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.

Directions (Q.1 to Q.5): Piyush, Kadir khan, Rajeev, Sunanda, Trilochan and Urvashi are six members of a family. Each one is engaged in a different profession i.e, Doctor, Lawyer, Teacher, Engineer, Nurse and Banker and not necessarily in the same order

- Each one of them remain at home on a different day of the week from Monday to Saturday
- The lawyer in the family stays at home on Thursday
- Rajeev stays at home on Tuesday
- Piyush, a doctor, does not remain at home either on Wednesday or Saturday
- Sunanda is neither a lawyer nor a teacher, but she remains at home on Friday
- Kadir khan is an engineer
- Trilochan is a bank manager

1. Who is the nurse in the family?
   (A) Sunanda (B) Piyush (C) Uravashi (D) Rajeev

2. Who among them stays at home on the following day on which Rajeev stays at home?
   (A) Kadir Khan (B) Sunanda (C) Kadir Khan or Trilochan (D) Urvashi

3. Which of the following combinations are correct?
   (A) Rajeev – Teacher (B) Suananda – Nurse
   (C) Urvashi – Thursday (D) All are correct

4. What is the profession of Urvashi?
   (A) Engineer (B) Teacher (C) Lawyer (D) Doctor

5. Piyush stays at home on which day?
   (A) Monday (B) Tuesday (C) Saturday (D) None of these

Space for rough work

6. In a certain code, RATIONAL is written as RTANIOLA. How would TRIBAL be written in that code?
(A) TIRLBA (B) TIRALB (C) TIRABL (D) TRIALB

7. In a certain code language 'nee muk pic' means 'grave and concern', 'ill dic so' means 'every body else' and 'tur muk so' means 'body and soul'. Which of the following would mean 'every concern'?
(A) ill nee (B) pic nee
(C) dic pic (D) Cannot be determined

8. In a certain code language BEAT is written as YVZG, then what will be the code of MILD?
(A) ONWR (B) NROW (C) NOWR (D) ONRW

Directions (Q.9 to Q.13) Study the following information to answer the questions given below.
(i) Eight persons E, F, G, H, I, J, K and L are seated around a square table two on each side and facing inside.
(ii) There are three lady members and they are not seated next to each other
(iii) J is between L and F
(iv) G is between I and F
(v) H, a lady member, is second to the left of J
(vi) F, a male member, is seated opposite to E a lady member
(vii) There is a lady member between F and I

9. Who amongst the following are the three lady members?
(A) G, H and J (B) E, H and J (C) E, G and J (D) None of these

10. Who amongst the following is seated between E and H?
(A) F (B) G (C) J (D) None of these

11. Who amongst the following is to the immediate left to F?
(A) L (B) I
(C) J (D) Cannot be determined

12. How many persons are seated between K and F?
(A) One (B) Two
(C) Three (D) Cannot be determined

13. Which of the following is true about J?
(A) Position of J cannot be determined (B) J is male member
(C) Gender of J cannot be determined (D) None of the above

Space for rough work

Directions (Q.14 and Q.16) on the basis of the informations given below answer the questions. Eight friends A, B, C, D, E, F, G and H are sitting in a circle facing the centre. B is sitting between G and D. H is third to the left of B and second to the right of A.C is sitting between A and G. B and E are not opposite to each other

14. Who is third to the left of D?
(A) A (B) E (C) F (D) None of these

15. Which of the following statement is not true?
(A) C is third to the right of D (B) A is sitting between C and F
(C) D and A are sitting opposite to each other (D) E is sitting between F and D

16. In a row of boys facing the North, L is sixteenth from the left end and N is sixteenth from the right end. M, who is fourth to the right of L, is fifth to the left of N in the row. How many boys are there in the row?
(A) 40 (B) 44 (C) 42 (D) 43

17. In a class of strength 60, where girls are twice that of boys. Ketan ranked seventeenth from the top. If there are 9 girls ahead of Ketan, how many boys are after him in rank?
(A) 23 (B) 12 (C) 7 (D) 3

18. In a march past, seven persons are standing in a row. Q is standing left to R but right to P. O is standing right to N and left to P. Similarly, S is standing right to R and left to T. Find out who is standing in the middle?
(A) P (B) Q (C) R (D) D

