living in past.
2. The system of classification of organisms that reflects their evolutionary relationship is called _____ classification.
3. The first step in the ladder of classification given by Linnaeus is _____
4. _____ is called the Father of Taxonomy.
5. Two-kingdom system of classification was given by _____ in the year _____
6. Under five-kingdom system of classification *Amoeba* is placed in kingdom _____
7. _____ are the first terrestrial plants having autotrophic mode of nutrition.
8. Closed vascular bundles are found in _____ plants.
9. The reproductive cells produced in male gymnosperms are called _____
10. Leaves of _____ plants have parallel venation.
11. _____ root system is found in monocot plants.

3. Enucleated RBCs
4. Sea cucumber
5. Protonephridia
6. Cuttle fish

(d) Mammals
(e) Respiratory tree
(f) Parental care

F. Answer the following questions in brief.

1. Name two basic features used for classifying living beings.
2. Give drawbacks of Two kingdom system of classification.
3. Why is there need for classification?
4. What are lichens? Give one use of lichens.
5. What is taxonomy?
6. Mention the characteristic features of pteridophyta.
7. Name the three groups of cryptogamae.
8. Name the categories of classification in hierarchical sequence.
9. Give two reasons for the success of arthropoda on land.
10. Summarise the three basic chordate characters.
11. Which classes of vertebrates are called amniotes and why?
12. Give two basic features of insects.
13. Vertebrate limbs are called pentadactyl. What do you mean by the term 'pentadactyl'.
14. Name the three germinal layers found in animals from which all body organs are derived?

Multiple Choice Questions (MCQs)

Tick (✓) the correct answer.

1. In the binomial system of nomenclature, the first name of an organisms represents its
   (a) Phylum ☐ (b) Order ☐ (c) Species ☐ (d) Genus
2. He is known as 'father of taxonomy'.
   (a) Darwin ☐ (b) John Ray ☐ (c) Linnaeus ☐ (d) Whittaker

3. The book 'Systema Naturae' was written by
(a) Linnaeus (b) John Ray (c) Lamarck (d) Aristotle

4. Classification of living beings on the basis of evolution is known as
(a) Taxonomic classification (b) Systematic classification
(c) Phylogenetic classification (d) Anthropological classification

5. The correct sequence of hierarchical categories is
(a) Class, Kingdom, Family (b) Class, Order, Family
(c) Family, Class, Order (d) Genus, Class, Species

6. Viruses may be placed in
(a) Prokaryotes (b) Eukaryotes (c) Monera (d) None of t

7. Unicellular eukaryotic organisms are included in the kingdom
(a) Monera (b) Protista (c) Fungi (d) Plantae

8. Phanerogamae includes
(a) Angiosperms (b) Bryophytes (c) Thallophytes (d) Pteridoph

9. This is not a monocotyledon.
(a) Maize (b) Banana (c) Pea (d) Wheat

10. Amphibians of the plant world are
(a) Bryophytes (b) Pteridophytes (c) Angiosperms (d) Gymnosp

11. *Spirogyra* belongs to class
(a) Algae (b) Fungi (c) Lichens (d) Reptilia

12. These are vascular plants
(a) Ferns (b) Hornworts (c) Liverworts (d) Mosses

13. Reproductive structures are cones in
(a) Gymnosperms (b) Ferns (c) Angiosperms (d) None of t

14. These were the last to appear in the course of evolution
(a) Vascular plants (b) Monocot plants
(c) Seed bearing plants (d) Cone bearing plants

15. Mode of nutrition in *Euglena* is
(a) Photoautotrophic (b) Saprozoic (c) Heterotrophic (d) Mixotroph

16. Which of the following is not a mammal?
(a) *Echidna* (b) Dolphin (c) Tiger (d) Turtle

17. Water vascular system is found in the members of the phylum
(a) Porifera (b) Echinodermata (c) Mollusca (d) Chordata

18. Canal system exists in members of the phylum
(a) Protozoa (b) Porifera (c) Coelenterata (d) Arthropod

19. Pneumatic bones are found in
(a) Insects (b) Birds (c) Snakes (d) Whales

20. Enucleated RBCs are found in
(a) Mammals (b) Reptiles (c) Amphibians (d) All of them

(d) Fish

characteristic feature of

(c) Reptiles

(a) Silver fish (b) Devil fish (c) Mollusca (d) Ctenophora

28. Coral forming organisms belong to the phylum
(a) Porifera (b) Coelenterate (c) Starfish (d) Molluscs

29. Radial symmetry is seen in
(a) Sponge (b) Fish (c) Respiratory organs (d) Endocrine glands

30. Malpighian tubules are
(a) Sense organs (b) Excretory organs

H. Answer the following questions.

1. To begin with all living organisms were divided into two kingdoms by Linnaeus. Give main differences bet these two kingdoms.
2. Which were the first terrestrial plants? What adaptations do they have to survive on land?
3. Explain the correlation between evolution and classification.
4. Who and on what basis created a separate kingdom for Fungi?
5. Justify 'Fungi are not plants'.
6. Which came first, bryophytes or pteridophytes? Justify your answer with reasons.
7. List differences between the following:
   (a) Algae and Fungi
   (b) Pteridophytes and Gymnosperms
   (c) Monocots and Dicots
8. Snakes and lizards are placed in the same class, though they are very different. Why?
9. Give functions of canal system in sponges.
10. Why is alimentary canal absent in a tapeworm?
11. Blood in insects does not transport respiratory gases. How is supply of oxygen maintained to the body ti
12. What is metameric segmentation?
13. Give differences between tapeworms and roundworms.
14. What is ecdysis or moulting? How is it different from metamorphosis?
15. Where is pearl formed?
16. Why are earthworms called farmer's friends?
17. Write two similarities between the following pairs:
   (a) Pisces and Amphibia
   (b) Snakes and lizards
   (c) Birds and mammals
   (d) Amphibians and reptiles
18. What are amnion, chorion and allantois?
19. What are viviparous animals? Which group of animals are viviparous?
20. Give five characteristics of class Amphibia.
21. Give an example for each of the following:
   (a) An aquatic mammal
   (b) A burrowing reptile
   (c) A flying mammal
   (d) A flightless bird
   (e) A freshwater sponge
   (f) A freshwater coelenterate
   (g) A cartilaginous fish
   (h) A burrowing annelid

.....END.....

Science

CHEMISTRY

BY- SHRABONI PAUL

Chapter – Is matter around us?

CHEMISTRY

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Chapter link on separation of mixture-

https://www.youtube.com/watch?v=igNFFevocnQ&feature=youtu.be

Link on separation of immiscible liquids-

https://www.youtube.com/watch?v=oO_l2hDKHAU&feature=youtu.be

A. Answer the following questions in one or two words.

1. On the basis of composition, what are the two classes of matter?
2. What are different categories of pure substance?
3. Name the types of mixtures.
4. Name the constituents of brass.
5. How are elements classified?
6. Is air a mixture or a compound?
7. Give two familiar examples of colloids.
8. What are physical states of dispersed phase and dispersion medium of fog?
9. When a strong beam of light is passed through milk, the path of light becomes visible. What is this phenomenon called?
10. Name two common methods of expressing the concentration of a solution.
11. Name the method of separation used to separate cream from milk.
12. Name two compounds which sublime on heating.
13. State one instance where water undergoes physical change and one in which it undergoes chemical change.
14. State whether colloidal solutions are homogeneous or heterogeneous?
15. Name the process by which all the dyes present in black ink can be recovered.

B. State whether the following statements are True or False.

1. Particles of a colloidal solution can always be seen with the naked eye.
2. Colloidal solutions are heterogeneous in nature.
3. Digestion of food is a chemical change.
4. Path of light becomes visible when light passes through an aqueous solution of sugar.
5. Milk is a homogeneous mixture.
6. A new substance is formed in a physical change.
7. A compound is formed by chemical combination of atoms in a definite proportion.
8. Ethanol can be separated from a mixture of ethanol and water by a separating funnel.
9. Distillation is used for separation of a mixture containing two miscible liquids that boil without decomposition and have a difference of more than 25°C in boiling points.
10. The technique of chromatography is based on the difference in solubility of the substances in the solvent the rates at which the substances are adsorbed on a suitable adsorbent.
11. The components of a colloidal solution can be separated by ordinary filtration.
12. During burning of a candle, both physical and chemical changes take place.

C. Answer these questions in Yes and No.

1. Is a compound a homogeneous substance with definite composition?
2. Do the colloidal particles settle on centrifugation?
3. Is drying of clothes a physical change?
4. Do you agree with the statement that a solution is always a liquid?
5. Will a colloidal solution pass as such through an ordinary filter paper?
6. Will a sugar solution in water show Tyndall effect?

7. The components of a true solution can be separated by filtration.
8. Is baking soda a mixture?
9. Solubility of salts in water generally increases with rise in temperature but in some cases, it decreases.
10. Does chemical composition of a substance remain the same during a physical change?

D. Answer the following questions in brief.

1. Name two metals which are highly malleable and ductile.
2. What is the type of mixture represented by air containing suspended dust and smoke particles?
3. How can a saturated solution be made unsaturated without adding solvent to it?
4. Select the chemical change from the following:
   (a) Tearing up a paper into pieces
   (b) Iron piece becomes red on strong heating
   (c) Burning of petrol in a car engine
   (d) Melting of ice
5. List two conditions essential for using distillation as a method of separation of the components of a mixture of two liquids.
6. Identify the homogeneous mixture from the following:
   Starch solution, soda water, soap solution, milk
7. Name two important methods for expressing concentration of a solution.
8. Identify dispersed phase and dispersion medium in the following colloids:
   (a) Fog
   (b) Cheese
9. If 10 mL of ethyl alcohol is mixed with 90 mL of water, calculate the concentration of the solution.
10. Which technique would you employ to separate oxygen from air?

