I.Q Section - I

Straight Objective Type

This section contains 30 multiple choice questions numbered 1 to 30. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

1. Kumar walks 10 meters in front and 10 meters to the right. Then every time turning to his left he walks 5, 15 and 15 meters respectively. How far is he now from his starting point?
   (A) 15 m (B) 10 m (C) 12 m (D) 5 m

2. If south-east is called east, North west is called west, south-west is called south and so on what will north be called?
   (A) North-west (B) South (C) North-East (D) East

3. Raji is 5 ranks ahead of Raj in a class of 46 students. If Raj's rank is twelth from the last, what is Raji's rank from the start?
   (A) 29 (B) 31 (C) 28 (D) 30

4. How many 3's are there in the following sequence which are neither preceded by 6 nor immediately followed by 9 ?
   9 3 6 6 3 9 5 9 3 7 8 9 1 6 3 9 6 3 9
   (A) One (B) Two (C) Three (D)Four

5. In a certain code MISTAKEN is written as SRHLOFLB. How is GROUNDED written in that code?
   (A) CDCMTNQF (B) TNQFCDCM (C) EFEOTNQF (D) TNQFEFEO

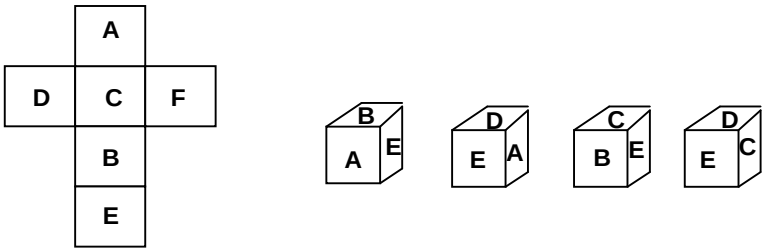
6. If air is called green, green is called blue, blue is called sky, sky is called yellow, yellow is called water, and water is called pink, then what is the colour of clear sky?
   (A) Blue (B) Sky (C) Yellow (D) Water

7. Pointing to a girl in the photograph, Nitin said, "Her mother's brother is the only son of my mother's father." How is the girl's mother related to Nitin?
   (A) Aunt (B) Mother (C) Sister (D) None of these

8. A is the son of B while B and C are sisters to one another. E is the mother of C. If D is the son of E, which of the following statement is correct.
   (A) E is the brother of B (B) D is the cousin of A
   (C) B and D are sisters (D) D is the maternal uncle of A

Space for rough work

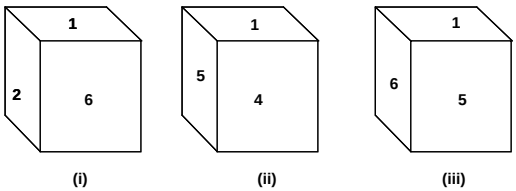
9. The figure given on the left hand side, in each problem, is folded to form a cube Choose from amongst the alternatives (a), (b), (c), (d, and the cubes that are similar to the cube formed.



(X) (a) (b) (c) (d)

(A) a (B) b (C) c (D) d

10. Which number is on the opposite surface of number 1?



(i) (ii) (iii)

(A) 5 (B) 3 (C) 4 (D) 2

DIRECTIONS (11 – 14)

A, B, C, D, E, F, G and H are sitting around a circle facing the centre. C is fourth to the left of F who is fifth to right of E. D is third to the right of A who is not immediate neighbour of E or F. B is third to left of H who is not immediate neighbour of E.

11. Four of the following five are alike in a certain way based on their positions in the above sitting arrangement and so form a group. Which is the one that does not belong to that group?
(A) HFE (B) DCG (C) BHF (D) AEF

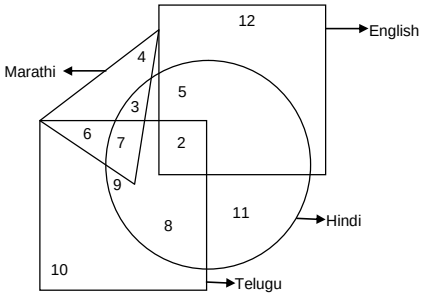
12. Which of the following pairs are sitting between A and D?
(A) FB (B) GB (C) FG (D) FE

