S.S.L.C GOVT. EXAMINATION – JUNE 2012

SCIENCE
(NEW SYLLABUS)

Time Allowed : 2½ Hours]   **[Maximum Marks : 75**

Instruction   :   Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.

Note   :   This question paper contains three Sections.

SECTION - I
(Marks: 15)

Note: (i)   Answer *all* the 15 questions.

      (ii)   Choose the correct answer from the four alternatives given in the brackets.

$15 \times 1 = 15$

1. _____ is alternate expression of same gene.
   (Alleles, Variation, Speciation, Gene, Allelomorph)

2. An example for protozoan infecting our intestine is _____
   (*Plasmodium vivax, Entamoeba histolytica, Trypanosoma gamblense, Taenia solium*)

3. The fertilized ovary is a fruit. The fruit develops from a single flower with multicarpellary, Opocarpous superior ovary is _____.
   (aggregate fruit, composite fruit, simple fruit, multiple fruit)

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

5. What is called as 'black gold'?
   (Hydrocarbons, Coal, Petroleum, Ether)

6. The mixture of gases used by deep sea divers is _____.
   (Helium-Oxygen, Oxygen-Nitrogen, Helium-Neon, Neon-Oxygen)

7. For human blood the pH range is _____ to _____.
   (4.5-6, 6.5-7.5, 7.35-7.45, 4.4-5.5)

8. First period contains only two elements, one is hydrogen and the other is ____
   (Nitrogen, Oxygen, Helium, Neon)

9. Bauxite is the ore of _____.
   (Aluminium, Sodium, Copper, Iron)

10. IUPAC name of the first member of alkyne is _____.
    (ethene, ethyne, ethane, acetylene)

11. The freezing of biotechnology products like vaccines requires _____ freezing sys ıs.
    (helium, nitrogen, ammonia, chlorine)

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

13. The main source of bio-mass energy is _____.
    (coal, heat energy, thermal energy, cow-dung)

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

15. The defect myopia can be corrected by using a _____
(convex lens, concave lens, concave mirror, convex mirror)

SECTION - II
(Marks: 40)

Note: Answer any twenty questions   20 × 2 = 40

16. Name the variation in the following cases:
The eye colour among the human beings are varied as blue, black, brown, green etc.
(a) This is called as _____ variation.
The dentition is rabbit and elephant are not the same.
(b) This is called as _____ variation.

17. Ramya is suffering from bleeding gum and loosening teeth. On a diagnosis it was found
to have been caused by vitamin deficiency.
Suggest Ramya the kind of vitamin that is lacking in her food and tell your friend tl
name of deficiency disease that she suffers from.
(a) Vitamins
(b) Deficiency diseases and
(c) Symptoms, Match them properly.

| A Vitamins	B Deficiency diseases	C Symptoms
Vitamin A	Rickets	Defective calcification of bones
Vitamin B_1	Scurvy	Nervous disorder
Vitamin C	Beri-beri	Bleeding gum
Vitamin D	Nyctalopia	Night blindness

18. Copy the diagram and label any *two* parts in the group given:
(cyton, axon, dendron, end plate)

19. Correct the statements if they are wrong:
(a) Alpha cells produce insulin and beta cells produce glucagon.
(b) Ovary produces eggs and androgen.

20. Copy the diagram and mark (A) and (B) in the parts of the brain corresponding with
the functions: (A) Seat of smell (B) Seat of vision

21. In balsam plant the seeds fall off far away from the mother plant.
    (a) Is the statement correct or incorrect?
    (b) Give reason.

22. Copy the diagram and label any *four* parts with heading.
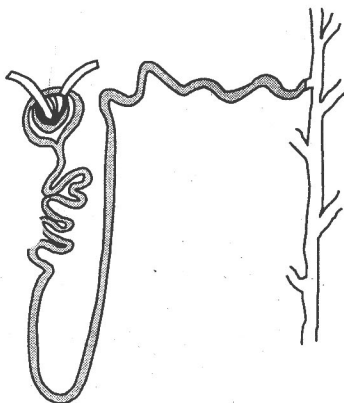
23. Fill the tabular column:

Excretory organ	Excretory products	Send out as
Lungs	Carbon dioxide and water vapour	–
Skin	–	Sweat

24. What are the four compositions of circulatory system of man?

25. Match the methods of nutrition of special organs with suitable examples:

Autotrophs	Mycorrhiza	Cuscutta
Parasites	Chlorophyll	Monotropa
Saprophytes	Haustoria	Hibiscus

26. Name the plants which are used in the production of bio-plastic.

27. Write any *four* liquid biofuels used for transportation.

28. Match the suitable renewable and non-renewable sources:

| Sources	A	B	C
Renewable	Coal	Wind	Petroleum
Non-renewable	Hydrogen	Natural gas	Solar energy

29. Pick out the suitable appliances to conserve the electric energy:
    Fluorescent bulb, copper coke, solar water heater, electric water heater, tungsten bulb, electronic choke.