19. If Anita is taller than Surjit but shorter than Kusum and Surjit is just as tall as Kalpana but taller than Vanita, then Kalpana is
(A) Just as tall as Anita (B) Taller than Kusum
(C) Shorter than Anita (D) Shorter than Surjit

20. In queue of children, Kashish is fifth from the left and Mona is sixth from the right. When they interchange their places between them, Kashish becomes thirteenth from the left. What will be Mona's position from the right?
(A) 4^{th} (B) 8^{th} (C) 14^{th} (D) 15^{th}

21. A car driver started his journey from a point and drove 10 km towards North and turned to his left and drove another 5 km. After waiting to meet one of his friends, he turned to his right and continued to drive another 10 km. He has covered a distance of 25 km so far but in which direction is he now be going?
(A) West (B) North (C) South (D) East

Space for rough work

Directions (Q.22 and Q.23) Answer these questions with reference to the information given below.
Anu, Romesh and Shivendra are children of Mr. and Mrs. Sharma, Rima, Raju and Sunil are children of Mr. and Mrs. Kaushik. Sunil and Anu are married are have two children named Amar and Shailesh. Geetika and Rahul are children of Mr. and Mrs. Bhardwaj. Geetika is married to shivendra and has three children named Rita, Sanjay and Ravi.

22. What is the surame of Shailesh?
(A) Bhardwaj (B) Kaushik (C) Sharma (D) Data inadequate

23. How is Rahul related to shivendra?
(A) Brother (B) Brother-in-law (C) Cousin (D) Uncle

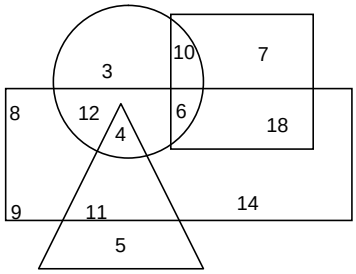
Directions (Q.24 and Q.25) In each question below are given two statements followed by two conclusions numbered I and II. You have to take the given two statements to be true even if they seem to be at variance from commonly known facts. Red the conclusion and then decide which of the given conclusions logically follow from the two given statements, disregarding known facts.

24. **Statements**
I. Some aeroplanes are living beings II. Some living beings are ghosts
Conclusions
I. Some aeroplanes are ghosts II. Some aeroplanes are not ghosts
Give answers
(A) Only Conclusion I follows (B) Only Conclusion II follows
(C) Either Conclusion I or II follows (D) Neither I nor II follows

25. **Statement**
I. All men are vertebrates II. Some mammals are vertebrates
Conclusions
I. All men are vertebrates II. Some vertebrates are mammals
III. All vertebrates are men IV. All mammals are men
Give answer
(A) I and II follows (B) Only IV follows (C) Only I and III follows (D) None of these

Space for rough work

Directions (Q.26 to Q.28) The following questions are based on the diagram given below
(i) Rectangle represents males
(ii) Triangle represents educated
(iii) Circle represented urban
(iv) Square represents civil servants

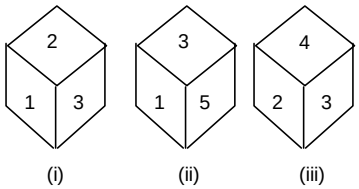


26. Who among the following is an educated male who is not an urban resident?
(A) 4 (B) 5 (C) 9 (D) 11

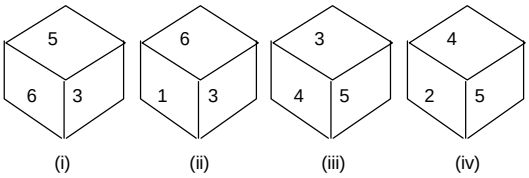
27. Who among the following is neither a civil servant nor educated but is urban and not a male.
(A) 2 (B) 3 (C) 6 (D) 10

28. Who among the following is uneducated and also an urban male but not civil servants.
(A) 2 (B) 3 (C) 11 (D) 12

29. A dice is thrown three times and its three different positions are given below. Find the number on the face opposite the face showing 3.
(A) 5 (B) 6
(C) 4 (D) 1



30. Figures shown here are, four different positions of the same dice. Find the number on the face opposite the face showing 6.
(A) 1 (B) 2
(C) 4 (D) 5



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.