13. What is D's position with respect to B?
I. Immediate right II. Fourth to the right
III. Third to the left IV. Immediate left
(A) Only I (B) Only II (C) Only II and III (D) Only IV

14. In which of the following pairs is the first person sitting to the immediate left of the second person?
(A) CH (B) GA (C) BD (D) FG

Space for rough work

Direction for (Q.15 to Q.17):

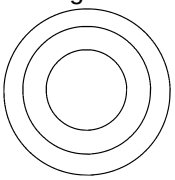
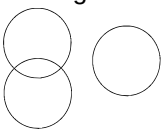
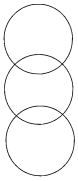
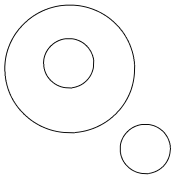


15. How many of them can speak English?
(A) 17 (B) 7 (C) 19 (D) None of these

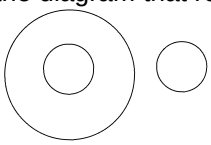
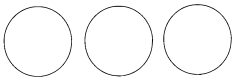
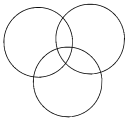
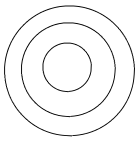
16. How many of the can speak Marathi and Hindi only?
(A) 3 (B) 7 (C) 10 (D) 13

17. How many of them can speak all the four languages?
(A) 2 (B) 7 (C) 9 (D) None

18. Select the diagram that represents the given relationship Musicians, Instrumentalists, Violinists

(A)  (B)  (C)  (D) 

19. Select the diagram that represents the given relationship Pigeons, Birds, dogs

(A)  (B)  (C)  (D) 

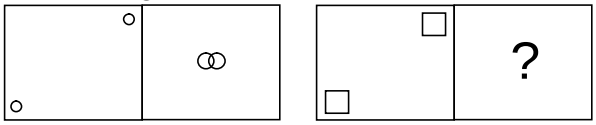
Space for rough work

20. Which of the following words will come second in the English dictionary?
(A) Magical (B) Magnify (C) Maternal (D) Magnetic

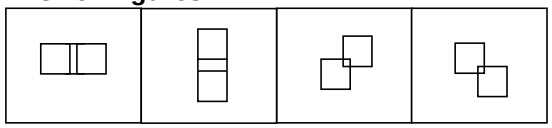
21. If the letters in each of the following four words are first rearranged in the alphabetical order and then group of letters so formed are rearranged as in a dictionary, which word would have its group of letters in the middle among the five?
Meet, Code, Lack, Deaf, Road
(A) Road (B) Deaf (C) Code (D) Lack

Directions (Q 22 - 23) :
Figures A and B in problem figures are related in a particular manner, Establish the same relationship between figures C and D in problem figures by choosing a figure from the four alternatives, which would replace the question mark (?)

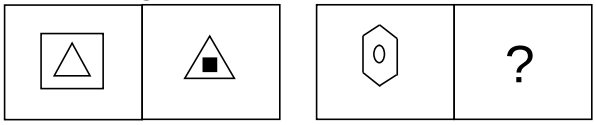
22. **Problem Figures**



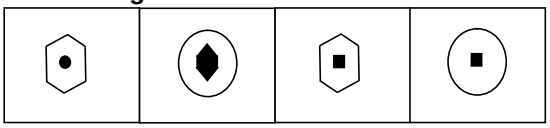
Answer Figures



23. **Problem Figures**



Answer Figures



Space for rough work

24. Today is Monday, after 61 days, the day will be:
(A) Wednesday (B) Saturday (C) Tuesday (D) Thursday

25. Which of the following is not a leap year?
(A) 700 (B) 800 (C) 1200 (D) 2000

26. How many times do the hands of a clock coincide in a day?
(A) 20 (B) 21 (C) 22 (D) 24

27. The angle between the minute hand and the hour hand of a clock when the time is 9:30 is?
(A) 105 degree (B) 150 degree (C) 100 degree (D) 90 degree

DIRECTIONS (28 – 30):
Seven doctors Prem, Abhay, Ram, Sunil, Tony, Vishal and Kumar working in different hospitals A, B, C, D, E, F and G not necessarily in the same order gathered for a public welfare meeting. Each one had a different specialization- Gynaecology, Cardiology, Neurology, Dermatology, Ophthalmology, Psychiatry and orthopedic.
i. Vishal is having specialization in Cardiology is from hospital G.
ii. The doctor from hospital D has specialization in Ophthalmology.
iii. Prem who is specialized in Gynaecology does not work in hospital A.
iv. Orthopedic is the specialization of Kumar who works in hospital E.
v. Ram is specialized in Dermatology and works in hospital B.
vi. Sunil is from hospital C and Abhay does not have specialization in Neurology or Psychiatry.

