

Instructions:

1. Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
2. Use Black or Blue ink to write and pencil to draw diagrams.

Note: This question paper contains three sections.

SECTION - I

(15 X 1 = 15)

- i) Answer all the 15 questions
- ii) Choose the correct answer from the alternatives given in the brackets.

1. In a pea plant, the yellow colour of the seed dominates over the green colour. The genetic make up of the green colour of the seed can be shown as _____ (yy, Yy, GG, Gg)

2. Amoebiasis is caused by _____

[A(H₁ N₁), Microsporium, Entamoeba histolytica, Epidermophyton]

3. Pick out the item which has sequential arrangement.

- i) Leptotene -> Pachytene -> zygotene -> Diplotene -> Diakinesis
- ii) Leptotene -> zygotene -> Pachytene -> Diplotene -> Diakinesis
- iii) Leptotene -> Diakinesis -> zygotene -> Pachytene -> Diplotene

4. Anemochory occurs in _____.

(Lotus, Balsam, Coconut, Tridax)

5. Based on relationship, fill up:

Whale: Flippers

Bat : _____

6. The roots of a coconut tree are seen growing far from the plant. Such a kind of movement of root for want of water is _____.

(Phototropism, Geotropism, Chemotropism, Hydrotropism)

7. Assertion (A) : Coal and petroleum are called fossil fuels.

Reason (R) : Fossil fuels are formed from the remains of dead organisms after millions of years.

- i) Both 'A' and 'R' are true and 'R' explains 'A'.
- ii) Both 'A' and 'R' are true and but 'R' doesn't explain 'A'
- iii) Only 'A' is true but 'R' is false.
- iv) 'A' is false but 'R' is true.

8. _____ is the chief component of natural gas.

(Ethane, methane, propane, butane)

9. The phenomenon by which colloidal particles scatter light is called _____ (Tyndall effect, reflection, refraction)

10. The pH range of neutral solution is _____ (equal to 7, greater than 7, lesser than 7)

11. Coating the surface of iron with other metal prevents it from rusting. If it is coated with a thin layer of zinc, it is called _____ (galvanization, painting, cathodic protection)

12. IUPAC name of the first member of alkene is _____

(ethylene, ethyne, acetylene, ethene)

13. The freezing of biotechnology products like vaccines requires _____ freezing system (Helium, Nitrogen, Ammonia, Chlorine)

14. The atomic number of natural radioactive element is _____
(Greater than 82, less than 82, not defined, at least 82)
15. The magnification produced by a mirror is + 1/3. Then the mirror is a _____ (Concave mirror, Convex mirror , plane mirror)

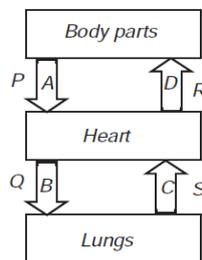
SECTION - II

Note: Answer any twenty questions. 20 x 2 = 40

16. The inheritable characters vary in different species and within the same species. Name the variation in the following cases.
- i) The dentition in the rabbit and the elephant are not the same. This is called as _____ variation.
- ii) The eye colour among the human beings are varied as blue, black, brown, green, etc. This is called as _____ variation.
17. Name the different species of mankind in chronological order from primitive to modern man.
18. Define Genetic Engineering
19. Pick out the odd ones:
- i) **AIDS** : Retro virus, lymphocytes, BCG, ELISA
- ii) **Bacterial disease** : Rabies, cholera, common cold, influenza
- iii) **DPT vaccine** : Diphtheria, tuberculosis, pertusis, tetanus
- iv) **Infective stage of Plasmodium in humans**: Sporozoites, merozoites, trophozoites, gametocytes.
20. Match the following:

List I	List II
A. Vasopressin	I. Resist infection
B. Insulin	II. Diabetes insipidus
C. Oxytocin	III. Diabetes mellitus
D. Thymosin	IV. contraction and relaxation of uterus

21. Differentiate dry dehiscent fruits and dry indehiscent fruits with suitable examples.
22. Observe the following flow-chart depicting blood-circulation in mammals.