E. Fill in the blanks.

1. An element is made up of only one kind of _____.
2. Vinegar is _____ solution but milk is _____ solution.
3. Immiscible liquids are separated by using a _____.
4. A mixture of petrol and kerosene can be separated by _____.
5. Ice, water and water vapour look physically different but they are _____ same.
6. When light is passed through diluted milk, a bluish tinge is seen. This phenomenon is called _____.
7. In a colloidal system called gel, the dispersed phase is _____ and dispersion medium is _____.
8. To obtain different pigments present in the extract of the petals of a flower, we use the technique called _____.
9. The amount of solute dissolved in 100 g of water to make a saturated solution, is called the _____ of the solute in water.
10. An emulsion is _____ mixture and its components can be separated by the technique known as _____.
11. A mixture of two or more miscible liquids for which the difference in boiling points is less than 25°C, can be separated by the process called _____.
12. Normally, common salt (sodium chloride) is obtained by _____ of sea water.

11. Which one of the following is not a metalloid?
(a) Boron (b) Silicon (c) Gallium (d) Germanium

12. The elements which normally exist as liquid under ordinary conditions are
(a) Bromine and iodine (b) Bromine and chlorine
(c) Mercury and iodine (d) Mercury and bromine

13. Pure copper sulphate can be obtained from its impure sample by the process of
(a) Filtration (b) Evaporation
(c) Crystallisation (d) Fractional distillation

14. Naphthalene can be separated from sand by
(a) Sublimation (b) Distillation
(c) Crystallisation (d) Using water as a solvent

15. Which of the following is added during the treatment of water at waterworks to disinfect water?
(a) Potassium permanganate (b) Betadine
(c) Sodium chloride (d) Chlorine

16. Which of the following is an example of solid foam?
(a) Butter (b) Bread
(c) Shaving cream lather (d) Ruby glass

17. Which of the following will not show Tyndall effect?
(a) Soap solution (b) Starch solution
(c) Sugar solution (d) Gold sol

18. Milk of magnesia is a
(a) True solution (b) Suspension
(c) Colloidal solution (d) Homogeneous mixture

19. Which of the following is not a chemical change?
(a) Formation of curd from milk (b) Ripening of a fruit
(c) Sublimation of ammonium chloride (d) Rusting of a car body

20. Which of the following are physical changes?
(i) Melting of an iron rod
(ii) Rusting of an iron rod
(iii) Bending of an iron rod
(iv) Hammering an iron rod into a sheet
(a) (i), (iii) and (iv) (b) (i), (ii) and (iii)
(c) (ii), (iii) and (iv) (d) (i), (ii) and (iv)

21. In which of the following colloids, is dispersed phase a liquid and dispersion medium a gas?
(a) Cloud (b) Smoke (c) Soap bubble (d) Gel

22. Which of the following involves fractional distillation?
(i) Separation of constituents from liquefied air
(ii) Separation of constituents from crude petroleum
(iii) Separation of carbon tetrachloride from water
(iv) Separation of naphthalene from common salt
(a) (i) and (iii) (b) (i) and (iv) (c) (ii) and (iv) (d) (i) and (ii)

Class 9

ASSIGNMENT 4

CHEMISTRY

TOPIC - Separation of Components of Mixture.

Exercise and Questions - Exercises to be done in the book. Questions to be done in assignment copy.

.....END.....

PHYSICS

BY- SANCHITA BIHANI

=> Firstly read the content in the pdf
=>Do the solved examples and then the hand written Numericals , in your Physics copy.
=>1. State and derive the mathematical formula of the Second Law of Motion.
2. Define Third Law of Motion and give two applications of it.
3. State and derive the Law of Conservation of Momentum.

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2.8 SECOND LAW OF MOTION

The first law of motion indicates that to start motion in a stationary object, an unbalanced external force must be applied on the object. In other words, when an unbalanced external force acts on an object, its velocity changes, i.e., the object gets an acceleration.

We now want to study how the acceleration produced in an object depends on the force applied to it and how we measure a force. Newton's second law of motion provides an answer to these questions.

Statement: The second law of motion states that the rate of change of momentum of an object is directly proportional to the applied unbalanced force and the change in momentum takes place in the direction of applied force.

2.8.1 Mathematical Formulation of Second Law of Motion

Let an object of mass m be initially (time $t = 0$) moving along a straight line with a velocity u. A constant force F is applied on the object so that it is uniformly accelerated to a velocity v in time t.

$\therefore$ Initial momentum of the object, $p_1 = mu$

and final momentum of the object, $p_2 = mv$

$\therefore$ Total change in momentum $= p_2 - p_1$

$= mv - mu = m(v - u)$

Fig. 2.15

As the change in momentum has taken place in time t, hence

$$\text{The rate of change of momentum} = \frac{(p_2 - p_1)}{(t - 0)} = \frac{m(v-u)}{t}$$

As per the statement of Newton's second law of motion, the rate of change of momentum of an object is proportional to the force applied on it. Hence, we have

$$F \propto \frac{m(v-u)}{t}$$

or
$$F = k\frac{m(v-u)}{t} = km\left(\frac{v-u}{t}\right) \quad \ldots(2.2)$$

Here, k is a constant of proportionality. Moreover, by definition of acceleration, we know that

$$\text{Acceleration, } a = \frac{\text{Change in velocity}}{\text{Time}} = \frac{v-u}{t}$$

Hence, the relation (2.2) may be written as:

$$F = kma \quad \ldots(2.3)$$

Units of force are usually chosen in such a manner that if mass $m = 1$ and $a = 1$, then magnitude of force is also unity, i.e., $F = 1$.

On substituting these values in relation (2.3), we have

$$1 = k \times 1 \times 1 \Rightarrow k = 1$$

In such a situation, value of proportionality constant k becomes 1 and so the relation (2.3) is simplified as:

$$F = ma \quad \ldots(2.4)$$

Thus, according to mathematical formulation of second law of motion, we can say that **the force acting on an object is equal to the product of the mass of the object and the acceleration produced in it by the force.** Moreover, **the force acts in the direction of the acceleration**. Thus, the relation (2.4) gives a measure of force acting on an object as a product of its mass and acceleration. **The force is a vector quantity** having both magnitude and direction. **The direction of force is same as that of acceleration produced by it.**

From the relation (2.4), we can also say that:

(i) For an object of constant mass, force applied is proportional to acceleration to be produced, i.e., For constant value of m, we have

$$F \propto a$$

(ii) In order to produce a given acceleration, force applied is proportional to mass of the object on which that force is applied. Thus, for constant acceleration a, we have

$$F \propto m$$

These relationships have been graphically represented in Fig. 2.16 (a) and (b) respectively.

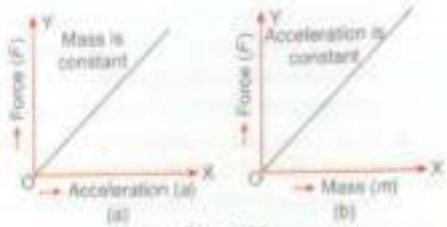


Fig. 2.16

2.8.2 Unit of Force

As per relation (2.4), we have

$$F = ma$$

If $m = 1$ unit and $a = 1$ unit, then $F = 1 \times 1 = 1$ unit

Thus, one unit force is the force which produces unit acceleration in an object of unit mass.

SI unit of Force. In SI unit system, the unit of mass is kg and the unit of acceleration is m s^{-2}. Therefore, **force is said to be 1 SI unit which produces an acceleration of 1 m s^{-2} in an object of 1 kg mass.** This unit of force is a **newton** and its symbol is N. The SI unit of force is named in the honour of Sir Isaac Newton.

$$\therefore \quad 1 \text{ newton (1 N)} = 1 \text{ kg m } s^{-2} \qquad ...(2.5)$$

2.8.3 Second Law of Motion is Consistent with the First Law of Motion

As per the mathematical expression of second law of motion, we have

$$F = ma$$

If $F = 0$, then it implies that acceleration, $a = 0$ because mass m cannot be zero. It means that in the absence of a net unbalanced external force, the acceleration of an object is zero and the object is in a state of uniform linear motion. Obviously, this is the result of first law of motion. Thus, it is clear that the second law of motion is consistent with first law of motion and vice versa.

Knowledge Desk

The CGS unit of force is 1 dyne, where

$$1 \text{ dyne} = 1 \text{ g} \times 1 \text{ cm } s^{-2} = \frac{1}{1000} \text{kg} \times \frac{1}{100} \text{m } s^{-2}$$

$$= 10^{-5} \text{ kg m } s^{-2} = 10^{-5} \text{ N}$$

or $1 \text{ N} = 10^5$ dyne

2.8.4 Some Applications of Newton's Second Law of Motion

Newton's second law of motion plays an important role in our everyday life. Some important applications of Newton's second law of motion are as given below:

1. **A fielder while catching a fast moving cricket ball gradually pulls his hands backwards with the moving ball.** This is done so as to increase the time of catch in which the high velocity of a moving ball decreases to zero. Thus, negative acceleration of the ball is decreased and therefore, the force of impact of catching the ball is also reduced.

Fig. 2.17 A fielder catching a fast moving ball

If the ball is stopped by the fielder suddenly, then its high velocity decreases to zero in a very short interval of time. It means that the rate of change of momentum of the ball is large and consequently, a large force is to be applied for holding the catch that may hurt the palm of the fielder.

Knowledge Desk

- An accelerated motion is always due to an external unbalanced force. Acceleration cannot be produced by an internal force.
- Acceleration produced in an object is determined by the external force acting on the object at that very moment and does not depend on past history of motion of the object.