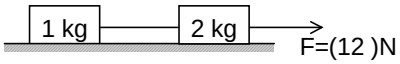
1. As Sound travels in air
   (A) particles of medium travel from one place to another
   (B) there is no moisture in the atmosphere
   (C) disturbance moves
   (D) both particles as well as disturbance travel from one place to another.

2. If the frequency of a wave is $360s^{-1}$, the distance between subsequent compression & rarefaction is 1m. Then the velocity of wave is
   (A) 720 m/s (B) 180m/s (C) 360m/s (D) 90m/s

3. In SONAR, we use
   (A) ultrasonic waves (B) infrasonic waves
   (C) radio waves (D) audible sound waves

4. A body of weight w_1 is suspended from the ceiling of a room through a chain of weight w_2. The ceiling pulls the chain by a force.
   (A) w_1 (B) w_2 (C) $w_1 + w_2$ (D) $w_1 - w_2$

5. In the shown arrangement, In absence of friction between the blocks and surface, the tension in the string connecting the blocks would be



   (A) 4N (B) 2N (C) 8 N (D) none of these

6. A body of mass 2 kg moving on a horizontal surface with an initial velocity of 4 m/sec comes to rest after 2 sec. If one wants to keep this body moving on the same surface with a velocity of 4 m/sec, the force required is
   (A) 8 N (B) 4 N (C) zero (D) 2 N

7. If the tension in the cable of 1000 kg elevator is 1000 kg weight, the elevator
   (A) is accelerating upwards (B) is acceleration downwards
   (C) may be at rest or accelerating (D) may be at rest or in uniform motion

Space for rough work

8. A driver accelerates his car first at the rate of 1.8 m/s^2 and then at the rate of 1.2 m/s^2. The ratio of the velocity acquired by car in time t is equal to
(A) 2:3 (B) 1:2 (C) 2 :1 (D) 3 : 2

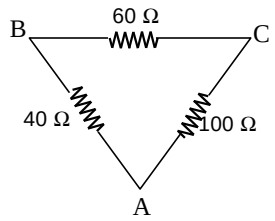
9. A force of 5 N acts on a body of weight 9.8 N. What is the acceleration produced in m/sec^2 ? Take g = 9.8 m/s^2
(A) 49 (B) 5 (C) 1.46 (D) 0.5

10. A wire carries a steady current of 1.0 A over a period of 20s. What total charge passes through the wire in this time interval
(A) 200 C (B) 20 C (C) 2.0 C (D) 0.20 C

11. Three resistances of 2, 3 and 5Ω are connected in parallel to a 10V battery of negligible internal resistance. The potential difference across the 3Ω resistance will be
(A) 2V (B) 3V (C) 5V (D) 10V

12. Two unequal resistance are connected in parallel. Which of the following statement is true
(A) current in same in both
(B) current is larger in higher resistance
(C) voltage-drop is same across both
(D) voltage-drop is lower in lower resistance

13. Three resistors are connected to form the sides of a triangle ABC as shown below. The resistance of side AB is 40 ohms, of side BC 60 ohms and of side CA 100 ohms. The effective resistance between the point A and B in ohms is
(A) 50 (B) 64
(C) 32 (D) 100



14. If one micro-amp. Current is flowing in a wire, the number of electrons which pass from one end of the wire to the other end in one second is
(A) 6.25×10^{12} (B) 6.25×10^{15} (C) 6.25×10^{18} (D) 6.25×10^{19}

15. Two wires of resistance R_1 and R_2 are joined in parallel. The equivalent resistance of the combination is
(A) R_1R_2/R_1+R_2 (B) R_1+R_2 (C) $R_1\times R_2$ (D) R_1/R_2

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. The carbon content in peat coal is
(A) 60% (B) 70% (C) 80% (D) 90%

17. Coal is used in the manufacture of
(A) Synthetic petrol (B) Coke (C) Coal gas (D) All of the above

18. Which of the following is used as 'aviation fuel' in jet aero planes?
(A) Gasoline (B) Kerosene (C) Diesel oil (D) Petroleum gas

19. Which of the following coal product is used as a roofing material?
(A) Coke (B) Coal tar (C) Coal gas (D) Ammonical liquor