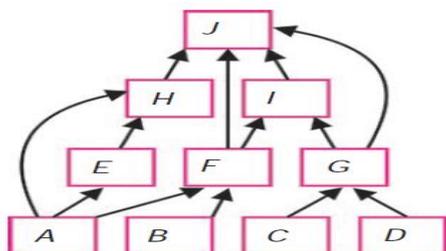


- i) Pick out the correct blood vessels A,B,C,D from the following:
(Pulmonary veins , Venacava , pulmonary artery, Aorta)
- ii) Among the P,Q,R and S samples, identify the correct match from the following
- a) P & Q = Oxygenated and R & S = Deoxygenated
- b) P & Q = Deoxygenated and R & S = oxygenated
- c) All are Oxygenated
- d) All are Deoxygenated
23. Draw and label the diagram of Nephron.
24. Fill in the blanks.
- i. Milk producing glands are modified _____
(Endocrine gland / Sweat gland)
- ii. Mammals are _____. (Warm blooded / Cold blooded)

- iii. A thin transparent membrane called _____ covers the kidney. (Meninges / Capsule)
- iv. The heart is covered by a protective double layered membrane called _____ (Pericardium / Pleura)
25. Differentiate aerobic respiration from anaerobic respiration. Mention the event that is common to both.
26. What is photosynthesis? Write a balanced equation for this bio-chemical reaction.
27. Match the methods of nutrition of special organs with suitable examples:

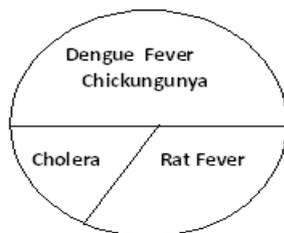
Autotrophs	Mycorrhiza	Cuscutta
Parasites	Chlorophyll	Monotropa
Saprophytes	Haustoria	Hibiscus

28. Observe the following food web:



- (i) Find out the wrong statement:
- a) 'A' is a producer b) 'F' is a herbivore
 c) 'H' is an omnivore d) 'I' is a climax carnivore
- (ii) Find out how many food chains are present in the above food web.

29. The pie diagram represents a survey result of infectious diseases in a village during 2008 – 2009. Analyse it and answer the following:



- i) Which diseases affect the majority of the population?
 ii) How are these diseases transmitted?
 iii) Mention any three measures that can control the other two diseases.

30. Match the following:

<i>Water borne diseases</i>	<i>Water related diseases</i>	<i>Water based diseases</i>
Typhoid	Dengue	Scabies
Malaria	Amoebiasis	Cholera
Filariasis	Lice	Trachoma

31. Pick out the appliances that can conserve electric energy.

Florescent bulbs, copper choke, solar water heater,
 Electric water heater, tungsten bulbs, electronic choke

32. Find the concentration of a solution in terms of weight percentage, if 20gm of common salt is dissolved in 50gm of water.
33. a) Which gas is dissolved in soft drinks?
 b) What will you do to increase the solubility of this gas?
34. Find out the gram molecular mass of
- a) Sulphuric acid b) Carbon-dioxide

35. Two acids (A) & (B) were kept in beakers. Acid (A) undergoes partial dissociation in water, whereas acid (B) undergoes complete dissociation in water.
- Of the two acids (A) & (B), which is weak acid and which is strong acid?
 - What is a weak acid?
 - What is a Strong acid?
 - Give one example each.
36. $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
- Name the chemical reaction.
 - The reaction is exothermic. What is it?
 - Differentiate exothermic reaction and endothermic reaction
 - What happens when the temperature of the solution as the chemicals react?
37. Answer the following:
- What is the percentage of gold present in "Hall mark gold"?
 - What is the meaning of chalcogens?
 - Name the metal present in chlorophyll.
 - What happens when iron is exposed to moist air? Write the composition of the substance.

38. Connect the following metallurgical steps with the extraction of metals in the correct order.

[Roasting, bessemerisation, Hall's process, smelting, calcination, gravity separation, froth floatation process]