  As soon as force acting on an object is removed, its acceleration becomes zero and object starts moving with a constant velocity.
- If the force acting on an object is in the direction of motion, the acceleration produced in it is positive and the object is speeded up. On the other hand, if the force is in a direction opposite to that of motion, the acceleration produced is negative and the object's motion is slowed down.

2. **Automobiles are fitted with springs (the shockers) so as to reduce jerks while passing over a rough road.** Due to the spring system, the time of impact of jerk, caused by unevenness of road, is increased and consequently, rate of change of momentum and hence the force of jerk experienced by the passengers sitting in the vehicle is reduced by a large extent.

3. **In a high jump athletic event, the athletes are made to fall either on a cushioned mattress or a loose sand bed.** When an athlete falls on the mattress after his jump, the mattress is slowly pressed downwards. So, the time of fall of an athlete is increased and rate of fall of his momentum is less. Consequently, a less force is exerted and athlete is safe.

4. **A person falling from a height on a hard cemented floor gets injured but a person falling on a grassy surface or a heap of sand is not injured.** When a person falls on a hard cemented floor, he abruptly comes to rest within an extremely short time. So, rate of decrease in momentum of the person and consequently the force acting on him due to floor is large and he is liable to get injured. However, when the person falls on a soft surface like a grassy lawn or a heap of sand or straw, the time of fall is increased. As a result, the rate of fall in momentum and hence the force is less and person is not injured.

5. **A karate player can break a slab of ice or a pile of tiles or bricks with a single blow.** The karate player strikes the ice slab or a thick pile of tiles with his hand as fast as possible so that the time of strike is extremely small. As the momentum of the hand of karate player is reduced to zero in an extremely short time after the strike, a large force is exerted by him on the ice slab. The force is enough to break the slab.

Fig. 2.18 A karate player breaking a pile of tiles

6. **Delicate electronic items, crockery and chinaware are wrapped with bubbled polymer sheets and packed in thermocole boxes.** If, by mistake, the item is mishandled, the time of impact is increased due to soft nature of thermocole. As a result, the rate of change of momentum and hence the force of impact is reduced by a large extent. So, the chance of damage to appliances or crockery is reduced by a large extent.

   Due to this very reason, glasswares and sanitarywares are packed with straw or paper cuttings all around them.

7. **When a fast moving train collides with a stationary train, huge damage is caused to the moving train.** As a result of collision, the moving train suddenly comes to rest and rate of change of momentum of a moving train is extremely large. As a result of this, force of impact on moving train is extremely large, which causes a huge damage to the moving train.

   Due to this very reason, a fast moving car suffers more damage than a stationary car during their collision.

KNOWLEDGE DESK

We know that

$$\text{Force applied} = \frac{\text{Change in momentum}}{\text{Time}}$$

$\therefore$ Total change in momentum of an object = Force applied on the object (F) x Time for which the force is applied (t)

This term Ft is commonly referred to as the **impulse** of the force and its SI unit is N s or kg m s^{-1}.

8. **A boxer moves his head backwards when his opponent blows a punch on his face.** By moving his head backwards, the boxer is able to increase the time of impact. Hence, the impact of the punch on his face is comparatively less.

9. For wrestling bouts, it is desirable to have soft mattings or loose soil in the wrestling arena. This minimises the risk of injury to the wrestlers.

10. A sprinter is advised to come to stop slowly even after completing his race so as to increase the time of stop. Again, a bowler in the game of cricket runs slowly for few steps as a follow up after delivery of the ball.

EXAMPLE 2.3: A man pushes a box of mass 40 kg with a force of 150 N. What is the acceleration produced in the box due to this force?

SOLUTION: Here, mass of the box, m = 40 kg and force applied, F = 150 N

As per relation, $F = ma$, the acceleration produced in the box is given as:

$$a = \frac{F}{m} = \frac{150}{40}$$
$$= \mathbf{3.75\ m\ s^{-2}}$$

EXAMPLE 2.4: A constant force acts on an object of mass 3.2 kg for a duration of 6 s. It increases the velocity from the object from 2.5 m s^{-1} to 9.0 m s^{-1}. Find the magnitude of the force.

SOLUTION: Here, mass of an object, $m = 3.2$ kg; initial velocity, $u = 2.5\ m\ s^{-1}$; final velocity, $v = 9.0\ m\ s^{-1}$ and time, $t = 6$ s

As acceleration $a = \frac{v-u}{t}$, hence the magnitude of force is given as:

$$F = ma = \frac{m(v-u)}{t}$$
$$= \frac{3.2 \times (9.0 - 2.5)}{6} = \frac{3.2 \times 6.5}{6} = \mathbf{3.47\ N}$$

EXAMPLE 2.5: Which would require a greater force, accelerating a 12 kg body at 3 m s^{-2} or a 4 kg body at 8 m s^{-2}?

SOLUTION: Force required to accelerate a mass $m_1 = 12$ kg at $a_1 = 3\ m\ s^{-2}$ is given as:

$$F_1 = m_1 a_1 = 12 \times 3 = \mathbf{36\ N}$$

and force required to accelerate a mass $m_2 = 4$ kg at $a_2 = 8\ m\ s^{-2}$ is given as:

$$F_2 = m_2 a_2 = 4 \times 8 = \mathbf{32\ N}$$

Obviously, $F_1 > F_2$. Thus, a greater force is required to accelerate a 12 kg body at 3 m s^{-2}.

EXAMPLE 2.6: A ball of mass 200 g moving with a velocity of 90 km h^{-1} is stopped by a fielder in 0.5 s. Calculate the force applied by the fielder to stop the ball.

SOLUTION: Here, mass of the ball, $m = 200$ g $= 0.2$ kg; initial velocity of the ball, $u = 90\ km\ h^{-1} = 90 \times \frac{5}{18}\ m\ s^{-1}$ $= 25\ m\ s^{-1}$; final velocity of the ball, $v = 0$ and time, $t = 0.5$ s

$\therefore$ Force acting on the ball, $F = ma$

$$= \frac{m(v-u)}{t} = \frac{0.2 \times (0-25)}{0.5} = \mathbf{-10\ N}$$

The –ve sign of force signifies that force applied by the fielder is a retarding force.

EXAMPLE 2.7: A bullet of mass 10 g travelling horizontally with a velocity of 150 m s^{-1} strikes a stationary wooden block and comes to rest in 0.03 s. Calculate the distance of penetration of the bullet into the block. Also, calculate the magnitude of force by wooden block on the bullet. **[CCE 2012]**

SOLUTION: Here, mass of the bullet, $m = 10$ g $= 0.01$ kg, initial velocity, $u = 150\ m\ s^{-1}$; final velocity, $v = 0$ and time, $t = 0.03$ s

$\therefore$ Acceleration of the bullet during penetration through a wooden block

$$a = \frac{v-u}{t} = \frac{0-150}{0.03} = -5 \times 10^3\ m\ s^{-2}$$

As per relation, $v^2 - u^2 = 2as$, the distance of penetration s is given as:

$$s = \frac{v^2 - u^2}{2a} = \frac{(0)^2 - (150)^2}{2 \times (-5 \times 10^3)}$$
$$= \mathbf{2.25\ m}$$

and magnitude of force exerted by wooden block on the bullet

$$F = m|a|$$
$$= 0.01 \times 5 \times 10^3 = \mathbf{50\ N}$$

EXAMPLE 2.8: A force of 6 N produces an acceleration of 8 m s^{-2} on a mass m_1 and an acceleration of 12 m s^{-2} on mass m_2. Calculate the values of m_1 and m_2. What acceleration would the same force produce if both the masses are tied together?

SOLUTION: As force $F = 6$ N produces an acceleration $a_1 = 8$ m s^{-2} on a mass m_1, hence

$$m_1 = \frac{F}{a_1} = \frac{6}{8}$$

$$= \mathbf{0.75\ kg}$$

Again, the same force of $F = 6$ N produces an acceleration $a_2 = 12$ m s^{-2} on a mass m_2, hence

$$m_2 = \frac{F}{a_2} = \frac{6}{12}$$

$$= \mathbf{0.50\ kg}$$

If both masses are tied together, then total mass,

$$m = m_1 + m_2 = 0.75 + 0.50 = 1.25 \text{ kg}$$

$\therefore$ Acceleration produced now, $a = \frac{F}{m} = \frac{6}{1.25}$

$$= \mathbf{4.8\ m\ s^{-2}}$$

EXAMPLE 2.9: The velocity–time graph of a rubber ball of mass 80 g moving along a straight line on a long rough table is given in adjoining figure 2.19. How much force does the table exert on the ball to bring it to rest? What is the distance covered by the ball during this time?

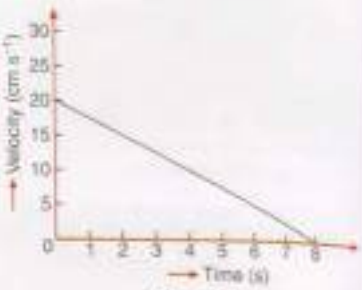


Fig. 2.19

SOLUTION: As per graph, the initial velocity of the ball, $u = 20$ cm s^{-1} = 0.2 m s^{-1}. Due to force of friction offered by table, the velocity of the ball decreases down to zero in 8 s. Hence, time $t = 0$ and final velocity, $v = 0$. Moreover, mass of the ball, $m = 80$ g = 0.08 kg

As velocity–time graph is a straight line, the motion of the ball is a uniformly accelerated motion. The acceleration is given as:

$$a = \frac{v - u}{t} = \frac{0 - 0.2}{8} = -0.025 \text{ m s}^{-2}$$

$\therefore$ Force of friction exerted by the table on the ball,

$$F = ma = 0.08 \times (-0.025) = \mathbf{-2.0 \times 10^{-3}\ N}$$

The negative sign of force shows that force of friction is opposing the motion of the ball.