20. Where was the first oil well drilled in India?
(A) Assam (B) Gujarat (C) Mumbai (D) Bangalore

21. One of the constituents of Vaseline is
(A) Bitumen (B) Paraffin wax (C) Lubricating oil (D) None

22. Which of the following measures are used to save petroleum?
(A) Drive at constant and moderate (B) Correct type pressure
(C) Both (D) None

Space for rough work

23. The process of carbonization is related to
(A) Petroleum (B) Coal (C) Natural gas (D) None

24. Coal gas is a mixture of
(A) $CO + H_2$ (B) $CO_2 + CH_4$ (C) $CO + H_2 + CH_4$ (D) $CH_4 + C_2H_6$

25. CNG is a _____ fuel
(A) Polluting (B) Non-polluting (C) Clean (D) Both (B) & (C)

26. You are given a solution of $AgNO_3$. Which of the following cannot displace Ag from $AgNO_3$ solution?
(A) Magnesium (B) Zinc (C) Gold (D) Copper

27. An element X reacts with hydrogen, when heated, it forms a hydride H_2X. If H_2X has a smell of rotten eggs, the element X is likely to be
(A) Carbon (B) Sulphur (C) Chlorine (D) Phosphorus

28. An element X forms two oxides XO and XO_2. The oxide XO is neutral but XO_2 is acidic in nature. The element X is most likely to be
(A) Sodium (B) Carbon (C) Calcium (D) Hydrogen

29. Which of the following term best describes the nature of zinc oxide?
(A) An acidic oxide (B) A basic oxide
(C) An amphoteric oxide (D) A neutral oxide

30. An element E reacts with water to form a solution, which turns phenolphthalein indicator pink. The element E is most likely to be
(A) S (B) Ca (C) C (D) N

Space for rough work

Mathematics

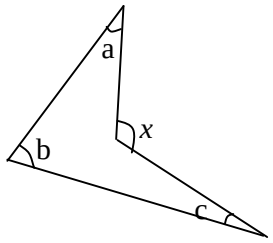
Straight Objective Type

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 square root of $(9+3\sqrt{5})(9-3\sqrt{5})$ is
    (A) $\sqrt{5}$ (B) 6 (C) 3 (D) $3\sqrt{5}$

32. What is the sum of the abscissa and ordinate of the point $(-2,-3)$
    (A) 5 (B) – 5 (C) 1 (D) – 1

33. In the given figure $x = ?$
    (A) $a+b-c$ (B) $a+b+c$
    (C) $a-b+c$ (D) $b+c-a$



34. If x = a, y = b is the solution of the equations x – y = 2 and x + y = 4, then the values of a and b are, respectively
    (A) 3 and 5 (B) 5 and 3 (C) 3 and 1 (D) – 1 and – 3

35. $a = \dfrac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$ then $a+\dfrac{1}{a}$ is equal to _____
    (A) 4 (B) 6 (C) 8 (D) 10

36. Find the value of $\sqrt{7\sqrt{7\sqrt{7.....}}}\infty$
    (A) 5 (B) 7 (C) 3.5 (D) 49

37. Speed of motorboat in still water is 45 kmph. If the motorboat travels 80 km along the stream in 1 hour 20 minutes, then the time taken by it to cover the same distance against the stream will be
    (A) 3 hours (B) 1 hour 20 minutes
    (C) 2 hours 40 minutes (D) 55 minutes

Space for rough work

38. The sum of the squares of 2 numbers is 146 and the square root of one of them is $\sqrt{5}$. The cube of the other number is
(A) 1111 (B) 1221 (C) 1331 (D) 1441

39. ABCD is a parallelogram with $\angle A = 80^o$. The internal angle bisectors of $\angle B$ and $\angle C$ meets at *O*. Find the $\angle BOC$.
(A) 60^o (B) 70^o (C) 80^o (D) 90^o

40. If each exterior angle of a regular polygon is 60^o then it is a
(A) pentagon (B) octagon (C) hexagon (D) decagon

41. Find the mean of following data:
$1^2, 2^2, 3^2, ... 20^2$
(A) 132.5 (B) 140 (C) 143.5 (D) 148

42. The parallel sides of a trapezium are 20 cm and 10 cm. Its non-parallel sides are both equal, each being 13 cm. Find the area of trapezium.
(A) 390 cm^2 (B) 200 cm^2 (C) 180 cm^2 (D) 130 cm^2