Metal	Step1	Step2	Step3	Step4	Step 5
Al					
Cu					
Fe					

39. An organic compound (A) is widely used as a preservative in pickles and has a molecular formula $\text{C}_2\text{H}_4\text{O}_2$. This compound reacts with ethanol to form a sweet smelling compound B.
- Identify the compounds A and B.
 - Name the process and write the corresponding chemical equation.
40. Which would require a greater force for accelerating a 2kg of mass at 4ms^{-2} or a 3kg mass at 2ms^{-2} ?
41. If an angel visits an asteroid called B 612 which has a radius of 20m and mass of 104kg, what will be the acceleration due to gravity in B 612?
42. How many electrons flow through an electric bulb every second, If the current that passes through the bulb is 1.6A
43. Correct the mistakes, if any, in the following statements.
- A good source of energy would be one which would do a small amount of work per unit volume of mass.
 - Any source of energy we use to do work is consumed and can be used again.
44. Fuse wire is made up of an alloy of _____ which has high resistance and _____.
45. Does magnetic monopole exist? Give reason.
46. Write down the names of the specified parts of the human eye.
- Dark muscular diaphragm that controls the pupil _____
 - The screen where the image is formed by the eye lens _____
47. You know that myopia is a common refractive defect of vision.
- A person with this defect can clearly see only objects that are near using concave lens of suitable power this defect is corrected.
- Mention the other two types of defects
 - Explain how they can be corrected.

SECTION - III

Note: i. Answer any **four** questions by choosing one question from each part.

ii. Each question carries **five marks**

iii. Draw diagrams wherever necessary.

PART - I

48. Kala has delivered a baby,
- Suggest the immunization schedule for the baby, in the first six months.
 - What are the diseases that can be cured as per the schedule?
49. Describe the structure of a neuron with the help of a neat, labeled diagram.

PART – II

50. Write the two events involved in the sexual reproduction of a flowering plant.
- Discuss the first event and write the types.
 - Mention the advantages and the disadvantages of that event.
51. In your locality people are affected due to water scarcity. What measures will you take to deal with the problem of water scarcity?

PART – III

52. 100g of calcium was extracted from 174g of calcium oxide.
(Atomic mass of Ca = 40, O=16)
- What mass of oxygen is there in 174g of calcium oxide?
 - How many moles of oxygen atoms are there in this?
 - How many of calcium atoms are there in 100g of Ca?
 - What mass of calcium will be obtained from 1000g of calcium oxide?
53. An organic compound 'A' of molecular formula $C_2H_4O_2$ gives brisk effervescence with sodium bicarbonate solution. Sodium salt of (A) on treatment with soda lime gives a hydro carbon 'B' of molecular mass 30 amu. It belongs to the first member of the alkane family. What are 'A' and 'B' and how will you prepare 'A' from ethanol?

PART – IV

54. a) Write any five achievements of Chandrayan-1?
b) Write the difference between Mass and weight.
55. a) Light travels at 1.90×10^8 m/s in a crystal, what is the Crystal's index of refraction?
b) Find the nature, position and magnification of the image formed by a convex lens of focal length 10cm, if the object is placed at a distance of 15cm.

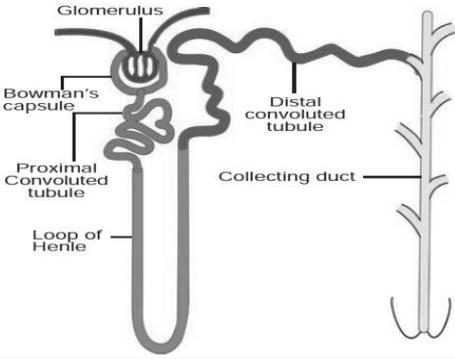


SSLC PRE - PUBLIC EXAMINATION – 2015 -16

**SCIENCE
KEY ANSWERS**

MARKS : 75
TIME : 2.30 Hrs

Q.No.	Answer	Mark	
SECTION – I (15 X 1 = 15)			
1.	i) yy	1	
2.	iii. Entamoeba histolytica	1	
3.	ii) Leptotene -> zygotene -> Pachytene -> Diplotene -> Diakinesis	1	
4.	iv) Tridax	1	
5.	Bat : <u>Petagium (Wing)</u>	1	
6.	iv) Hydrotropism	1	
7.	i) Both 'A' and 'R' are true and 'R' explains 'A'.	1	
8.	ii) Methane	1	
9.	i) Tyndall effect	1	
10.	i) equal to 7	1	
11.	i) Galvanization	1	
12.	iv) Ethene	1	
13.	ii) nitrogen	1	
14.	i) greater than 82	1	
15.	i) Concave mirror	1	
SECTION – II (20 X 2 = 40)			
16.	i)Intergeneric variation.	1	
	ii)Intraspecific variation.	1	
17.	The different species of mankind in chronological order from primitive to modern man.		
	3-4 million years ago - Homo habilis (Hominids).	½	
	1.5 million years ago - Homo erectus.	½	
	1 million years ago - The Neanderthal man	½	
	Between 75,000 and 10,000 years - The modern Homo sapiens	½	
18.	<u>Genetic Engineering.</u> Genetic engineering is the modification of the genetic information of living organisms by manipulation of DNA by adding, removing or repairing part of the DNA and changing the phenotype of the organism.	2	
19.	i) BCG	½	
	ii) Cholera	½	
	iii) Tuberculosis	½	
	iv) Sporozoites	½	
20.	List I	List II	
	A. Vasopressin	I. Diabetes insipidus	½
	B. Insulin	II. Diabetes mellitus	½
	C. Oxytocin	III. Contraction and relaxation of uterus	½
	D. Thymosin	Iv. Resist infection	½