28. Doctor specialized in Gynaecology works in which hospital?
(A) E (B) D (C) A (D) F

29. Who is specialized in Ophthalmology?
(A) Abhay (B) Sunil (C) Tony (D) Ram

30. Which of the following combination of doctor-hospital-specialization is correct?
(A) Sunil-C-Neurology (B) Sunil-C-Psychiatry
(C) Abhay-D-Ophthalmology (D) Tony-A-Neurology

Space for rough work

Physics Section - II

Straight Objective Type

Physics contains 15 multiple choice questions numbered 1 to 15. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

1. A ball of mass 200 g is thrown vertically up at a speed of 20 m/s. Its momentum after 1s of throw is $\left(g = 10\ m/s^2\right)$
   (A) 2 kg m/s (B) 2000 kg m/s (C) 4 kg m/s (D) 4000 kg m/s

2. Rate of change of displacement is called
   (A) Speed (B) Deceleration (C) Acceleration (D) Velocity

3. A player moves along the boundary of a square ground of side 50 m in 200 sec. The magnitude of displacement of the player at the end of 11 minutes 40 seconds from his initial position is
   (A) 50 m (B) 150 m (C) 200 m (D) $50\sqrt{2}$ m

4. A bullet of mass 40gm is fired from a gun of mass 8kg with a velocity of 800 m/s, calculate the recoil velocity of gun
   (A) 1 m/s (B) -1 m/s (C) 2 m/s (D) -4 m/s

5. A hammer of mass 300 g, moving at 40m/s, strikes a nail. The nail stops the hammer in a very short time of 0.02 s. The force of the nail on the hammer is
   (A) 600N (B) 1200N (C) 2000N (D) 2500N

6. There will be a change in the speed or in the direction of motion of a body when it is acted upon by
   (A) Zero force (B) Balanced force
   (C) An Unbalanced force (D) None of these

7. The mass of the body on moon is 40kg, what is the weight on the earth.
   (A) 240kg (B) 392N (C) 240N (D) 400kg

Space for rough work

8. The gravitational force between two objects is F. If masses of both the objects are halved without altering the distance between them, then the gravitational force would become
(A) F/4 (B) F/2 (C) F (D) 2F

9. The distance between two bodies becomes 6 times more than the usual distance. Then F becomes
(A) 36 times (B) 6 times (C) 12 times (D) 1/36 times

10. The unit of pressure one bar is
(A) 1 Pascal (B) 1 kilo Pascal (C) 100 kPascal (D) 1000 kPascal

11. Relative density of mercury is
(A) 1 (B) 9.8 (C) 13.6 (D) 1000

12. A gardener pushes a lawn roller through a distance of 20m. If he applies a force of 20kg weight in a direction inclined at 60° to the ground, find the work done by him.($g=9.8m/s^2$)
(A) 400J (B) 1960J (C) 250J (D) 2514J

13. A person is holding a bucket by applying a force of 10N. He moves a horizontal distance of 5m and then climbs up a vertical distance of 10m. Find the total work done by him.
(A) 50J (B) 150J (C) 100J (D) 200J

14. A block of mass 2 kg is placed in an elevator going upward with an acceleration $2m/s^2$. The normal reaction by the elevator will be
(A) 20 N (B) 24 N (C) 4 N (D) 16 N

15. The altitude at which the weight of a body is only 64% of its weight on the surface of the earth is (Radius of the earth is 6400 km)
(A) 3200 km (B) 6400 km (C) 12800 km (D) 1600 km

Space for rough work

Chemistry

Straight Objective Type

Chemistry contains 15 multiple choice questions numbered 16 to 30. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

16. Charles law states
    (A) P is proportional to V (B) V is proportional to n
    (C) T is proportional to V (D) P is proportional to 1/V