43. The value of $\sqrt{10+\sqrt{25+\sqrt{108+\sqrt{154+\sqrt{225}}}}}$ is
(A) 4 (B) 6 (C) 8 (D) 10

44. The value of $0.\overline{23}+0.\overline{22}$ is
(A) $0.\overline{45}$ (B) $0.\overline{43}$ (C) $0.4\overline{5}$ (D) 0.45

45. The multiplicative inverse of $(x+1)+\frac{1}{(x-1)}$ is
(A) $\frac{1}{(x+1)}+(x-1)$ (B) $(x-1)-\frac{1}{(x+1)}$ (C) $\frac{x-1}{x^2}$ (D) $\frac{x+1}{x^2}$

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. The outer membrane found in an animal cell is
   (A) cell wall (B) cell membrane (C) nuclear membrane (D) cytoplasm

2. Spyrogyra is
   (A) An algae (B) A fungi (C) A protozoa (D) A bacteria

3. Watering the crops is called:
   (A) sowing (B) manuring (C) tilling (D) irrigation

4. Save forest by
   (A) deforestation (B) overgrazing (C) digging of mines (d) none of these

5. Organisms lacking a nucleus and membrane-bound organelles are called
   (A) diploid (B) haploid (C) prokaryotes (D) eukaryotes

6. Vaccine for small pox is discovered by
   (A) Louis Pasteur (B) Alexander Fleming (C) Edward Jenner (D) John Mendal

7. Weeds are the:
   (A) main crop plants (B) insects and pests
   (C) unwanted plants growing along the crop (D) chemical substances

8. Study the following statements.
   (a) Forests are complex habitats and require fertilizer use.
   (b) Wild animals transfer seeds and increase forest areas.
   (c) Cutting forest trees on a large scale will disturb the decomposer cycle.
   (d) Education of people is important in forest conservation.
   Select the alternative which includes correct statements.
   (A) a and c (B) b, c and d (C) b and d (D) a and d

9. Relatively large vacuoles are present in
   (A) all prokaryotes (B) all eukaryotes (C) plant cells (D) animal cells

Space for rough work

10. Amount of nitrogen in the atmosphere is
(A) 58% (B) 68% (C) 78% (D) 88%

11. Combines are used for:
(A) sowing of seeds (B) harvesting the crops
(C) threshing (D) harvesting and threshing both

12. The animal found in Ranthambore National Park of Rajasthan is
(A) elephant (B) tiger (C) lion (D) bear

13. The growth of cells is regulated by
(A) Mitochondrion (B) vacuole (C) nucleus (D) Golgi complex

14. Mushroom belongs to
(A) Algae (B) Virus (C) Fungi (D) None of these

15. Separating grains from chaff is called:
(A) winnowing (B) threshing (C) fallow (D) harvesting

16. A similarity among black buck, *gharial,* rhinoceros and marsh crocodile is that the they are
(A) animals with thick chitinous skin (B) oviparous
(C) endangered species (D) found in the forests of North-East India

17. The centriole is associated with
(A) DNA synthesis (B) spindle formation (C) reproduction (D) respiration

18. Amoeba belongs to
(A) Algae (B) Fungi (C) Protozoa (D) Virus

19. Weedicides are used to destroy:
(A) insects (B) weeds (C) pests (D) none of these

20. Wildlife conservation act is made for
(A) conservation of forests (B) conservation of wild animals
(C) conservation of plants (D) both b & c

21. Proteins are formed in the
(A) Golgi complex (B) mitochondria (C) plastids (D) ribosomes

Space for rough work

22. Scientist who discovered fermentation is
(A) Alexander Fleming (B) Louis Pasteur (C) John Mendal (D) Edward Jenner

23. Kharif crops are sown in
(A) March, April (B) May, June (C) October, November (D) Any time

24. Natural disasters include
(A) earthquake (B) flood (C) storm (D) all of these

25. The name suicide bag has been given is
(A) centrioles (B) ribosome (C) mitochondrion (D) lysosome

26. Rhizobium bacteria
(A) Help in digestion (B) Help in nitrogen fixation
(C) Cause diseases (D) All of the above

27. Wheat and gram belong to
(A) Rabi crops (B) Kharif crops (C) Both of these (D) None of these

28. To protect our flora, fauna and their habitats, protected areas called sanctuaries, National Parks and Biosphere Reserves have been earmarked. In the following statements, sanctuaries, National Parks and Biosphere Reserves have been defined. Read the statements and mark the correct choice for each.
(i) Areas reserved for wildlife where animals can freely use the habitats and natural resources.
(ii) Large areas of protected land for conservation of wild life, plant and animal resources and traditional life of the tribals living in the area.
(iii) Areas where animals are protected from any disturbance to them and their habitat.