21.	No.	Dry Dehiscent Fruits	Dry Indehiscent Fruits	1
	1.	Dehiscent fruits split open at maturity to disperse the seeds.	Indehiscent fruits do not split open at maturity and the seeds are liberated by the decaying of pericarp.	
21.	2.	Legume – Peas Follicle – Calotropis Capsule (a) Loculicidal capsule – Cotton (b) Septicidal capsule -Lady’s finger	Achene - Clematis, Mirabilis Caryopsis – Paddy Cypsela – Tridax Nut - Cashew nut	1
	22.	1. A. Venacava B. Pulmonary veins C. Pulmonary artery D. Aorta		1
22.	2. b) P & Q = Deoxygenated and R & S = oxygenated			1
23.	Nephron			Diagram 1 Mark Parts 1 Mark
24.	i. Sweat gland			½
	ii. Warm blooded			½
	iii. Capsule			½
	iv. Pericardium			½
25.	Differences between aerobic respiration and anaerobic respiration.			Any 3 points Each points carry ½ mark
	No.	Aerobic Respiration	Anaerobic Respiration	
	1.	It takes place in higher plants and animals.	It takes place in lower plants.(Yeast and Bacteria).	
	2.	Oxygen is utilized for respiration.	Oxygen is not utilized for respiration.	
	3.	Glucose is completely oxidized.	Incomplete oxidation of Glucose takes place.	
	4.	More energy is produced. (38 ATP)	Less energy is produced. (2 ATP)	
5.	The end products are CO₂, H₂O and Energy	The end products are Ethenol or Lactic acid , CO₂ and Energy		
Glycolysis is the common event for both Aerobic and Anaerobic Respiration.				½ Mark
26.	Photosynthesis: The conversion of carbon-dioxide and water into carbohydrates in the presence of light and chlorophyll is known as photosynthesis.			1
	Balanced equation for Photosynthesis is $6\text{CO}_2 + 12\text{H}_2\text{O} \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 + 6\text{H}_2\text{O}$ (Glucose)			1

27.	Autotrophs	Chlorophyll	1 Mark	Hibiscus	1 Mark	2
	Parasites	Haustoria		Cuscutta		
	Saprophytes	Mycorrhiza		Monotropa		
28.	i. d) 'I' is a climax carnivore					1
	ii. Total number of food chains are present in the above food web is 10					1
29.	. i. Dengue Fever and Chickungunya affect the majority of the population.					½
	ii. The mode of transmission of these diseases.					½
	<i>Disease</i>		<i>Mode of transmission</i>			
	<i>Dengue</i>		<i>Bite of mosquito</i>			
	<i>Chickungunya</i>		<i>Bite of mosquito</i>			
29.	iii. Measures that can control the other two diseases are					½
	A. Cholera i) Proper sanitation. ii) Using boiled water. iii) Keeping food covered.					
29.	B. Rat flea					½
	i) Proper garbage disposal. ii) Keeping the house and surroundings clean. iii) Avoid contact with rats or rat-contaminated dwellings.					
30.	. Suitable appliances to conserve the electric energy. a) Florescent bulbs b) Solar water heater and c) Electronic choke.					2
31.	Water borne diseases	Water related diseases	Water based diseases		2	
	Typhoid	Dengue	Scabies			
	Cholera	Malaria	Lice			
	Amoebiasis	Filariasis	Trachoma			
32.	Weight of common salt = 20gm					(1mark)
	Weight of water = 50gm					
32.	Weight percentage = $\frac{\text{weight of solute}}{\text{wt of solute} + \text{wt of solvent}} \times 100$					(1mark)
	= $\frac{20}{20+50} \times 100$					
	= 28.57%					
33.	a) carbon dioxide gas -----					(1mark)
	b) increase in pressure, will increase the solubility of gas -----					(1mark)
34.	a) gram molecular mass of H ₂ SO ₄ = 2(H) + 1(S) + 4(O) = (2x1) + (1x32) + (4x16)					