Now, as per relation, $v^2 - u^2 = 2as$, the distance covered by the ball before coming to rest will be

$$s = \frac{v^2 - u^2}{2a}$$

$$= \frac{(0)^2 - (0.2)^2}{2 \times (-0.025)} = \mathbf{0.8\ m}$$

EXAMPLE 2.10: Two horizontal forces $F_1 = 12$ N and $F_2 = 7.5$ N are acting on a block of mass 3 kg in mutually opposite directions as shown in the adjoining Fig. 2.20. If the surface is perfectly frictionless, then what is the acceleration of the block and in which direction?

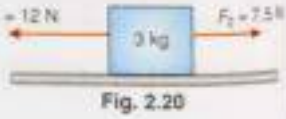


Fig. 2.20

SOLUTION: Here, mass of the block, $m = 3$ kg

As forces F_1 = 12 N and F_2 = 7.5 N are acting in mutually opposite directions, hence the net force $F = F_1 - F_2 = (12 - 7.5)$ N = 4.5 N and it acts in the direction of bigger force F_1.

$\therefore$ Net acceleration of the block, $a = \frac{F}{m} = \frac{4.5 \text{ N}}{3 \text{ kg}} = \mathbf{1.5 \text{ m s}^{-2}}$

The acceleration is in the direction of force F_1, i.e., it is towards left.

2.9 THIRD LAW OF MOTION

It is our common experience that whenever an object A exerts some force on another object B, the object B also exerts some force on object A. Experimentally, it is observed that these two forces are equal in magnitude but opposite in direction. If we call the force exerted by object A on object B as the **action force**, then the force exerted by object B on object A is called the **reaction force**. To make the concept clear, we consider following examples:

1. In the game of hockey or football, sometimes, one player collides with another player. Both players feel hurt because each player applies force to the other player. Here, force applied by one player on the other is **action force**, and the force exerted by second player on the first is the **reaction force** and both action and reaction forces are acting simultaneously.
2. When you strike a rubber ball against a hard wall or hard floor, the ball exerts a force on the wall or on the floor. This is the **action force**. In turn, the wall or floor exerts an equal force on the ball in opposite direction. Due to this **force of reaction**, the ball rebounds back to you.

Newton's third law of motion tells us the relation between action and reaction forces.

Statement: **To every action, there is an equal and opposite reaction.**

In other words, **the third law of motion states that when one object exerts a force on another object, the second object instantaneously exerts a force back on the first. These two forces are always equal in magnitude but opposite in direction.** In this context, following points are important:

ACTIVITY 2.5

To demonstrate action-reaction forces

Take two cardboard sheets of about 60 cm x 60 cm and thickness 18 mm. Fix two pairs of hard ball-bearing wheels (say, skate wheels) symmetrically on each sheet. In this manner, you have prepared two small carts. Now, ask two of your friends to stand on these carts as shown in the adjoining figure. Prepare a small bag full of sand and close its open end with a thread. Give the bag to one of your friends and ask them to play a game of catch with the bag. When they play the game, observe their motion carefully. You will observe that when one player throws the sand bag (by applying some action force on it) to other, he receives an instantaneous reaction due to which he along with his cart move in backward direction. Same result is observed when second player throws the bag to first player.

The activity proves that action and reaction forces act simultaneously.

1. **The words action and reaction indicate two forces.** If two objects interact, then force exerted by any one object on the other may be called an action force and the force exerted by the other object on the first one is called the reaction force.
2. **Action and reaction forces act simultaneously for exactly equal time.** It is wrong to assume that action acts first and reaction takes place later on. **The two forces act simultaneously.**

3. **Magnitudes of action and reaction forces are always equal but their directions are mutually opposite.** To prove this, we can perform a simple experiment as given below.

Fig. 2.21

Experiment. Take two accurate spring balances of same range. The hookes of two balances A and B are joined together as shown in Fig. 2.21. Attach the fixed end of balance B with a rigid support (say a wall). Apply a force through the free end of spring balance A. Carefully, note the readings of two balances. You will find that both the spring balances show the same readings on their respective scales. It clearly shows that force exerted by spring balance A on spring balance B (the action force) is exactly equal but opposite in direction to the force exerted by the balance B on balance A (the reaction force).

4. **The action and reaction forces always act on two different objects. Due to this reason, the action and reaction forces never cancel each other.**
5. From Newton's third law of motion, it is clear that **forces always occur in pairs. A single force in nature is not possible.**
6. **Although action and reaction forces are always equal in magnitude, these forces may not produce accelerations of equal magnitudes.** This is because each force acts on a different object and masses of these objects may be different.

Examples to Illustrate Newton's Third Law of Motion

1. **Walking of a person:** When a person walks on a road, he pushes the road below backwards with his foot. In turn, the road exerts an equal force of reaction on the foot of the person in forward direction, due to which, the person is able to walk forward on the road.
2. **Swimming of a person:** While swimming, a swimmer pushes the water backwards with his arms. Thus, action force is acting on water in backward direction. In turn, water exerts an equal force of reaction on the swimmer in forward direction, due to which, the swimmer is able to swim forward.
3. **Recoil of a gun:** When a gun is fired, it exerts a forward push on the bullet. The bullet exerts an equal and opposite reaction force on the gun. As a result, the gun recoils in backward direction. Since mass of the gun is much greater than that of the bullet, for same force, the backward acceleration of the gun is much less than the forward acceleration of the bullet.
4. **Flight of a bird:** While flying, the bird pushes air backwards with his wings. In turn, air exerts an equal reaction force on the bird. Due to this reaction force, the bird is able to fly in forward direction.
5. **Rowing of a boat in a river:** While rowing his boat in a river, a boatman pushes the water backwards with his oars. In turn, the river water exerts an equal and opposite reaction on the boat. This reaction force is responsible for motion of the boat in the river.
6. **When a sailor jumps out of a rowing boat, the boat is found to move in a backward direction due to reaction force.**
7. **Working principle of a jet plane:** Burning of a fuel in a jet plane produces a large quantity of hot gases. These hot gases escape through a nozzle (a fine jet like opening) with a great force in backward direction. It is the action force. These hot gases, in turn, exert


Fig. 2.22 Persons walking in the park


Fig. 2.23 A swimmer swimming in a pool


Fig. 2.24 A boatman rowing his boat


Fig. 2.25 Smoke trail of Jet plane

an equal force of reaction on jet plane, due to which, the plane is accelerated in the forward direction. Same principle is made use of in operation of rockets.

8. **A ball rebounds after striking a hard floor:** When a ball thrown from a height strikes a hard floor, it exerts a force on the floor. In turn, the floor exerts an equal and opposite reaction force on the ball. As a result, the ball rebounds.

2.10 LAW OF CONSERVATION OF MOMENTUM

We have seen that in accordance with the second law of motion, the momentum of an object changes when an external unbalanced force acts on it. Obviously, if no net force is acting on an object, then its momentum must remain unchanged. We can generalise the result for a system of two or more objects mutually interacting amongst themselves. The general result is expressed in the form of a law, which is commonly known as the **law of conservation of momentum**.

Statement: **For an isolated system (where there is no net external force), the total momentum of the system remains conserved.**

The law of conservation of momentum is a direct consequence of Newton's second and third laws of motion.

The law of conservation of momentum is a universal law and it applies to all types of systems ranging from atomic level to astronomical level.

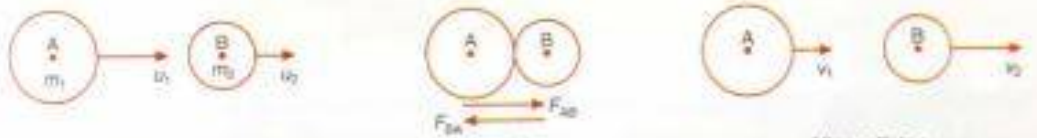
KNOWLEDGE DESK

All conservation laws are considered to be fundamental laws in physics. The conservation laws are based on observations and experiments. The law of conservation of momentum was formulated nearly three centuries ago and till date not even a single situation has been realised which contradicts this law.

Let us now try to establish the law of conservation of momentum for collisions between two moving balls.

Collision of Two Moving Balls and the Law of Conservation of Momentum

Consider two balls A and B of masses m_1 and m_2 travelling in the same direction along a straight line with velocities u_1 and u_2 respectively as shown in Fig. 2.14 (a). Let there is no external unbalanced force of any sort acting on the balls.



Before collision (a) | At collision (b) | After collision (c)

Fig. 2.26

If $u_1 > u_2$, then at some instant, the two balls collide with each other as shown in Fig. 2.14(b). Let the collision last for a time t. During collision, the ball A exerts a force F_{AB} on ball B and the ball B exerts a force F_{BA} on ball A. Let v_1 and v_2 be the velocities of the balls A and B respectively after the collision as shown in Fig. 2.14(c).

Obviously, initial momentum of ball A = m_1u_1 and its final momentum = m_1v_1

$\therefore$ Change in momentum of ball A due to collision = Final momentum − initial momentum

$$= m_1v_1 - m_1u_1$$

As per Newton's second law of motion, rate of change of momentum of an object is equal to external force acting on it. Hence, for ball A, we have

$$F_{BA} = \frac{(m_1v_1 - m_1u_1)}{t} \quad \ldots(2.6)$$

Similarly, for ball B, we can write

$$F_{AB} = \frac{(m_2v_2 - m_2u_2)}{t} \quad \ldots(2.7)$$

According to Newton's third law of motion, force F_{AB} exerted by ball A on ball B (action force) during collision is exactly equal and opposite to the force F_{BA} exerted by ball B on ball A (reaction force). Therefore, we have

$$F_{AB} = -F_{BA} \quad \text{...(2.8)}$$

It means that

$$\frac{m_2v_2 - m_2u_2}{t} = -\left[\frac{(m_1v_1 - m_1u_1)}{t}\right]$$

$$\Rightarrow \quad m_2v_2 - m_2u_2 = -m_1v_1 + m_1u_1$$

$$\Rightarrow \quad m_1v_1 + m_2v_2 = m_1u_1 + m_2u_2 \quad \text{...(2.9)}$$

But $(m_1v_1 + m_2v_2)$ is the total momentum of two balls A and B, taken together, after the collision and $(m_1u_1 + m_2u_2)$ is their total momentum before collision. We thus conclude that **total momentum of balls A and B remains unchanged or conserved during their collision when no external force acts on them.** This verifies the law of conservation of momentum for a system of two objects.