30. Take 10 g of common salt and dissolve it in 40 g of water. Find the concentration of solution in terms of weight percent.

31. Distinguish between the saturated and unsaturated solutions using the data given below at a temperature of 25°C
    (a) 16 g NaCl in 100 g of water
    (b) 36 g NaCl in 100 g of water

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

33. What type of chemical reaction takes place when
    (i) limestone is heated?
    (ii) a magnesium ribbon is burnt in air?

34. On strong heating, crystals of lead nitrate produce _____ gas and the colour of the gas is _____.

35. Consider the following statements:

    Assertion (A):   Greenish layer appears on copper vessels if left uncleaned
    Reason (R):   It is due to the formation of layer of basic copper carbonate

    Choose the correct option:
    (A) Assertion (A) and Reason (R) are correct and relevant to each other
    (B) Assertion (A) is true, but Reason (R) is not relevant to the Assertion (A).

36. Can rusting of iron nail occurs in distilled water? Justity your answer.

37. Write the common names and IUPAC names of the following:
    (a) CH_3COCH_3
    (b) CH_3COOH

38. Fill in the blanks:
    (a) Force = Mass × Acceleration, then momentum = _____
    (b) Liquid hydrogen is for rocket, then _____ for MRI.

39. Correct the mistakes, if any in the following statements:
    (a) One newton is the force that produces an acceleration of 1 ms^{-2} in an object of a gram mass
    (b) Action and reaction if always acting on the same body

40. Match the components with symbols:

Sl.No.	Components	Symbols
1.	A wire joint	——+|⊢——
2.	Plug key or switch (open)	——⌇⌇⌇——
3.	resistor	——( )——
4.	An electric cell	——|——

41. Radium and polonium were discovered by _____ and _____.
    (Marie Curie, Pierre Curie, Watson, Otto Hahn).

42. Correct the mistakes, if any in the following statements:
    (a) A good source of energy would be one which would do a small amount of work per unit volume of mass.
    (b) Any source of energy we use to do work is consumed and can be used again.

43.
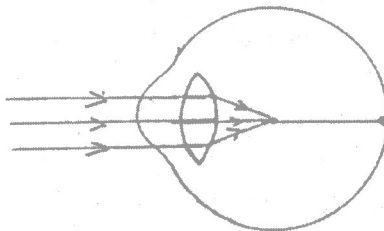
    (a) _____ defect of eye.

    (b) _____ lens is used to correct the defect.

44. A convex mirror used for rear-view on an automobile has a radius of curvature of 3 m. If a bus is located at 5 m from this mirror, find the position and nature of the image.

45. Find out the odd one:

    (a) Angle of incidence, angle of refraction, angle of emergence, right angle.

    (b) Convex mirror, concave lens, plane mirror, convex lens.

SECTION - III
(Marks : 20)

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

     (ii) Each question carries *five* marks.

     (iii) Draw diagram wherever necessary. $4 \times 5 = 20$

PART - I

46. (a) What is bio-sensor?

    (b) State any four applications of bio-sensor in medicines.

47. Kala has delivered a baby.

    (a) Suggest the immunization schedule for the body in the first six months.

    (b) What are all the diseases that can be cured as per the schedule?

PART - II

48. (a) Describe the structure of dicot seed.

    (b) Draw diagram of dicot seed and label the parts.

49. (a) What is global village?

    (b) What is the use of global village?

    (c) What are the technologies used in global village?

PART - III

50. (a) If 90 kg of water is taken in a beaker, find the number of moles in it.

    (b) Atoms and molecules are the building blocks of matter. List out any three differences between them.

51. (a) Ethanoic acid reacts with carbonates and bicarbonates.

    (b) Write the balanced equation.