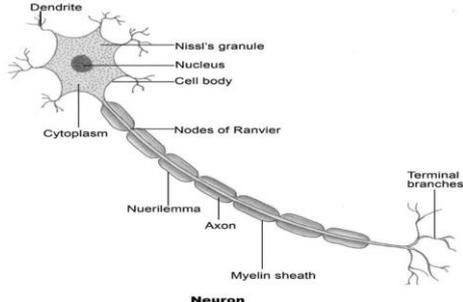
	$= 2+32+64$ $= 98g \quad \text{-----}$	(1 mark)																								
	b) gram molecular mass of $\text{CO}_2 = 1(\text{C}) + 2(\text{O}) = (1 \times 12) + (2 \times 16)$ $= 12+32$ $= 44g \quad \text{-----}$	(1 mark)																								
35.	a) weak acid – Acid ‘A’; Strong acid – Acid – ‘B’ ----- (½m) b) Acid which dissociates partially is called weak acid ----- (½m) c) Acid which dissociates completely in water is called strong acid. (½m) d) Weak acid – CH_3COOH ; Strong acid – HCl ----- (½m)	2																								
36.	a) The above reaction is a neutralisation reaction. (½m) b) The chemical reaction which proceed with the evolution of heat energy is called exothermic reaction (½m) c) ----- (½m) <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Exothermic reaction</th> <th>Exothermic reaction</th> </tr> </thead> <tbody> <tr> <td>Heat energy is liberated as the reaction proceeds. eg. $\text{N}_2+3\text{H}_2 \rightarrow 2\text{NH}_3+\text{heat}$</td> <td>Heat energy is absorbed as the reaction proceeds. $2\text{NH}_3+\text{heat} \rightarrow \text{N}_2+3\text{H}_2$</td> </tr> </tbody> </table> d) The temperature of the solution is increased when the chemicals react because it is an exothermic reaction. ----- (½m)	Exothermic reaction	Exothermic reaction	Heat energy is liberated as the reaction proceeds. eg. $\text{N}_2+3\text{H}_2 \rightarrow 2\text{NH}_3+\text{heat}$	Heat energy is absorbed as the reaction proceeds. $2\text{NH}_3+\text{heat} \rightarrow \text{N}_2+3\text{H}_2$	2																				
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37.	a) 91.6% (½m) b) ore formers (½m) c) Mg (½m) d) rust ($\text{Fe}_2\text{O}_3 \cdot \text{XH}_2\text{O}$) is formed (½m)	2																								
38.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>metal</th> <th>Step1</th> <th>Step2</th> <th>Step3</th> <th>Step4</th> <th>Step5</th> </tr> </thead> <tbody> <tr> <td>Al</td> <td>Baeyer's Process</td> <td>Hall's Process</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>Cu</td> <td>Froth floatation</td> <td>Roasting</td> <td>Smelting</td> <td>Bessemerisation</td> <td>Electrolytic refining</td> </tr> <tr> <td>Fe</td> <td>Gravity separation</td> <td>Roasting, calcination</td> <td>Smelting</td> <td>Blast Furnace</td> <td>-</td> </tr> </tbody> </table>	metal	Step1	Step2	Step3	Step4	Step5	Al	Baeyer's Process	Hall's Process	-	-	-	Cu	Froth floatation	Roasting	Smelting	Bessemerisation	Electrolytic refining	Fe	Gravity separation	Roasting, calcination	Smelting	Blast Furnace	-	(½+ 1 + ½)
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39.	Compound (A) – Acetic acid used as preservatives in pickles. Ethanol + Acetic acid \rightarrow B [ethyl ethanoate]	2																								

46.	a) Iris b) Retina	----- (1+1)	2
47.	(i) Hypermetropia and presbyopia are the other two types of defect -- (1) (ii) Hypermetropia is corrected by using convex lens. Presbyopia is corrected by bi-focal lens.	----- (1)	2

SECTION – III (4 X 5 = 20)