(i)	(ii)	(iii)
(A) Sanctuary	National Park	Biosphere Reserve
(B) Biosphere Reserve	Sanctuary	National Park
(C) National Park	Biosphere Reserve	Sanctuary
(D) None of the above		

29. Genes are located on the
(A) nuclear membrane (B) chromosomes (C) lysosomes (D) cell membrane

30. Malaria Is caused by
(A) Protozoa (B) Virus (C) Algae (D) Bacteria

Space for rough work

31. Examples of kharif crops are
(A) Wheat and maize (B) Gram and maize (C) Paddy and maize (D) All of these

32. Which of the following statements is/are false?
(i) Bori wildlife sanctuary is situated at Pachmarhi Biosphere Reserve.
(ii) Satpura National Park is the first reserve forest of India.
(iii) Red Data Book is the source book which keeps a record of all the endangered animals
(iv) There are different Red Data Books for plants, animals and other species.
(A) (i) and (iv) (B) (i), (ii) and (iv) (C) (iii) only (D) None of these

33. Biological membrane includes
(A) only nuclear membrane
(B) only membranes of Golgi complex
(C) only mitochondrial membrane
(D) all the intracellular membranes along with plasma membrane

34. Penicillium is a
(A) Algae (B) Fungus (C) Bacteria (D) Yeast

35. 2-4D is a
(A) Pesticide (B) Insecticide (C) Fungicide (D) Weedicide

36. Given below are some possible reasons for a sharp decline in population of the species given in figure. Which of the following are correct?

(i) Cleared forests (ii) Reforestation
(iii) Polluted air and water (iv) Scarcity of food
(A) (i) and (ii) (B) (i) and (iv) (C) (i), (ii) and (iv) (D) (i), (ii), (iii) and (iv)

Space for rough work

37. Which of the following is the main difference between onion peel cells and human cheek cells?
(A) Presence of mitochondria in onion peel cells only
(B) Presence of cell wall in onion peel cells only
(C) Absence of plasma membrane in cheek cells
(D) Absence of endoplasmic reticulum in cheek cells

38. Microorganisms are
(A) Unicellular (B) Multi-cellular (C) Both (D) None of these

39. Seed drill is used to
(A) sow the seeds (B) remove the weeds
(C) remove the pest (D) mix manure in the soil.

40. A habitat change may result in the decline of the numbers of a given species. Such species slowly become *P*. This means that the species are on the verge of becoming *Q*. Some animals whose number has gone down to critically low levels are called *R.* A species is considered *S* when no member of the species is still alive. Which of the following is correct sequence for *P, Q, R* and *S* in the above paragraph?

	P	**Q**	**R**	**S**
(A)	Vulnerable	Endemic	Extinct	Endangered
(B)	Endangered	Vulnerable	Threatened	Extinct
(C)	Vulnerable	Endangered	Critically endangered	Extinct
(D)	Endangered	Critically endangered	Extinct	Vulnerable

41. Centrioles are found in
(A) onion peel cells (B) human cheek cells (C) all plant cells (D) none of these

42. Cell wall is
(A) semipermeable (B) permeable
(C) differentially permeable (D) none of these

43. Which of the following reproduces only inside a host cell?
(A) Bacteria (B) Virus (C) Amoeba (d) Fungus

44. A disease in human beings caused by virus is _____.
(A) typhoid (B) influenza (C) dysentry (D) cholera

45. Cutting down forests and using the land for other purposes is known as deforestation. It has adverse effects on the environment. Which of the following are correct regarding these effects?
(i) Decrease in soil erosion (ii) Increase in temperature
(iii) Ground water level gets lowered (iv) Droughts and floods
(v) Increase in water holding capacity of the soil.

(A) (i), (ii), (iii) and (iv) (B) (ii), (iv) and (v)
(C) (ii), (iii) and (iv) (D) (i), (ii), (iv) and (v)

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