17. Which among the following is a crystalline solid
    (A) Coal (B) Sulphur (C) NaCl (D) Galss

18. Which of the following is not a property of crystalline solid
    (A) Sharp melting point (B) Isotropic
    (C) Definite and regular geometry (D) High intermolecular forces

19. The electrical conductivity is maximum in
    (A) Solid (B) Liquid (C) Gas (D) Plasma

20. A solid has melting point of 122 F. Its value in °C is
    (A) 40°C (B) 50°C (C) 60°C (D) 70°C

21. If 12.5 gram of glucose is present in a solution, and if the concentration of a solution is found to be 5% by mass, then what will be the mass of the solution.
    (A) 500 g (B) 250 g (C) 300 g (D) 400 g

22. If 5 mL of acetone is present in 40 mL of solvent, then what will be the concentration of this solution
    (A) 900% (B) 11.1% (C) 2.2% (D) 4.4%

Space for rough work

23. Camphor can be purified by
(A) distillation (B) filtration (C) sedimentation (D) sublimation

24. Purity of a solid substance can be checked by its
(A) boiling point (B) melting point
(C) solubility in water (D) solubility in alcohol

25. A mixture of ethanol and water can be separated by
(A) filtration (B) decantation
(C) fractional distillation (D) sublimation

26. Which property of an element is always a whole number
(A) Atomic weight (B) mass number (C) Atomic number (D) both B and C

27. The number of electrons in a mole of hydrogen molecule is
(A) 6.02×10^{23} (B) 12.046×10^{23} (C) 3.0115×10^{23} (D) Indefinite

28. If molecular mass and atomic mass of sulphur are 256 and 32 respectively, its atomicity is
(A) 2 (B) 4 (C) 8 (D) 16

29. If x grams of A (atomic mass 50) contains n atoms, how many atoms are there in 20x g of element B (atomic weight 100)
(A) n (B) 10n (C) 20n (D) n/10

30. 20 mole of A and 14 moles of B are mixed and allowed to react according to the equation:
$A + 2B \rightarrow 3C$
What is the maximum number of moles of C which could be prepared?
(A) 14 (B) 21 (C) 13 (D) 7

Space for rough work

Mathematics

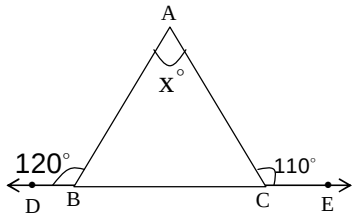
Straight Objective Type

Mathematics contains 15 multiple choice questions numbered 31 to 45. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

31. The simplified form of $\sqrt{125}+\sqrt{245}-\sqrt{845}$ is
    (A) $\sqrt{15}$ (B) $2\sqrt{5}$ (C) $-\sqrt{5}$ (D) $-2\sqrt{5}$

32. If $a^m \times a^n = a^{mn}$. Then $(m-1)(n-1) =$ _____.
    (A) 1 (B) 1 (C) 0 (D) 2

33. In the figure, x is equal to
    (A) 30° (B) 50°
    (C) 120° (D) 90°



34. If α,β are zeroes of $p(x) = x^2 - 6x + a$. Find the value a, if $3\alpha + 2\beta = 20$.
    (A) – 16 (B) 16 (C) 32 (D) – 24
    .

35. Rational number equivalent to $1.\overline{23}$ is
    (A) $\frac{123}{99}$ (B) $\frac{122}{99}$ (C) $\frac{61}{45}$ (D) $\frac{62}{45}$

Space for rough work

36. If angles of a triangle are in the ratio of 5:11:20, then difference of greatest angle and least angle of the triangle is
(A) 75° (B) 45° (C) 65° (D) 85°

37. The points (-2,-1),(1,0), (4,3) and (1,2) are the vertices of a
(A) Rectangle (B) parallelogram (C) square (D) Rhombus

38. If mid points of sides of a triangle are (0,3), (3,5) and (6,1) then coordinate of centroid of the triangle is
(A) (3,3) (B) (2,3) (C) (3,2) (D) none

39. If the three altitudes of triangle are equal, then triangle is
(A) Isosceles (B) Equilateral (C) Right angled (D) none