The result can be generalised for a system consisting of any number of objects interacting with one another.

The law of conservation of momentum can be easily demonstrated by the following activities:

ACTIVITY 2.6

To demonstrate the Law of Conservation of Momentum experimentally

Take a big size rubber balloon and inflate it fully. Tie its neck using a thread. Take a straw and using an adhesive tape, gently fix it on the surface of the balloon. Pass a long thread through the straw. Fix the two ends of the thread on two walls in front of each other as shown in the adjoining figure.

Now, remove the thread tied on the neck of the balloon so that the air escapes from the mouth of the balloon. It is observed that the straw and balloon immediately move in a direction opposite to that of escaping air.

Initially, the balloon filled with air and the straw constituted a system, which was at rest having zero momentum. On removing the thread tied on the neck of the balloon, the escaping air has a definite momentum in one direction and the straw and empty balloon, moving in opposite direction, have equal amount of negative momentum. Thus, total momentum still remains zero, i.e., the total momentum remains conserved.

ACTIVITY 2.7

To demonstrate the Conservation of Momentum

Take a test tube of borosil glass and put a small amount of water in it. Gently place a stopcock at the mouth of test tube.

Using two strings, suspend the test tube horizontally as shown in the adjoining figure. Heat the test tube with a burner. Within few minutes, the water inside the test tube vaporises. The steam formed exerts a pressure on stopcock and the stopcock blows out. Carefully, observe the test tube. It is found to recoil in a direction opposite to the direction of stopcock. The recoil velocity of test tube is less than the forward velocity of stopcock. It is because mass of test tube is much greater than that of stopcock. Recoil motion of test tube demonstrates the conservation of momentum.

Illustrations for the Law of Conservation of Momentum

The law of conservation of momentum is a general law and is applicable to all systems. Let us consider few illustrations of the applications of the law:

1. **Recoil velocity of a gun:** Consider a gun and bullet system. Before firing, it is at rest and total momentum

is zero. At the time of firing, the gun exerts a force F on the bullet and, in turn, the bullet exerts a force $-F$ on the gun. Thus, net force on the gun-bullet system is zero. If the bullet of mass m_1 comes out of the gun with a velocity v_1, then the gun of mass m_2 recoils with a velocity v_2 so as to conserve the momentum of the system.

Fig. 2.27

$\therefore$ Total final momentum of bullet and gun = Total initial momentum of the system

$\therefore$ $$m_1v_1 + m_2v_2 = 0$$

$\Rightarrow$ Recoil velocity of the gun, $$v_2 = -\frac{m_1v_1}{m_2} \quad \text{...(2.10)}$$

The negative sign of v_2 shows that the gun moves in a direction opposite to the direction of motion of the bullet. Moreover, heavier the gun, lesser is the magnitude of its recoil velocity.

2. **A gunman, while firing a bullet, should hold the gun tight to his shoulder:** If a gunman does not hold the gun tight to his shoulder on firing, the gun recoils backwards and gives a jerk to the shoulder of the gunman. Consequently, the gunman may be hurt. To avoid this possibility, the gunman should hold the gun tight to his shoulder.
3. **Motion of a jet aeroplane:** During the flight of a jet plane, the hot gases formed due to burning of fuel escape backwards through a small jet shaped nozzle with high speed. Thus, the escaping gases have large momentum in the backward direction. As no external force is acting on a jet plane, hence, in accordance with the law of conservation of momentum, an equal momentum in forward direction is imparted to the aeroplane and it flies forward.
4. **Propulsion of a rocket:** Before firing, the total momentum of a rocket is zero. When the rocket is fired, fuel in the combustion chamber burns at a quick rate. The hot burnt gases come out downwards from the rear of the rocket with a high velocity and carry large momentum. In accordance with the law of conservation of momentum, an equal momentum is imparted to the rocket in the upward direction and the rocket goes upwards in the sky.
5. **It is difficult for a fireman to hold a hose, which ejects large amounts of water at a high velocity:** When a large amount of water is ejected at a high velocity from a hose of a fireman during a firefighting operation, the ejected water carries a large momentum in the direction of water flow. In accordance with the law of conservation of momentum, the hosepipe must have an equal momentum in backward direction and recoils. To prevent the recoil motion of hosepipe, the fireman has to exert a large force on it. Therefore, it is quite difficult for him to hold a hose in its position.


Fig. 2.28 A rocket going upwards with burnt gases moving downwards

EXAMPLE 2.11: A bullet of mass 10 g is fired horizontally with a velocity 240 m s^{-1} from a pistol of mass 1.2 kg. What is the recoil velocity of the pistol?

SOLUTION: Here, mass of the bullet, m_1 = 10 g = 0.01 kg; mass of the pistol, m_2 = 1.2 kg; initial velocity of the pistol and bullet before firing, u = 0; final velocity of the bullet, v_1 = 240 m s^{-1} and let final velocity of the pistol be v_2.

From the law of conservation of momentum, we have

Total final momentum = Total initial momentum

$\therefore$ $$m_1v_1 + m_2v_2 = (m_1 + m_2)u = (m_1 + m_2) \times (0) = 0$$

$\Rightarrow$ $$v_2 = -\frac{m_1v_1}{m_2} = -\frac{0.01 \times 240}{1.2} = \mathbf{-2.0\ m\ s^{-1}}$$

The negative sign signifies that pistol will recoil in a direction opposite to the direction of motion of bullet.

EXAMPLE 2.12: A stone of mass 2.0 kg, initially at rest, suddenly breaks into two pieces of masses 1.2 kg and 0.8 kg respectively. If the lighter fragment travels with a velocity of 3.0 m s^{-1} due east, then find the velocity and direction of motion of heavier fragment.

SOLUTION: Here, mass of the stone, m = 2.0 kg; initial velocity of the stone, u = 0; mass of the lighter fragment, m_1 = 0.8 kg and its velocity, v_1 = 3.0 m s^{-1} due east; mass of the heavier fragment, m_2 = 1.2 kg and let its velocity be v_2.

Since there is no external force present, the total momentum of the system must remain conserved and hence

$$m_1v_1 + m_2v_2 = (m_1 + m_2)u$$

On substituting values of various terms, we have

$$0.8 \times 3.0 + 1.2 \times v_2 = 2 \times 0 = 0$$

$$\Rightarrow \quad v_2 = -\frac{0.8 \times 3.0}{1.2} = \mathbf{-2.0\ m\ s^{-1}}$$

The negative sign indicates that direction of motion of v_2 is opposite to v_1. Thus, the heavier fragment moves with a velocity of **2.0 m s^{-1} due west.**

EXAMPLE 2.13: An object A of mass 2 kg is moving with a velocity of 3 m s^{-1} along a straight line towards right and collides head on with an object B of mass 1 kg moving in the opposite direction with a velocity of 4 m s^{-1}. The two objects travel with a common velocity after the collision. Calculate the common velocity.

SOLUTION: Here, mass of object A, m_1 = 2 kg; its initial velocity, u_1 = 3 m s^{-1}; mass of object B, m_2 = 1 kg and initial velocity, u_2 = –4 m s^{-1} (u_2 has been taken –ve because its direction is opposite to that of u_1).

Let, after collision, the combination travels with a constant velocity v. Then, from the law of conservation of momentum, we have

$$m_1u_1 + m_2u_2 = (m_1 + m_2)v$$

$$\Rightarrow \quad v = \frac{m_1u_1 + m_2u_2}{(m_1 + m_2)}$$

$$= \frac{2 \times 3 + 1 \times (-4)}{(2 + 1)} = \frac{2}{3}\ \text{m s}^{-1} = \mathbf{0.67\ m\ s^{-1}}$$

As sign of v is +ve, so its direction is towards right along the given straight line.

EXAMPLE 2.14: A girl of mass 40 kg jumps with a horizontal velocity of 5 m s^{-1} onto a stationary cart with frictionless wheels. The mass of the cart is 3 kg. What is her velocity as the cart starts moving? Assume that there is no external unbalanced force working in the horizontal direction.

[NCERT Solved Example, CCE 2012]

SOLUTION: Here, mass of a girl, m_1 = 40 kg; initial horizontal velocity of a girl, u_1 = 5 m s^{-1}; mass of the cart, m_2 = 3 kg and initial velocity of the cart, u_2 = 0

Let the final velocity of a girl and the cart be v. Since, there is no external unbalanced force in horizontal direction, hence from the law of conservation of momentum,

$$m_1u_1 + m_2u_2 = (m_1 + m_2)v$$

$$\Rightarrow \quad v = \frac{m_1u_1 + m_2u_2}{(m_1 + m_2)}$$

$$= \frac{40 \times 5 + 3 \times 0}{(40 + 3)} = \frac{40 \times 5}{43} = \mathbf{4.65\ m\ s^{-1}}$$

Thus, the girl on the cart would move with a velocity of 4.65 m s^{-1} in the same direction in which she jumped.