    (c) Give three uses of ethanoic acid.

PART - IV

52. (a) Newton's third law of motion:

For every action there is an equal and opposite reaction. Explain this law using one illustration.

(b) $F = Gm_1 m_2/d^2$ is the mathematical form of Newton's law of gravitation. Give the statement of Newton's law of gravitation.

53. (a) Label the following, in the following diagram:
    (i) Incident ray
    (ii) Refracted ray
    (iii) Emergent ray
    (iv) Angle of deviation
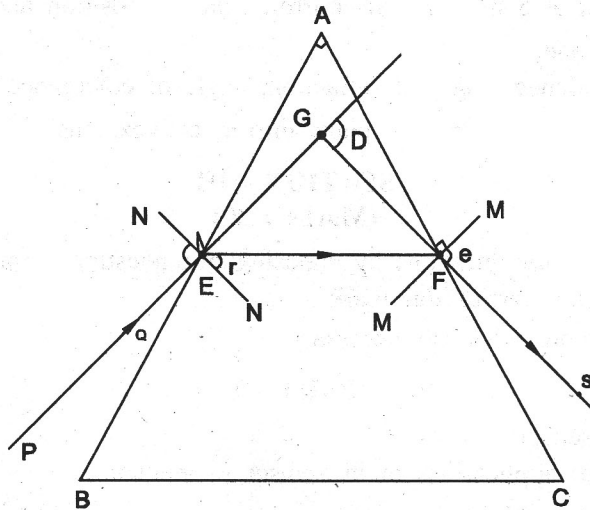
(b) The refractive index of diamond is 2.42. What is the meaning of this statement in relation to speed of light?

S.S.L.C. PUBLIC EXAM JUNE - 2012

SCIENCE

ANSWERS

SECTION - I   15 × 1 = 15

1. Alleles
2. Entamoeba histolytica
3. Aggregate fruit
4. Transport of water
5. Petroleum
6. Helium-oxygen
7. 7.35 - 7.45
8. Helium
9. Aluminium
10. Ethyne
11. Nitrogen
12. Electric energy
13. Cow-durg
14. Magnetic field
15. Concave lens

SECTION - II   20 × 2 = 40

16. a) Intraspecific variation   b) Interspecific variation

17.

Vitamins	Deficiency diseases	Symptoms
Vitamin A	Nyctalopia	Night blindness
Vitamin B_1	Beri-beri	Nervous disorder
Vitamin C	Scurvy	Bleeding gum
Vitamin D	Rickets	Defective calcification of bones

18.

19. a) Alpha cells produce glucagon and beta cells produce insulin.

    b) Ovary produces eggs and oestrogen.

20.

21. a) The statement is correct.

    b) In balsam, the seeds are dispersed by a mechanism called autochory. In this, fruit bursts with a sudden jerk and disperse the seeds by an explosive mechanism.

22.

23.

Excretory organ	Excretory products	Sent out as
Lungs	Carbondioxide and water vapour	Expired air
Skin	Excess water and salt	Sweat

24. Four compositions of circulatory system of man are

   i)   the heart

   ii)   the blood vessels namely arteries, veins and capillaries

   iii) the blood

   iv)   the lymph

25.

Autotrophs	Chlorophyll	Hibiscus
Parasites	Haustoria	Cuscutta
Saprophytes	Mycorrhiza	Monotropa

26. Corn, potatoes or other agricultural products are the plants used in the production of bio-plastics.

27. Liquid bio fuels used for transportation are

   i)   Bioalcohol   iv) Vegetable oil

   ii)   Green diesel   v) Bioethers

   iii) Biodiesel   vi) Biogas

28.

Sources	A	B	C
Renewable	Hydrogen	Wind	Solar energy
Non-renewable	Coal	Natural gas	Petroleum

29. Florescent bulbs, solar water heater, electronic choke.

30. Weight percent $= \dfrac{\text{Weight of the solute}}{\text{Weight of solute} + \text{Weight of solvent}} \times 100$

$= \dfrac{10}{10+40} \times 100 = \dfrac{10 \times 100}{50} = 20\%$

31. (i)   It is given that the solubility of NaCl is 36 g. It implies that 36 g of NaCl dissolves completely in 100 g water at given temperature to form saturated solution.

(ii) In case A, only 16 g NaCl is dissolved in 100 g water at 25°C and can dissolve 20 g more at the same temperature to form saturated solution. Hence, it is an **unsaturated solution**.