40. If $x = 9 + 4\sqrt{5}$, the value of $x - \frac{1}{x}$ is
(A) 18 (B) $\sqrt{5}$ (C) $8\sqrt{5}$ (D) 0

Space for rough work

41. Degree of constant polynomial is
(A) 0 (B) 1 (C) undefined (D) any number

42. Find the value of *K,* if –1 is a zero of the polynomial $4x^3 + 3x^2 - 4x + K$
(A) 0 (B) 1 (C) 3 (D) none of these

43. If $2^{2x-1} = \frac{1}{8^{x-3}}$, then the value of x is
(A) 3 (B) 2 (C) 0 (D) -2

44. In isosceles triangle ABC, AB = AC = 5cm and BC = 8cm, then its area is
(A) $20cm^2$ (B) $15cm^2$ (C) $12cm^2$ (D) $10cm^2$

45. If sides of a triangle are 13cm, 14cm and 15cm then its area is
(A) $84\sqrt{2}cm^2$ (B) $84cm^2$ (C) $28\sqrt{3}cm^2$ (d) $\sqrt{84}cm^2$

Space for rough work

Biology Section - III

Straight Objective Type

Biology contains 45 multiple choice questions numbered 1 to 45. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE** is correct.

1. What does G.M.O stand for?
   (A) Genetically modified Organism (B) Growth Maturity Order
   (C) Good Maturing Off sprin (D) Gold Medal Order

2. Pasturage is related to
   (A) Cattle (B) Fishery (C) Apiculture (D) Sericulture

3. Leghorn is related to
   (A) Apiculture (B) Dairy farming (C) Pisciculture (D) Poultry

4. Oysters, Crabs, mussels are examples of
   (A) Marine fishes (B) Fresh-water fishes (C) Finned fishes (D) Shell fish

5. Which of the following is an incorrect statements regarding improvement in crop production?
   (A) Tallness is desired in cereals
   (B) Profuse branching is good for fodder crops
   (C) Variety resistance to biotic stress is a good factor to improve crops
   (D) Shorter duration of crop from sowing to harvesting is better option

6. Red Sindhi, Sahilwal, Jersey, Brown Swiss are breeds of
   (A) Pigs (B) Buffaloes (C) Cows (D) Fowl

7. Which of the following is not a type of biotic stress?
   (A) diseases (B) insect (C) frost (D) nematodes

8. Find out the correct sentence
   (i) Hybridisation means crossing between genetically dissimilar plants
   (ii) Cross between two varieties is called as inter specific hybridisation
   (iii) Introducing genes of desired character into a plant gives genetically modified crop
   (iv) Cross between plants of two species is called as inter varietal hybridisation
   (A) (i) and (iii) (B) (ii) and (iv) (C) (ii) and (iii) (D) (iii) and (iv)

9. Which of the following are exotic breeds?
   (i) Kangayam (ii) Jersey (iii) Brown Swiss (iv) Ongole
   (A) (i) and (iii) (B) (ii) and (iii) (C) (i) and (iv) (D) (ii) and (iv)

Space for rough work

10. Aleuroplasts in a cell store
(A) Carbohydrates (B) Proteins (C) Oils (D) Lipids

11. Which is the largest cell organelle present in plant cell?
(A) Nucleus (B) Chloroplast (C) Endoplasmic reticulum (D) Mitochondria

12. The phenomenon by which protoplast of a cell shrinks from the wall is
(A) Osmosis (B) Plasmolysis (C) Diffusion (D) Glycolysis

13. Which of the following statements is correct?
(A) Prokaryotic cells are surrounded by a cell membrane
(B) Prokaryotic cells have a nucleus
(C) Eukaryotic cells have genetic information
(D) Eukaryotic cells have membrane-bound organelles

14. The solution that has higher water concentration than the cell is known as
(A) Hypertonic (B) Hypotonic (C) Isotonic (D) None of these

15. Old organelles, viruses and bacteria that a cell can ingest are broken down in
(A) Ribosomes (B) Lysosomes (C) SER (D) RER

16. Mitochondria are sites of
(A) Oxygen generation (B) Carbon di oxide generation
(C) ATP generation (D) Glucose generation

17. A cell "X" contains a cell wall, large central vacuole and a nucleus at the periphery. The cell "X" is _____.
(A) Plant cell (B) Animal cell (C) Bacterial Cell (D) Prokaryotic cell