Numericals for trial:

1. A 60g bullet fired from a 5 kg gun leaves with a speed of 500 m/s. Find the speed (velocity) with which the gun recoils.
2. A body of mass 2 kg is at rest. What should be the magnitude of force which will make the body move with a speed of 30 m/s at the end of 1s?
3. A 10g bullet travelling at 200 m/s strikes and remains embedded in a 2 kg target which is originally at rest but free to move. At what speed does the target move off?
4. For how long should a force of 100 N act on a body of 20 kg so that it acquires a velocity of 100 m/s?
5. The velocity of a body of mass 10 kg increases from 4 m/s to 8 m/s when a force acts on it for 2s.
   (a) What is the momentum before the force acts?
   (b) What is the momentum after the force acts?
   (c) What is the gain in momentum per second?
   (d) What is the value of the force.
6. A 1000 kg vehicle moving with a speed of 20 m/s is brought to rest in a distance of 50 metres:
   (i) Find the acceleration
   (ii) Calculate the unbalanced force acting on the vehicle.

.....END.....

HINDI

By- Pratibha Mishra

CBSE कक्षा 9 हिंदी-A क्षितिज
पाठ-9 साखियाँ एवं सबद
पुनरावृत्ति नोट्स

कबीर-साखियाँ

महत्वपूर्ण बिन्दु-

1. कबीर द्वारा रचित साखियों में प्रेम का महत्त्व ,संत के लक्षण,ज्ञान की महिमा,बाहयाडंबरों का विरोध आदि भावों का उल्लेख हुआ है।
2. कबीरदास जी कहते हैं कि मन रूपी सरोवर आत्मानंद रूपी जल से भरा हुआ है,जिसमें साधक रूपी हंस मुक्ति रूपी दाने चुगता रहता है तब उसे कहीं और भटकने की आवश्यकता नहीं पड़ती है अर्थात उसे वापस सांसारिक मायामोह में नहीं पड़ना पड़ता। इसमें दोहा छंद, सधुक्कड़ी भाषा,रूपक,अनुप्रास तथा श्लेष अलंकार का प्रयोग है।
3. कवि प्रेमी अर्थात ईश्वर को जगह-जगह खोजता फिरता है लेकिन वह उसे कहीं नहीं मिलता,किन्तु जब उसका मिलन ईश्वर से हो जाता है,तब सारे विकार शांत हो जाते हैं,अर्थात ईश्वर की प्राप्ति हो जाने पर विष अमृत में बदल जाता है।
4. ज्ञान का महत्त्व बताते हुए कबीरदास जी कहते हैं किज्ञान रूपी हाथी की सवारी करने के लिए सहज साधना रूपी गलीचा बिछाना चाहिए,यह संसार कुत्ते के समान है जो व्यर्थ में भौंकता रहता है। अर्थात सामान्य लोग साधकों का मज़ाक उड़ाते रहते है । रूपक अलंकार का प्रयोग किया गया है।
5. पक्ष-विपक्ष के कारण यह संसार ईश्वर को भूल जाता है,जब कि जो निष्पक्ष होकर ईश्वर को भजता है वही सच्चा संत कहलाता है,अर्थात ईश्वर की एकाग्र भाव से उपासना करने वाला ही ज्ञानी कहलाता है। अनुप्रास अलंकार का सुंदर प्रयोग है।
6. कबीरदास जी कहते है कि जिस ईश्वर को हिन्दू राम कह कर पूजते हैं और उसी भगवान को मुसलमान खुदा कहते हैं। कवि के अनुसार वही बुद्धिमान है जो उन दोनों के ही निकट नहीं जाता है,अर्थात एक निष्ठ भाव से बिना भेदभाव के ईश्वर की भक्ति करता है।
7. कवि कहते हैं कि जिनके मन में धर्म को लेकर कोई भेदभाव नहीं होता उनके लिए काबा ही काशी बन जाता है और राम रहीम बन जाता है अर्थात उनकी नज़र में सभी धर्म एकसमान होते हैं । जैसे मोटे आटे को पीसने पर वह मैदा का रूप ले लेता है किन्तु रहता तो वह आटा ही है उसी प्रकार धर्म चाहे कोई भी हो लक्ष्य सबका एक ही है।
8. ऊँचे कुल में जन्म लेने से कोई लाभ नहीं है यदि कर्म अच्छे नहीं हैं। जैसे सोने के कलश में यदि शराब भरी हो तब भी वह निंदा का कारण ही बनती है अर्थात व्यक्ति को ऊँचा बनने के लिए करनी भी अच्छी होनी चाहिए केवल ऊँचे कुल में जन्म लेना पर्याप्त नहीं ।

CBSE Class 09 Hindi Course A

NCERT Solutions

क्षितिज पाठ-09 कबीर

1. 'मानसरोवर' से कवि का क्या अभिप्राय है ?

उत्तर:- मानसरोवर से कवि का अभिप्राय है - मनरूपी पवित्र सरोवर, जिसमें स्वच्छ विचारधारा रूपी जल भरा है तथा हंस रूपी जीवात्मा प्रभु भक्ति में लीन होकर मुक्तिरूपी मुक्ताफल चुगती है अर्थात आत्मा इस सांसारिक माया -मोह के चक्कर में न पड़कर ईश्वर की शरण में जाना चाहती है।

2. कवि ने सच्चे प्रेमी की क्या कसौटी बताई है ?

उत्तर:- कवि ने सच्चे प्रेमी की कसौटी बताते हुए यह बताया है कि सच्चे प्रेमी अर्थात् ईश्वर को प्राप्त करने के लिए आवश्यक है कि उसको इधर- उधर न ढूँढ कर अपने भीतर हृदय में ढूँढना चाहिए,उस ईश्वर को पाते ही सारे विकार दूर हो जाते हैं,मन प्रसन्न हो जाता है।

3. तीसरे दोहे में कवि ने किस प्रकार के ज्ञान को महत्त्व दिया है ?

उत्तर:- तीसरे दोहे में कवि ने अनुभव से प्राप्त ज्ञान को महत्त्व दिया है जो सहज साधना से प्राप्त होता है।कबीर ने इस प्रकार के ज्ञान को हस्ती के समान बताया है।इसे पाने के बाद उसका साक्षात्कार ईश्वर से सहज हो जाता है।

4. इस संसार में सच्चा संत कौन कहलाता है ?

उत्तर:- कबीर के अनुसार सच्चा संत वही कहलाता है जो साम्प्रदायिक भेदभाव, सांसारिक मोह माया से दूर, सभी स्थिति में समभाव (सुख दुःख, लाभ-हानि, ऊँच-नीच, अच्छा-बुरा) से रहते हुए निश्छल भाव से प्रभु भक्ति में लीन रहता है।

5. अंतिम दो दोहों के माध्यम से से कबीर ने किस तरह की संकीर्णता की ओर संकेत किया है ?

उत्तर:- अंतिम दो दोहों में दो तरह की संकीर्णता की ओर संकेत किया है -

1. अपने धर्म को श्रेष्ठ सिद्ध करना और दूसरे के धर्म की निंदा करना।
2. ऊँचे कुल में जन्म लेने से स्वयं को श्रेष्ठ समझना, मनुष्य केवल ऊँचे कुल में जन्म लेने से बड़ा नहीं होता बल्कि वह अपने अच्छे कर्मों से बड़ा बनता है।

6. किसी भी व्यक्ति की पहचान उसक कुल से होती है या कर्मों से? तर्क सहित उत्तर दीजिए।

उत्तर:- राम, कृष्ण, बुद्ध, महावीर आदि महापुरुष केवल ऊँचे कुल में जन्म लेने के कारण महान नहीं बनें बल्कि वे महान बने तो अपने उच्च कर्मों से। इसके विपरीत कबीर, सूर, तुलसी बहुत ही सामान्य घरों में पैदा हुए परन्तु संसार भर में अपने सद्कर्मों के

कारण प्रसिद्ध हुए। अत: हम कह सकते हैं कि व्यक्ति की पहचान उसके कर्मों से होती है, कुल से नहीं।

7. काव्य सौंदर्य स्पष्ट कीजिए -

हस्ती चढ़िये ज्ञान कौ, सहज दुलीचा डारि।

स्वान रूप संसार है, भूँकन दे झख मारि।

उत्तर:- भाव सौंदर्य - यहाँ पर कवि ने ज्ञान के महत्त्व को प्रतिपादित करते हुए बताया है कि ज्ञान की प्राप्ति के लिए दृढ़ता तथा सहज साधना आवश्यक है, संसार रूपी कुत्ते अर्थात् आलोचना करनेवाले भौंक-भौंककर शांत हो जाते हैं।

शिल्प सौंदर्य - रचना में भक्ति रस की प्रधानता है। सधुक्कड़ी भाषा,दोहा छन्द का प्रयोग किया गया है।

हस्ती, स्वान, ज्ञान आदि तत्सम शब्दों तथा रूपक अलंकार का प्रयोग हुआ है।

8. मनुष्य ईश्वर को कहाँ-कहाँ ढूँढता फिरता है ?

उत्तर:- मनुष्य ईश्वर को मंदिर-मस्जिद,देवालयों,काबा,काशी-कैलाश जैसे पवित्र तीर्थ स्थलों और योग,वैराग्य यज्ञ,पूजा-पाठ तथा विभिन्न प्रकार के धार्मिक क्रिया-कलापों में खोजता फिरता है ।

9. कबीर ने ईश्वर प्राप्ति के लिए किन प्रचलित विश्वासों का खंडन किया है ?

उत्तर:- कबीर ने ईश्वर प्राप्ति के लिए प्रचलित विश्वास जैसे मंदिर, मस्जिद में जाकर पूजा अर्चना करना या नमाज पढ़ना अथवा योग, वैराग्य जैसी क्रियाएँ करना,पवित्र तीर्थ स्थलों की यात्रा करना,आडम्बर युक्त भक्ति करके ईश्वर प्राप्ति की इच्छा करना इन सभी प्रचलित मान्यताओं का खंडन किया है।

10. कबीर ने ईश्वर को सब स्वाँसों की स्वाँस में क्यों कहा है?

