



BOTANY

SECTION-A

1. Given below are two statements, Assertion (A) and Reason (R). Choose the **correct** option for them.

Assertion (A): Gametes receive only one allele of a gene.

Reason (R): During gamete formation, homologous chromosomes segregate.

- (1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A)**.
(2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.
(3) **Assertion (A)** is true, and **Reason (R)** is false.
(4) **Assertion (A)** is false, and **Reason (R)** is true.

2. Mendel proposed that the factor controlling any character is discrete and independent. His proposition was based on the;

- (1) results of F_3 generation of a cross.
(2) observations that the offspring of a cross made between the plants having two contrasting characters shows only one character without any blending.
(3) self-pollination of F_1 offsprings.
(4) cross pollination of F_1 generation with recessive parent.

3. The concept of carrying capacity is associated with;

- (1) maximum population size that a species can reach.
(2) minimum population size required to prevent extinction.
(3) optimum population size for genetic diversity.
(4) the number of individuals required for successful reproduction.

4. Find the **incorrect** statement w.r.t the Pteridophytes:

- (1) Pteridophytes are used for medicinal purposes and as soil-binders.
(2) Evolutionarily, they are the first terrestrial plants to possess vascular tissues – xylem and phloem.
(3) In pteridophytes, the main plant body is a gametophyte.
(4) The pteridophytes are found in cool, damp, shady places though some may flourish well in sandy-soil conditions.

5. _____ of an ecosystem is the rate of production of organic matter during photosynthesis.

- (1) Net primary productivity
(2) Secondary productivity
(3) Gross primary productivity
(4) None of the above

6. Read the given statements carefully and choose the **correct** option.

Statement I: The 'bakanae' (foolish seedling) disease of rice seedlings, was caused by a fungal pathogen *Gibberella fujikuroi*.

Statement II: E. Kurosawa reported the appearance of symptoms of the bakanae disease in rice seedlings when they were treated with sterile filtrates of the fungus later identified as cytokinins.

- (1) Statement I and Statement II both are correct.
(2) Statement I is correct but Statement II is incorrect.
(3) Statement I is incorrect but Statement II is correct.
(4) Statement I and Statement II both are incorrect.

7. True nucleus is absent in;

- (1) *Funaria* (2) *Volvox*
(3) *Anabaena* (4) *Mucor*

8. Identify the correct statements about pollen grain and choose the **correct** option.

- (A) It has two layered prominent wall.
(B) Hard outer wall layer.
(C) Inner wall is composed of sporopollenin.
(D) Sporopollenin forms continuous exine.

- (1) A, B, C, D (2) A, B, C only
(3) A, B only (4) B, D only

9. The terminator site and the promoter site for transcription are located at;

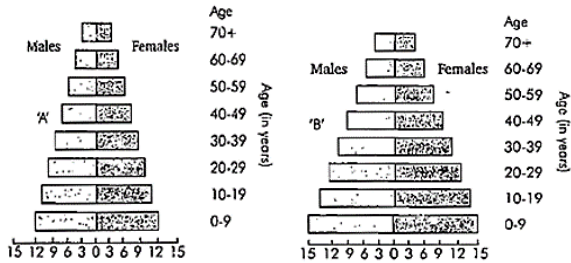
- (1) 3' (downstream) end and 5' (upstream) end, respectively of the transcription unit.
(2) 5' (upstream) end and 3' (downstream) end, respectively of the transcription unit.
(3) the 5' (upstream) end.
(4) the 3' (downstream) end.

(4) **Assertion (A)** is false, and **Reason (R)** is true.