18. Raisins soaked in high concentrated solution of sugar ____i_____. The process involved is known as ___ii____.
(A) i- shrinks, ii- endosmosis (B) i- swells, ii- Exosmosis
(C) i- shrinks, ii- exosmosis (D) i- swells, ii- endosmosis

19. The term cell is not applied for
(A) Algae (B) Bacteria (C) Virus (D) Fungi

20. Amoeba, Paramecium and Bacteria are all examples of
(A) Multicellular organisms (B) unicellular organisms
(C) oligocellular organisms (D) eutelic organisms

Space for rough work

21. Leucoplasts are colourless plastids which are found in the cells of
(A) Flowers (B) roots (C) leaves (D) ripened fruits

22. The fluid mosaic model of plasma membrane given by singer and Nicolson is applicable:
(A) Only to eukaryotic cell membrane
(B) Only to organelle membranes
(C) Only to the prokaryotic cell membranes
(D) Both prokaryotic and Eukaryotic cell membrane and membranes of organelle

23. Name the tissues that are involved in the formation of coverings or protective tissues.
(A) Epithelial tissue (B) Nervous tissue (C) Muscular tissue (D) Connective tissue

24. Which of the following does not belong to the class of covering and lining epithelium?
(A) Simple squamous epithelium (B) Glandular epithelium
(C) Simple cuboidal (D) Simple columnar

25. Name the epithelium which consists of two or more than two layers of cells that protect the core tissues?
(A) Simple squamous epithelium (B) Simple columnar epithelium
(C) Stratified squamous epithelium (D) Simple cuboidal epithelium

26. Xylem and phloem are examples of
(A) epidermal tissue (B) simple tissue (C) protective tissue (D) complex tissue

27. Sieve tubes and companion cells are present in
(A) xylem (B) phloem (C) cork (D) cambium

28. A tissue whose cells are capable of dividing and re-dividing is called
(A) complex tissue (B) connective tissue (C) permanent tissue (D) meristematic tissue

29. Tissue responsible for buoyancy in aquatic plants is
(A) aerenchyma (B) chlorenchyma (C) collenchymas (D) sclerenchyma

30. Myosin is the protein present in
(A) epithelial tissue (B) muscle tissue (C) nervous tissue (D) skeletal tissue

31. Cartilage and bone are types of
(A) muscular tissue (B) connective tissue (C) meristematic tissue (D) epithelial tissue

32. Which of the following is not transferred by houseflies?
(A) Typhoid (B) Cholera (C) Dysentery (D) AIDS

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33. Fever, slow pulse, abdominal tenderness and rose coloured rash indicate the disease
(A) Measles (B) Typhoid (C) Chickenpox (D) Tuberculosis

34. An organism which harbours a pathogen and may pass it on to another person to cause a disease is known as
(A) Host (B) Vector (C) Parasite (D) Predator

35. The infective stage of plasmodium to human is
(A) sporozoite (B) merozoite (C) cryptozoite (D) gametocyte

36. Vaccine for smallpox was discovered by
(A) Louis Pasteur (B) Alexander Fleming (C) Edward Jenner (D) Robert Brown

37. Which of the following provides natural passive immunity
(A) vaccine (B) serum injection (C) colostrums (D) cerebrospinal fluid

38. Which of the following viral disease is transmitted through water?
(A) Rabies (B) Hepatitis (C) Dengue (D) Leprosy

39. World ozone day is celebrated on
(A) October 14th (B) September 16th (C) November13th (D) June 5th

40. _____ and _____ are combination of Agroforestry
(A) Fodder crops, fibre crop (B) Food crops, fibre crop
(C) Trees, grasses (D) Food crops, tree crop

41. A non-renewable source of energy is
(A) Wild life (B) Fossils fuels (C) Water (D) Forest

42. According to IUCN red list, what is the status of Red Panda (Ailurus fulgens)
(A) Critically endangered (B) Endangered species
(C) Vulnerable species (D) Extinct species

43. An example of ex-situ conservation is
(A) Seed bank (B) Sacred groves (C) National parks (D) Wildlife Sanctuary

44. Which one is a sedimentary cycle?
(A) Oxygen cycle (B) hydrogen cycle (C) nitrogen cycle (D) phosphorous cycle

45. The life supporting zone of earth is called as
(A) Lithosphere (B) hydrosphere (C) atmosphere (D) Biosphere

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