उत्तर:- सभी जीवों की रचना ईश्वर के द्वारा की गयी है। अत: ईश्वर का वास हर प्राणी की हर साँस में है अर्थात् ईश्वर संसार के कण-कण में समाया है। इसलिए कबीर ने ईश्वर को सब स्वाँसों की स्वाँस में कहा है।

SOCIAL STUDIES

HISTORY

BY- SHUBHRA GHOSH

CHAPTER -3 NAZISM AND THE RISE OF HITLER

SOCIAL STUDIES

STUDY LINK- https://www.youtube.com/watch?v=8UVB0AD016I

Study the above link thoroughly ⇧

NOTES FOR CHAPTER -3

Birth of the Weimar Republic

In the early years of the twentieth century, Germany fought the First World War (1914-1918) alongside the Austrian empire and against the Allies (England, France and Russia.). All resources of Europe were drained out because of the war. Germany occupied France and Belgium. But, unfortunately, Allies, strengthened by the US entry in 1917, won, defeating Germany and the Central Powers in November 1918. At Weimar, the National Assembly met and established a democratic constitution with a federal structure. In the German Parliament, deputies were elected on the basis of equal and universal votes cast by all adults including women. Germany lost its overseas colonies. The War Guilt Clause held Germany responsible for the war and damages the Allied countries suffered. The Allied armies occupied Rhineland in the 1920s.

The Effects of the War

The entire continent was devastated by the war both psychologically and financially. The war of guilt and national humiliation was carried by the republic and was financially crippled by being forced to pay compensation. Socialists, Catholics and Democrats, supported the Weimar Republic and they were mockingly called the 'November criminals'. The First World War left a deep imprint on European society and polity. Soldiers are placed above civilians but unfortunately, soldiers lived a miserable life. Democracy was a young and fragile idea, which could not survive the instabilities of interwar Europe.

Political Radicalism and Economic Crises

The Weimar Republic birth coincided with the revolutionary uprising of the Spartacist League on the pattern of the Bolshevik Revolution in Russia. They crushed the uprising with the help of a war veterans organisation called Free Corps. Communists and Socialists became enemies. Political radicalisation heightened by the economic crisis of 1923. Germany refused to pay, and the French occupied its leading industrial area, Ruhr, to claim their coal. The image of Germans carrying cartloads of currency notes to buy a loaf of bread was widely publicised evoking worldwide sympathy. This crisis came to be known as hyperinflation, a situation when prices rise phenomenally high.

The Years of Depression

The years between 1924 and 1928 saw some stability. The support of short-term loans was withdrawn when the Wall Street Exchange crashed in 1929. Great Economic Depression started and over the next three years, between 1929 and 1932, the national income of the USA fell by half. The economy of Germany was the worst hit. Workers became jobless and went on streets with placards saying, 'Willing to do any work'. Youth indulged themselves in criminal activities. The middle class and small businessmen were filled with the fear of proletarianisation, anxiety of being reduced to the

ranks of the working class or unemployment. Politically also the Weimar Republic was fragile. The Weimar constitution due to some inherent defects made it unstable and vulnerable to dictatorship. One inherent defect was proportional representation. Another defect was Article 48, which gave the President the powers to impose emergency, suspend civil rights and rule by decree.

Hitler's Rise to Power

Hilter rose to power. He was born in 1889 in Austria and spent his youth in poverty. In the First World War, he enrolled for the army, acted as a messenger in the front, became a corporal, and earned medals for bravery. Hitler joined a small group called the German Workers' Party in 1919. He took over the organisation and renamed it the National Socialist German Workers' Party, which later came to be known as the Nazi Party. In 1923, he planned to seize control of Bavaria, march to Berlin and capture power. During the Great Depression, Nazism became a mass movement. After 1929, banks collapsed, businesses shut down, workers lost their jobs and the middle classes were threatened with destitution. In such a situation, Nazi propaganda stirred hopes of a better future.

Hitler was a powerful speaker and his words moved people. In his speech, he promised to build a strong nation, undo the injustice of the Versailles Treaty and restore the dignity of the German people. He also promised employment for those looking for work and a secure future for the youth. He promised to weed out all foreign influences and resist all foreign 'conspiracies' against Germany. Hitler started following a new style of politics and his followers held big rallies and public meetings to demonstrate support. According to the Nazi propaganda, Hitler was called a messiah, a saviour, as someone who had arrived to deliver people from their distress.

The Destruction of Democracy

President Hindenburg offered the Chancellorship, on 30 January 1933, the highest position in the cabinet of ministers, to Hitler. The Fire Decree of 28 February 1933 suspended civic rights like freedom of speech, press and assembly that had been guaranteed by the Weimar constitution. On 3 March 1933, the famous Enabling Act was passed which established dictatorship in Germany. The state took control over the economy, media, army and judiciary. Apart from the already existing regular police in green uniform and the SA or the Storm Troopers, these included the Gestapo (secret state police), the SS (the protection squads), criminal police and the Security Service (SD).

Reconstruction

Economic recovery was assigned to the economist Hjalmar Schacht by Hitler who aimed at full production and full employment through a state-funded work-creation programme. This project produced the famous German superhighways and the people's car, the Volkswagen. Hitler ruled out the League of Nations in 1933, reoccupied the Rhineland in 1936, and integrated Austria and Germany in 1938 under the slogan, One people, One empire, and One leader. Schacht advised Hitler against investing hugely in rearmament as the state still ran on deficit financing.

The Nazi Worldview

Nazis are linked to a system of belief and a set of practices. According to their ideology, there was no equality between people, but only a racial hierarchy. Racism of Hitler borrowed from thinkers like Charles Darwin and Herbert Spencer. The argument of Nazi was simple: the strongest race would survive and the weak ones would perish. The Aryan race was the finest who retained its purity, became stronger and dominated the world. The other aspect of Hitler's ideology related to the geopolitical concept of Lebensraum, or living space. Hitler intended to extend German boundaries by moving eastwards, to concentrate all Germans geographically in one place.

Establishment of the Racial State

Nazis came into power and quickly began to implement their dream of creating an exclusive racial community of pure Germans. They wanted a society of ‘pure and healthy Nordic Aryans’. Under the Euthanasia Programme, Helmuth’s father had condemned to death many Germans who were considered mentally or physically unfit. Germany occupied Poland and parts of Russia, captured civilians and forced them to work as slave labour. Jews remained the worst sufferers in Nazi Germany. Hitler hated Jews based on pseudoscientific theories of race. From 1933 to 1938 the Nazis terrorised, pauperised and segregated the Jews, compelling them to leave the country.

The Racial Utopia

Genocide and war became two sides of the same coin. Poland was divided and much of north-western Poland was annexed to Germany.

People of Poland were forced to leave their homes and properties. Members of the Polish intelligentsia were murdered in large numbers, polish children who looked like Aryans were forcibly snatched from their mothers and examined by ‘race experts’.

Youth in Nazi Germany

Hitler was interested in the youth of the country. Schools were cleansed and purified. Germans and Jews were not allowed to sit or play together. In the 1940s Jews were taken to the gas chambers. Introduction of racial science to justify Nazi ideas of race. Children were taught to be loyal and submissive, hate Jews, and worship Hitler. Youth organisations were responsible for educating German youth in ‘the spirit of National Socialism’. At the age of 14, boys had to join the Nazi youth organisation where they were taught to worship war, glorify aggression and violence, condemn democracy, and hate Jews, communists, Gypsies and all those categorised as ‘undesirable’. Later, they joined the Labour Service, at the age of 18 and served in the armed forces and enter one of the Nazi organisations. In 1922, the Youth League of the Nazis was founded.

The Nazi Cult of Motherhood

In Nazi Germany, children were told women were different from men. Boys were taught to be aggressive, masculine and steel hearted and girls were told to become good mothers and rear pure-blooded Aryan children. Girls had to maintain purity of the race, distance from Jews, look after their home and teach their children Nazi values. But all mothers were not treated equally. Honours Crosses were awarded to those who encouraged women to produce more children. Bronze cross for four children, silver for six and gold for eight or more. Women who maintained contact with Jews, Poles and Russians were paraded through the town with shaved heads, blackened faces and placards hanging around their necks announcing ‘I have sullied the honour of the nation’.

The Art of Propaganda

Nazis termed mass killings as special treatment, final solution (for the Jews), euthanasia (for the disabled), selection and disinfections. ‘Evacuation’ meant deporting people to gas chambers. Gas chambers were labelled as ‘‘disinfection-areas’, and looked like bathrooms equipped with fake showerheads. Nazi ideas were spread through visual images, films, radio, posters, catchy slogans and leaflets. Orthodox Jews were stereotyped and marked and were referred to as vermin, rats and pests. The Nazis made equal efforts to appeal to all the different sections of the population. They sought to win their support by suggesting that Nazis alone could solve all their problems.

Ordinary People and the Crimes Against Humanity

People started seeing the world through Nazi eyes and spoke their Nazi language. They felt hatred and anger against Jews and genuinely believed Nazism would bring prosperity and improve general well-being. Pastor Niemoeller protested an uncanny silence, amongst ordinary Germans against

brutal and organised crimes committed in the Nazi empire. Charlotte Beradt's book called the Third Reich of Dreams describes how Jews themselves began believing in the Nazi stereotypes about them.

Knowledge about the Holocaust

The war ended and Germany was defeated. While Germans were preoccupied with their own plight, the Jews wanted the world to remember the atrocities and sufferings they had endured during the Nazi killing operations – also called the Holocaust. When they lost the war, the Nazi leadership distributed petrol to its functionaries to destroy all incriminating evidence available in offices.