(iii) Whereas in the second case B, 36 g of NaCl is present in 100 g of water and further no more solute can be dissolved at that temperature. Hence, it is a **saturated solution**.

32. Isotopes - $_{17}Cl^{35}$, $_{17}Cl^{37}$

Isobars - $_{18}Ar^{40}$, $_{20}Ca^{40}$

33. i) Decomposition reaction   ii) Combination reaction

34. On strong healing, crystals of lead nitrate produce <u>nitrogen dioxide</u> gas and the colour of the gas <u>reddish brown</u>.

35. (A) Assertion (A) and Reason (R) are correct and relevant to each other.

36. i)   Rusting of iron can occur in distilled water.

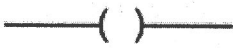ii) Rusting takes place due to the presence of air and water.

37.
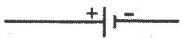
	Common name	IUPAC name
CH_3COCH_3	Acetone	Propanone
CH_3COOH	Acetic acid	Ethanoic acid

38. a)   Momentum = Mass × Velocity

b)   Liquid helium

39. a)   One newton is the force that produces an acceleration of 1 ms^{-2} in an object of <u>1 kilogram</u> mass.

b)   Action and reaction is always acting on the <u>different</u> bodies.

40.

Components		Symbols
i)	A wire joint	
ii)	Plug key (or) Switch (open)	
iii)	A resistor	
iv)	An electric cell	

41. Radium and polonium were discovered by <u>Marie curie</u> and <u>Pierre curie</u>.

42. a)   A good source of energy would be one which do a <u>more</u> amount of work per unit volume of mass.

b)   Any source of energy we use to do work is consumed and <u>cannot</u> be used again.

43. a) <u>Myopia (or) Nearsightedness</u> defect of eye.

    b) <u>Concave lens</u> is used to correct the defect.

44. Radius of curvature, $R = + 3.00$ m   [R is +ve for a convex mirror)

    Object distance, $u = -5.00$ m   height of the image, $h' = ?$

    $$\text{Focal length,} \quad f = \frac{R}{2} = +\frac{3.00\,m}{2} = +1.50\,m$$

    $$\text{As} \quad \frac{1}{u} + \frac{1}{v} = \frac{1}{f}$$

    $$\therefore \quad \frac{1}{v} = \frac{1}{f} - \frac{1}{u} = +\frac{1}{1.5} - \frac{1}{-5} = \frac{1}{1.5} + \frac{1}{5} = \frac{5 + 1.5}{7.5}$$

    $$\frac{1}{v} = \frac{6.5}{7.5}; \quad \therefore v = \frac{+7.5}{6.5} = +1.15\,m$$

    The image is 1.15 m at the back of the mirror. The image is virtual.

45. a) Right angle   b) Plane mirror

SECTION - III $4 \times 5 = 20$
Part - I

46. a) Bio sensor is a device consisting of immobilized layer of biological material such as enzyme, antibody, hormone, nucleic acids, organelles or whole cells and its contact with a sensor. The sensor converts biological signals into an electrical signal.

    b) **Applications of biosensor:**
    - Blood glucose level can be detected.
    - Production of any toxin in the body due to infection can be detected.
    - Pollution in drinking water can be monitored.
    - Odour, freshness and taste of food can be measured.

47. (a)

New Born	–	BCG	–	1st dosage
15 days	–	Oral polio	–	1st dosage
6th week	–	DPT & Polio	–	1st dosage
10th week	–	DPT & Polio	–	2nd dosage
14th week	–	DPT & Polio	–	3rd dosage

   (b) Tuberculosis, Polio, Diptheria, Pertussis, Tetanus are the diseases that can be prevented as per the schedule.