17. In which phase of mitosis, chromosomes lose their individuality?
- (1) Prophase
 - (2) Metaphase
 - (3) Anaphase
 - (4) Telophase
18. During chemiosmosis, the function of primary acceptor of electron is to;
- (1) transport proton from the stroma to lumen.
 - (2) transport proton from the lumen to stroma.
 - (3) donate proton to a proton carrier.
 - (4) donate electron to a proton carrier.
19. Read the given statements carefully and choose the **correct** option.
- Statement I:** The dicot plants not only show open form of growth but also have open vascular bundles.
- Statement II:** Plant growth can be measured only in the form of absolute growth rate.
- (1) Statement I and Statement II both are correct.
 - (2) Statement I is correct, but Statement II is incorrect.
 - (3) Statement I is incorrect, but Statement II is correct.
 - (4) Statement I and Statement II both are incorrect.
20. In the following question, a statement of assertion is followed by a statement of reason. Choose the **correct** option for them.
- Assertion (A):** The axonemal microtubules (9+2 array) are arranged in a cylindrical manner throughout the length of cilium or flagellum.
- Reason (R):** The base of a cilium or flagellum is made up of centriole-like structure.
- (1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A)**.
 - (2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.
 - (3) **Assertion (A)** is true, and **Reason (R)** is false.
 - (4) **Assertion (A)** is false, and **Reason (R)** is true.
21. The evolution of the C_4 photosynthesis system is probably one of the strategies for;
- (1) minimizing the availability of CO_2 .
 - (2) maximizing the water loss.
 - (3) maximizing the availability of CO_2 while maximizing the water loss.
 - (4) maximizing the availability of CO_2 while minimizing the water loss.
22. After the primary producer level in an ecosystem;
- (1) less and less amount of new chemical energy is added at successive trophic levels.
 - (2) no new chemical energy is added at successive trophic levels.
 - (3) more and more amount of new chemical energy is added at successive trophic levels.
 - (4) less amount of new chemical energy is added at primary consumer level and then the amount of new chemical energy added to successive levels becomes more and more.
23. **Assertion (A):** Glucose is oxidized in several small steps.
- Reason (R):** The energy released during respiration can be coupled to synthesize ATP.
- (1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A)**.
 - (2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.
 - (3) **Assertion (A)** is true, and **Reason (R)** is false.
 - (4) **Assertion (A)** is false, and **Reason (R)** is true.
24. **Statement I:** The parenchymatous cells which lie between the xylem and the phloem are called conjunctive tissue in dicot root.
- Statement II:** In dicot root, pericycle takes part in the formation of vascular cambium.
- (1) Statement I and Statement II both are correct.
 - (2) Statement I is correct, but Statement II is incorrect.
 - (3) Statement I is incorrect, but Statement II is correct.
 - (4) Statement I and Statement II both are incorrect.

25. A country with a high rate of population growth took measures to reduce it. The figure below shows age sex pyramids of populations A and B twenty years apart. Select the **correct** interpretation about them.



- (1) 'A' is more recent and shows slight reduction in the growth rate.
- (2) 'B' is earlier pyramid and shows stabilized growth rate.
- (3) 'B' is more recent showing that population is very young.
- (4) 'A' is the earlier pyramid and no change has occurred in the growth rate.

26. One of the major difficulties in the biological control of insect/pest is that;

- (1) the method is less effective as compared with the use of insecticides.
- (2) the practical difficulty of introducing the predator to specific areas.
- (3) the predator develops a preference to other diets and may itself become a pest.
- (4) the predator does not always survive when transferred to a new environment.

27. The nurses working in the maternity ward of a hospital suspect that they have accidentally mixed up three babies when tagging them after birth. Blood typing of the three couples and the three babies involved was done to match each baby to the right family. The following results were obtained;

Baby 1: Type B	Baby 2: Type A
Baby 3: Type O	
Mr Singh: Type O	Mrs Singh: Type AB
Mr Sisodia: Type A	Mrs Sisodia: Type O
Mr Mehra: Type AB	Mrs Mehra: Type B

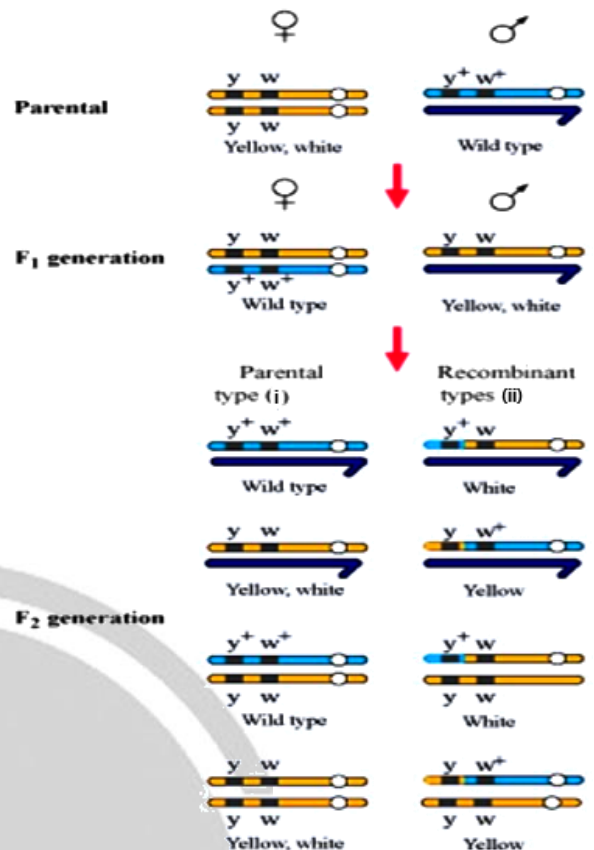
What can be inferred from the above data?