NOTE- ALL THE QUESTION ANSWERS TO BE DONE IN YOUR SST COPY

Question 1:

Describe the problems faced by the Weimar Republic.

ANSWER:

The problems faced by the Weimar Republic were present from its very inception. The Versailles Peace Treaty at the end of the First World War dispossessed Germany of its territories, its resources and its pride as a nation. In spite of the harsh terms, the Weimar Republic accepted the humiliating treaty, thereby making it unpopular amongst the German masses.

The German state was financially crippled due to overwhelming war debts which had to be paid in gold. The French occupied Germany's chief industrial area—the Ruhr—to exact debts when the Weimar government refused to pay. The uninhibited printing of paper money caused the value of the German mark to fall considerably, thereby causing hyperinflation. When the Great Economic Depression occurred, the German economy was the worst hit because USA—which had been bailing it out of debts—discontinued its monetary support.

The Weimar Republic was weak due to inherent constitutional irregularities such as proportional representation and Article 48 (which gave the President the power to impose emergency and rule by decree). The democratic parliamentary system seemed to give the people no solutions or benefits in the times of the severe economic crisis. Thus, beset with political and economic problems, the German people lost confidence in the Weimar Republic.

Question 2:

Discuss why Nazism became popular in Germany by 1930.

ANSWER:

Nazism became popular in Germany by 1930 on account of various reasons. The most apparent being the Great Depression. The Weimar Republic did little to remedy the country's economic downfall, and Hitler was presented as a saviour to the humiliated German people living in economic and political crises. Nazi propaganda stirred hopes in times when banks were shut down, unemployment reigned and destitution was a common sight. At such a time, Hitler promised jobs, restoration of national dignity and a better future. Consequently, by 1932, the Nazi Party became the largest party with 37% votes in the Reichstag.

Question-3

What are the peculiar features of Nazi thinking?

Solution:

Nazi ideologies were …

a. There is no equality among people.
b. The Nordic German Aryans were the best race.
c. the Jews were considered the lowest race.
d. Nazism believed in the survival of the fittest.
e. New territories had to be captured to enhance the motherland.
f. New territories would enhance natural resources and make Germany a powerful nation.

When the Nazi Party came to power it began to implement these ideologies.

Question-4

Explain why Nazi propaganda was effective in creating a hatred for Jews.

Solution:

1) Films were made to create hatred for the Jews. The film, 'The Eternal Jew', showed the Jews with flowing beards and dressed in kaftans.
2) The Jews were referred to as vermin, rats and pests. The Nazi propaganda compared the Jews to rodents.
3) Orthodox Jews were stereotyped as killers of Christ and money lenders.
4) Children were taught to hate the Jews.
5) The Nazi propaganda against the Jews was so effective that people felt anger and hatred surge inside them when they saw someone who looked like a Jew.

5) What is hyperinflation? Why did this situation occur in Germany in 1923?

ANSWER

Hyperinflation is a situation when prices rise phenomenally high. This situation occurred in Germany in 1923 due to several reasons:
(i) Germany had fought the First World War largely on loans and had to pay the war compensation in gold. This depleted gold reserves at a time resources were scarce.
(ii) When Germany refused to pay the war compensation, France occupied its leading industrial area, Ruhr, to claim their coal.
(iii) Germany retaliated with passive resistance and printed paper currency recklessly. With too much printed money in circulation, the value of the German Mark fell. As a result, prices of goods soared. The image of Germans carrying cartloads of currency notes to buy a loaf of bread was widely publicised. This crisis came to be known as hyperinflation.

6) What promises did Hitler make to the German people? How did he mobilise them?

ANSWER

(i) Hitler promised to build a strong nation, undo the injustice of the Versailles Treaty and restore the diginity of the German people.
(ii) He promised employment for those looking for work, and a secure future for the youth.
(iii) He promised to weed out all foreign influences and resist all foreign 'conspiracies' against Germany.
In order to mobilise German people Hitler held massive rallies and public meetings. The Red banners with the Swastika, the Nazi salute and the ritualised rounds of applause after the speeches left deep influence on the minds of German people.

7) What were the provisions of the famous Enabling Act?

ANSWER

The famous Enabling Act was passed on 3 March 1933. The provisions of this Act are given below:
(i) The Act established Hitler's dictatorship in Germany.
(ii) It gave Hitler all powers to sideline Parliament and rule by decree.
(iii) All political parties and trade unions were bannga except for the Nazi party and its affiliates.
(iv) The state established complete control over the economy, media, army and judiciary.
(v) Special surveillance and security forces were created to control and order society in ways that the Nazis wanted.

8)What happened in schools under Nazism?

ANSWER

1) Jews teachers were dismissed Children were first segregated. German and Jews could not sit together or play together.

2) Subsequently, 'undesirable children' i.e. Jews, the physically handicapped and Gypsies were thrown out of schools.

3) German children were subjected to a process of Nazi schooling, a prolonged period of ideological training.

4) School textbooks were re-written. Racial science was introduced to justify Nazi ideas of race.

5) Stereotypes about Jews were popularised even through math classes. Children were taught to be loyal and submissive, hate Jews and worship Hitler.

6) Even the function of sports was to nurture a spirit of violence and aggression among children.

Very short type answers-

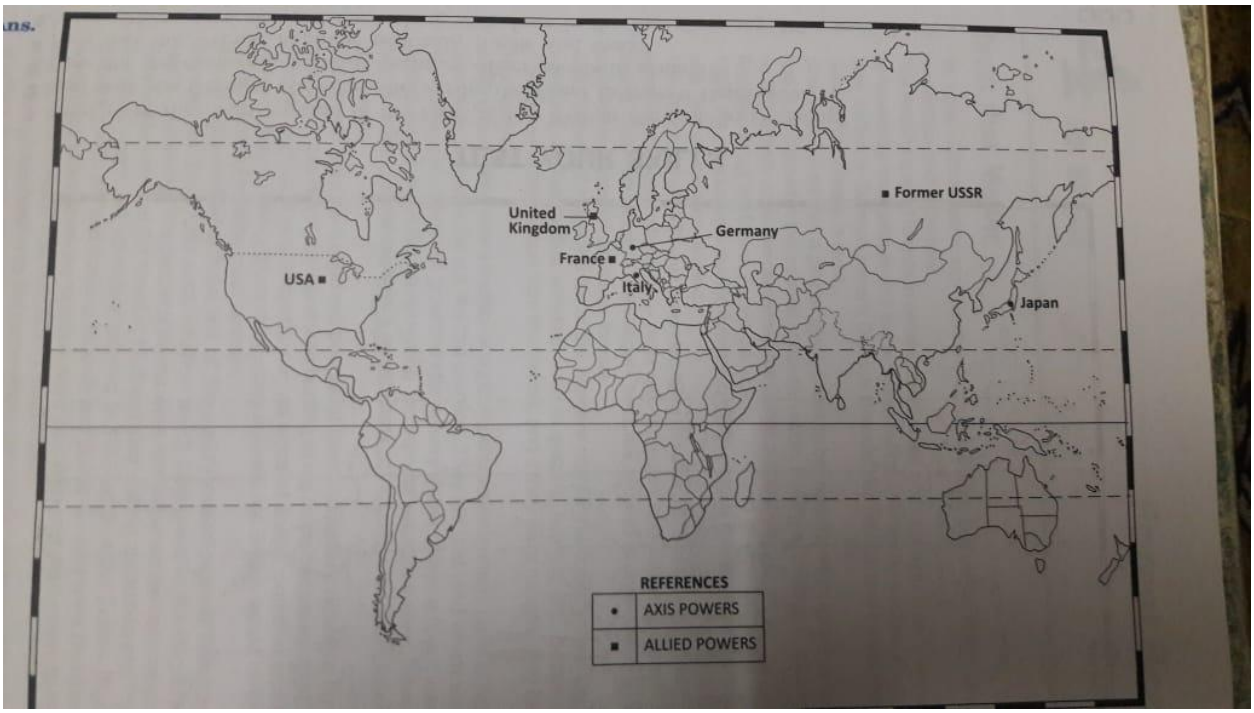
1) What was the name given to mass killings of the Jews under Hitler's regime?
   Ans) Special treatment.
2) Name the incident that started the second world war.
   Ans) Germany's attack on Poland.
3) When was Enabling Act passed in Germany?
   Ans) 3 March 1933
4) What was Auschwitz famous for?
   Ans) Centre for mass killing during Nazi Germany.
5) On 30 January 1933 who offered the Chancellorship to Hitler?
   Ans) President Hindenburg
6) Who was Hjalmar Schacht?
   Ans) Economist
7) Which party came to be known as the Nazi Party?
   Ans) National Socialist German Workers' Party.
8) What were ghettos?
   Ans) Areas where Jews lived.
9) What does the Reichstag means?
   Ans) German Parliament.
10) What is meant by a genocidal war?
    Ans) A genocidal war is a war which results in the mass killing leading to destruction of large sections of people.
11) What do you know about Wall Street Exchange?
    Ans) World's biggest stock exchange located in the USA.
12) Who were the worst sufferers in Nazi Germany?
    Ans) Jews.
13) Mention two promises made by Hitler.
    Ans) i) build a strong nation.
    ii) undo the injustice of the Versailles Treaty.
14) When was Youth League of the Nazis founded? What was it renamed four years later?
    Ans) The Youth League of the Nazis was founded in 1922. Four years later it was renamed as Hitler Youth.

Map question-

On an outline map of the world locate and label the following major countries of the Second World War.

Axis Powers: Germany,Italy,Japan

Allied Powers: UK,France, Former USSR, USA.



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