Part - II

48. i. The seed is *bulky, oval* and slightly *indented* on one side.

    ii. On this side there is a short longitudinal, whitish ridge called the *raphae*. At one end of the raphae there is a minute opening known as *germ pore* or *micropyle*. If a water

soaked seed is pressed gently a small drop of water along with air bubbles will be found coming out though the micropyle.

iii. The embryo is enclosed by the seed coat. It consists of cotyledons attached to the primary axis which has rudimentary root portion called the *radicle* and a rudimentary stem portion known as *plumule*.

iv. The tip of the radicle projects outside ,and is nearer to the micropyle. The plumule is placed between the two cotyledons and consists of ⌐ ̣nort axis, and a small bud having two tiny little folded leaves.
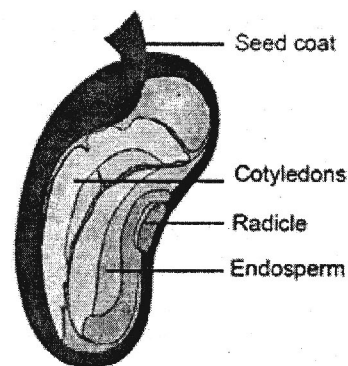
49. a) Global village is the term that means world had shrunk into a village by means of different types of media.

b) **Uses of global village :**

i) It is easy to pass across news there by making the world become a single village.

ii) People can easily contact each other quicker through Information Communication Technologies (ICTs).

iii) It has implications for forming new sociological structures within the context of culture.

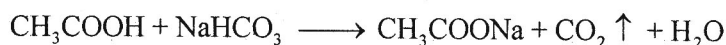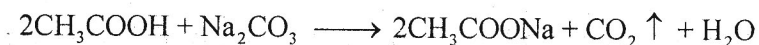c) Web connected computers, electronic instruments are the technologies used in global village.

Part - III

50. a) Gram molecular mass of water $H_2O = 2(H) + 1(O)$

$$= (2 \times 1)(1 \times 16) = 2 + 16 + 18 \text{ g}$$

No. of moles $= \dfrac{\text{Mass}}{\text{Molecular mass}} = \dfrac{90}{18} = 5$ moles

b)

Atom	Molecule
i) The smallest particle of an element that can take part in a chemical reaction.	The smallest particle of an element or a compound that can exist freely.
ii) An atom is a non bonded entity.	A molecule is a bonded entity.
iii) An atom may or may not exist freely.	A molecule can exist freely.

51. a) Ethanoic acid reacts with carbonates and bicarbonates and produces brisk effervescence due to evolution of CO_2.

$$2CH_3COOH + Na_2CO_3 \longrightarrow 2CH_3COONa + CO_2 \uparrow + H_2O$$

$$CH_3COOH + NaHCO_3 \longrightarrow CH_3COONa + CO_2 \uparrow + H_2O$$

b) Uses of ethanoic acid (any three)

  i)   for making vinegar which is used as a preservative in food and fruit juices.

  ii) used as a laboratory reagent.

  iii) used for coagulating rubber from latex.

  iv) used in the preparation of dyes, perfumes and medicine.

52. a) **Recoiling of a gun:** When a gun is fired, the bullet goes out due to the force applied on it through the trigger (this is action). According to Newton's third law of motion, the gun recoils backwards due to the reaction acting on it in the opposite direction. This gives a backward jerk to the shoulder of the gunman

    Swimming : When a person swims, he pushes the water in the backward direction with his hands (this is action). As the reaction, the water pushes the person in the forward direction with an equal force.

b) *Newton's law of gravitation :* Every body in this universe attracts every other body with a force, which is directly proportional to the product of the masses and inversely proportional to the square of the distance between their centres and acts along their line joining their centres.

53. a)
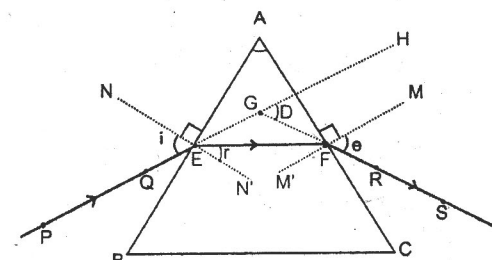
PE - Incident ray $\angle i$ - Angle of incident

EF - Refracted ray $\angle r$ - Angle of refraction

FS - Emergent ray $\angle e$ - Angle of emergence

$\angle A$ - Angle of the Prism $\angle D$ - Angle of deviation

b) Refractive index of diamond = 2.42

$$\text{Refractive index} = \frac{\text{Velocity of light in air}}{\text{Velocity of light in medium}}$$

$$2.42 = \frac{3 \times 10^8}{\text{Velocity of light in medium}}$$

$$\text{Velocity of light in medium} = \frac{3 \times 10^8}{2.42}$$

The velocity of light in diamond is $\frac{1}{2.42}$ times the velocity of light in air or vaccum.