- (1) Baby 1 belongs to the Singh family.
- (2) Baby 2 belongs to the Mehra family.
- (3) Baby 3 belongs to the Sisodia family.
- (4) All of the above

28. Respiratory infection is caused by;

- (1) Adenovirus
- (2) TMV
- (3) *Propionibacterium*
- (4) HIV

- 29.



In above diagram, (i) & (ii) respectively, are;

- (1) (i) – 62.8%, (ii) – 37.2%
- (2) (i) – 98.7%, (ii) – 1.3%
- (3) (i) – 37.2%, (ii) – 62.8%
- (4) (i) – 1.3%, (ii) – 98.7%

30. Which of the following statements is **incorrect** regarding gymnosperms?

- (1) Leaves of gymnosperms are well adapted to withstand extremes of temperature, humidity and wind.
- (2) In *Pinus* the pinnate leaves persist for a few years.
- (3) In *Cycas* stems are unbranched.
- (4) In *Pinus* male or female cones are borne on the same tree.

31. **Assertion (A):** Interphase nucleus has a loose and indistinct network of nucleoprotein fibres.

Reason (R): During different stages of cell division, cells show structured chromosomes.

- (1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A)**.
- (2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.
- (3) **Assertion (A)** is true, and **Reason (R)** is false.
- (4) **Assertion (A)** is false, and **Reason (R)** is true.

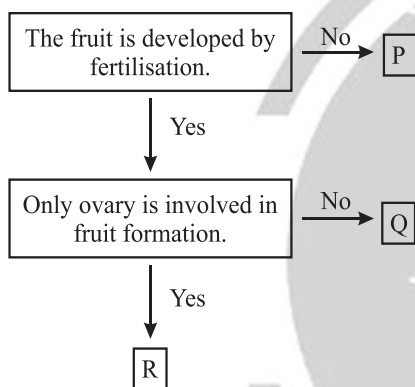


32. Match **List-I** with **List-II** to find out the **correct** option.

List I (Scientist)		List II (Discovery)	
(I)	Joseph Priestley	(A)	Green plant parts synthesize sugar
(II)	Jan Ingenhousz	(B)	Source of oxygen is H_2O , not CO_2
(III)	Julius von Sachs	(C)	Oxygen is released from the green parts of the plants
(IV)	Cornelius van Niel	(D)	Plants purify fouled air

- | | I | II | III | IV |
|-----|---|----|-----|----|
| (1) | A | D | C | B |
| (2) | D | B | C | A |
| (3) | B | A | C | D |
| (4) | C | D | A | B |

33. Refer to the given flow chart and identify P, Q and R.



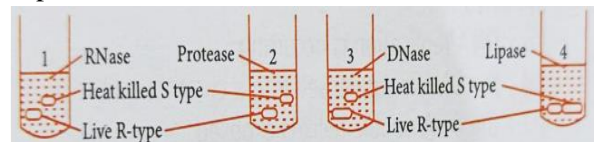
- | | P | Q | R |
|-----|------------|---------|-----------|
| (1) | Strawberry | Orange | Cashew |
| (2) | Banana | Apple | Mango |
| (3) | Castor | Coconut | Pea |
| (4) | Mulberry | Mustard | Coriander |

34. Match **List-I** with **List-II** and select the **correct** option.

List-I		List-II	
(I)	Family	(A)	<i>tuberosum</i>
(II)	Kingdom	(B)	Polymoniales
(III)	Order	(C)	<i>Solanum</i>
(IV)	Specific epithet	(D)	Plantae
(V)	Genus	(E)	Solanaceae

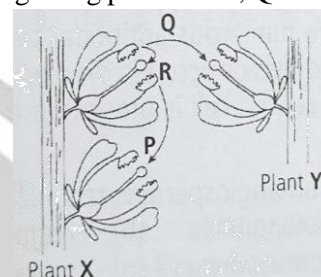
- | | I | II | III | IV | V |
|-----|---|----|-----|----|---|
| (1) | E | D | B | A | C |
| (2) | E | D | A | C | B |
| (3) | A | B | C | E | D |
| (4) | B | A | C | D | E |

35. Study the following figures and identify the **correct** option where transformation of R type into S type will occur, w.r.t Griffith's transformation experiments.