PART - I

48.	i..The immunization schedule for the baby, in the first six months .		3																								
	<table border="1"> <thead> <tr> <th>S.No.</th> <th>Age</th> <th>Vaccine</th> <th>Dosage</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>New born</td> <td>BCG</td> <td>1st dose</td> </tr> <tr> <td>2.</td> <td>15 days</td> <td>Oral polio</td> <td>1st dose</td> </tr> <tr> <td>3.</td> <td>6th week</td> <td>DPT & Polio</td> <td>1st dose</td> </tr> <tr> <td>4.</td> <td>10th week</td> <td>DPT & Polio</td> <td>2nd dose</td> </tr> <tr> <td>5.</td> <td>14th week</td> <td>DPT & Polio</td> <td>3rd dose</td> </tr> </tbody> </table>	S.No.	Age	Vaccine	Dosage	1.	New born	BCG	1 st dose	2.	15 days	Oral polio	1 st dose	3.	6 th week	DPT & Polio	1 st dose	4.	10 th week	DPT & Polio	2 nd dose	5.	14 th week	DPT & Polio	3 rd dose		
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5.	14 th week	DPT & Polio	3 rd dose																								
	ii.The diseases that can be cured as per the schedule. BCG –Tuberculosis Oral polio - Polio DPT - Diphtheria, Pertusis & Tetanus (Triple Antigen)		2																								

49.	<p><u>The structure of a neuron :</u></p>  <p>Nerve cells or neurons are the structural and functional units of the nervous system. The Human Brain is made up of about 86 billion neurons and many more neuroglial cells (more than 86 billion). A nerve cell is a microscopic structure consisting of three major parts namely, cell body, dendrites and axon.</p> <p><u>I.Cell body</u> The cell structure is irregular in shape or polyhedral. It is also called cyton. Cell body contains cytoplasm with typical cell organelles and certain granular bodies called Nissle's granules. Nissle's granules are a group of ribosomes for protein synthesis.</p> <p><u>II.Dendrites</u> Dendrites or Dendrons are short fibres which branch repeatedly and protrude out of the cell body. Dendrites transmit electrical impulses towards the cyton.</p> <p><u>III.Axon</u> One of the fibres arising from the cell body is very long with a branched distal end and it is called Axon. The distal branch of the axon terminates in bulb-like structures called synaptic knob filled with chemicals called neuro transmitters. The cytoplasm of the axon is known as axoplasm. The axon which is covered by a myelin sheath is formed of many layers of Schwann cells. The outermost layer of Schwann cells is called Neurilemma. The gaps left by the myelin sheath are called Nodes of Ranvier. Neurilemma is discontinuous at Nodes of Ranvier. The myelin sheath ensures rapid transmission of electric impulses.</p>		1 1 1 1
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	<p>Desalination of ocean water is a technology that has a great potential for increasing the supply of fresh water. Desalination is more expensive than most other methods of obtaining fresh water. In desalination, the common methods of evaporation and re-condensation are involved.</p> <p>iii) Dams, Reservoirs and Canals Dams and storage reservoirs trap run-off water in them and transfer the water from areas of excess to areas of deficit using canals and underground pipes.</p> <p>iv) Water Shed Management The management of rain water and the resultant run-off is called water shed management. Water shed is an area characterized by construction of small dams to hold back water which will provide useful wildlife habitat and stock watering facilities.</p> <p>v) Rain Water Harvesting Rain water harvesting essentially means collecting rain water from the roof of buildings or courtyards and storing it underground for later use. The main idea in harvesting rain water is to check the run-off water. The rain water that falls on the roofs of buildings or in courtyards is collected through pipes and stored in under ground tanks of the buildings fitted with motor for drawing the water for use. The process of rain water harvesting is not only simple but also economically beneficial. It helps in meeting the increased demand for water, particularly in urban areas and prevent flooding of living areas.</p> <p>vi) Wetland Conservation It preserves natural water storage and acts as aquifer recharge zones.</p> <p>vii) Domestic Conservation As an individual, everyone can reduce the water loss by using a bucket of water than by taking a shower, using low-flow taps, using recycled water for lawns, home gardens, vehicle washing and using water conserving appliances.</p> <p>viii) Industrial Conservation Cooling water can be recharged and waste water can be treated and reused.</p>	<p>Any 5 points. Each point carries 1 mark.</p>
Part III		
52.	<p>a) mass of oxygen = 174-100 = 74g ----- (1)</p> <p>b) no of moles of oxygen = $\frac{\text{mass of oxygen}}{\text{Atomic mass}}$ = $\frac{74}{16}$ = 4.62 moles ----- (1)</p> <p>c) no of moles of Ca = $\frac{100}{40}$ = 2.5 moles ----- (1)</p> <p>d) mass of Ca from 1000g of CaO 100g of Ca was obtained from 174g of CaO \therefore 1000g of Ca would give = $\frac{100 \times 1000}{174}$ = 574.71g of Ca ----- (2)</p>	5
53.	<p>(i) $\text{CH}_3\text{COOH} + \text{NaHCO}_3 \rightarrow \text{CH}_3\text{COONa} + \text{CO}_2\uparrow + \text{H}_2\text{O}$ ----- (1) (A) (Sodium acetate)</p> <p>ii) $\text{CH}_3\text{COONa} \xrightarrow{\text{NaOH/ CaO}} \text{CH}_4\uparrow + \text{Na}_2\text{CO}_3$ ----- (1)</p> <p>iii) $\text{CH}_3\text{CH}_2\text{OH} \xrightarrow{\text{KMnO}_4 / \text{OH}^-} \text{CH}_3\text{COOH} + \text{H}_2\text{O}$ ----- (1)</p>	5