- (1) Only in 3
- (2) In both 1 and 2
- (3) In both 2 and 3
- (4) In 1, 2 and 4

36. Refer to the given diagram and select the **correct** option regarding processes P, Q and R.



- (1) Processes P, Q and R introduce genetic variability in the offspring of sexually reproducing plants X and Y.
- (2) Water serves as agent for process Q if plants X and Y belong to genus *Salvia*.
- (3) Flowers of plants X and Y need to produce odour and nectar for completion of processes P and Q if they are entomophilous.
- (4) If plants X and Y belong to genus *Zostera*, then their flowers need to produce sticky and heavy pollens in very small amount for accomplishment of process Q.

37. Identify the true statement(s) from the following and choose the **correct** option.

- A. Centrioles are spherical structures that lie parallel to each other.
- B. Centrioles have an organization like cartwheel.
- C. Centrioles are made up of nine evenly spaced peripheral fibrils of tubulin protein.
- D. Each peripheral fibril of centriole is triplet.

- (1) A, B and D only
- (2) A and C only
- (3) B, C and D only
- (4) A, C and D only



38. **Statement I:** *Neurospora* is extensively used in biochemical and genetical studies.

Statement II: Both *Claviceps* and *Neurospora* have conidia present endogenously on branched or unbranched conidiophores.

- (1) Statement I and Statement II both are correct.
- (2) Statement I is correct, but Statement II is incorrect.
- (3) Statement I is incorrect, but Statement II is correct.
- (4) Statement I and Statement II both are incorrect.

39. During alcoholic fermentation by yeast two molecules of glucose produce:

- (1) 3 molecules of ethanol + 3 molecules of CO_2
- (2) 6 molecules of ethanol + 6 molecules of CO_2
- (3) 2 molecules of ethanol + 2 molecules of CO_2
- (4) 4 molecules of ethanol + 4 molecules of CO_2

40. The birth and death rates of four countries are given below. Which one will have the least population growth rate?

Country	Birth rate/1000	Death rate/1000
P	15	5
Q	25	10
R	35	18
S	48	41

- (1) P
- (2) Q
- (3) R
- (4) S

41. Formation of ribosomal Rna occurs in;

- (1) Golgi apparatus
- (2) Nucleolus
- (3) Microbodies
- (4) Ribosomes

42. What will be the amount of DNA in meiosis I products if a meiocyte contains 20 pg DNA in G1 phase?

- (1) 10 pg
- (2) 20 pg
- (3) 40 pg
- (4) 80 pg

43. Select the group of taxa representing the same category of taxonomic hierarchy.

- (1) sativum, tuberosum, indica
- (2) Solanum, nilotica, Brassica
- (3) Potato, tomato, Fabaceae
- (4) Petunia, Datura, Solanaceae

44. Read the following statements and choose **correct** option.

Statement-I: Root cap protects the root. meristem from the friction of the soil.

Statement-II: Meristematic zone cells are thick walled.

- (1) Both statement I and II are correct.
- (2) Statement I is correct but statement II is incorrect.
- (3) Statement I is incorrect but statement II is correct.
- (4) Both statement I and II are incorrect.

45. **Assertion (A):** Ovary in hypogynous flowers is said to be superior.

Reason (R): Gynoecium in such flowers occupies the highest position, while other parts are situated below it.

- (1) Both **Assertion (A)** and **Reason (R)** are the true and **Reason (R)** is a correct explanation of **Assertion (A)**.
- (2) Both **Assertion (A)** and **Reason (R)** are the true but **Reason (R)** is not a correct explanation of **Assertion (A)**.
- (3) **Assertion (A)** is true and **Reason (R)** is false.
- (4) **Assertion (A)** and **Reason (R)** both are false.

46. Radial vascular bundle means;

- (1) Xylem and Phloem at the different radius in Stem
- (2) Xylem and Phloem at different radius in root
- (3) Xylem and Phloem at same radius in Stem
- (4) Xylem and Phloem at same radius in leaf

47. ABA acts as an antagonist to;

- (1) NAA
- (2) IBA
- (3) IAA
- (4) GAs

48. Two species competing for the same resource can avoid competition by choosing different habits. This phenomenon is called _____ and was supported by _____.

- (1) competitive exclusion, Gause
- (2) competitive exclusion, MacArthur
- (3) resource partitioning, Gause
- (4) resource partitioning, MacArthur



49. The first step of alcoholic fermentation from pyruvate is;

- (1) Dehydrogenation
- (2) Oxidation
- (3) Decarboxylation
- (4) Oxidative decarboxylation

50. How many molecules of RuBP & CO₂ respectively are required for the production of 6 molecules of 3-PGA?

- | | |
|-------------|-------------|
| (1) 3 and 2 | (2) 2 and 3 |
| (3) 3 and 3 | (4) 3 and 1 |



PW Web/App - <https://smart.link/7wwosivoicgd4>

Library- <https://smart.link/sdfez8ejd80if>