Ethyl alcohol	Acetic acid	
Result : ----- (2 marks)		
Compound	Structure	Name
A	CH ₃ COOH	Acetic acid
B	CH ₄	Methane

Part IV

54.	<p>a) Achievements of chandrayaan-I. (any five)</p> <ul style="list-style-type: none"> ➤ The discovery of wide-spread presence of water molecules in lunar soil. ➤ Chandrayaan's moon mineralogy Mapper has confirmed that moon was once completely molten. ➤ European space agency payload chandrayaan-I imaging X-ray spectrometer (C1xs) detected more than two dozen weak solar flares during the mission. ➤ The terrain mapping camera on board chandrayaan-I has recorded images of the landing site of the US space-craft Apollo-15, Apollo-11. ➤ It has provided high-resolution spectral data on the mineralogy of the moon. ➤ Lunar Laser Ranging Instrument (LLRI) covered both the lunar poles and additional lunar region of interest ➤ The X-ray signatures of aluminum, magnesium and silicon were picked up by the C1xS X-ray camera. ➤ The Bulgarian payload called Radiation Dose Monitor(RADOM) was activated on the very same day of its launch and worked till the mission ended. ➤ More than 40,000 images have been transmitted by chandrayaan camera in 75days. ➤ The terrain Mapping camera acquired images of peaks and craters. The moon consists mostly of craters. ➤ Chandrayaan beamed back its first images of the earth in its entirety ➤ Chandrayaan-I has discovered large caves on the lunar surface that can act as human shelter on the moon. <p>b)</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 50%; text-align: center;">Mass</th> <th style="width: 50%; text-align: center;">Weight</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Fundamental quantity • It is the amount of matter contained in a body • Its unit is kilogram • Remains the same • It is measured using physical balance </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Derived quantity • It is the gravitational pull acting on the body • Its unit is Newton • Varies from place to place • It is measured using spring balance. </td> </tr> </tbody> </table>	Mass	Weight	<ul style="list-style-type: none"> • Fundamental quantity • It is the amount of matter contained in a body • Its unit is kilogram • Remains the same • It is measured using physical balance 	<ul style="list-style-type: none"> • Derived quantity • It is the gravitational pull acting on the body • Its unit is Newton • Varies from place to place • It is measured using spring balance. 	3
Mass	Weight					
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55.	<p>a) $\therefore \mu = \frac{\text{Speed of light in air}}{\text{speed of light in Crystal}} \quad \text{-----} \quad (1)$</p>	2
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$$\mu = \frac{C_a}{C_m} = \frac{3 \times 10^8}{1.9 \times 10^8} = 1.578 \text{ ----- (1)}$$

b)

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$= \frac{1}{10} + \frac{1}{-15}$$

$$= \frac{1}{10} - \frac{1}{15}$$

$$\frac{1}{v} = \frac{5}{150}$$

$$v = \frac{150}{5} = 30cm \text{ ----- (1)}$$

Nature = real and inverted ----- (1/2)

Position = on beyond $2F_2$ ----- (1/2)

Diagram ----- (1)