

JRF- 2021

7. Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : While alloinfection increases disease incidence, the autoinfection increases the disease severity

Reason R : Neither autoinfection nor alloinfection is sufficient to cause disease epidemics

In light of the above statements, choose the correct answer from the options given below

1. Both A and R are true and R is the correct explanation of A
2. Both A and R are true but R is NOT the correct explanation of A

3. A is true but R is false

4. A is false but R is true

8. Match List I with List II

List I	List II
A. Dipicolinic acid	I Filter sterilization
B. Myeoplasmas	II. Endospore
C. Heatlabile liquids	III. Endospore
D. Steam under pressure	IV. Autoclave

Choose the correct answer from the options given below:

1. A-II, B- IV, C -I. D - II
- 2. A-II B - III, C - I. D -IV**
3. A- II B - II. C - IV, D - I
4. A-II, B - II, C - IV, D – I

9. Chronological steps in the development of genotype and release of a crop variety

- A. Preliminary yield trial
- B. Genotype development
- C. Multilocational trial
- D. Notification of variety
- E. Identification of variety

Choose the correct answer from the options given below

1. B-C-A -E -D
- 2. B-A- C -E -D**
3. B-A-C -D -E
4. E-B-A-C-D

10. Given below are two statements

Statement I: Fermentation of cattle dung produces biogas which can be used for cooking. and the slurry produced can be used as organic manure.

Statement II: Ethane is the primary constituents of biogas.

In light of the above statements, choose the most appropriate answer from the options given

Below

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

11. Panama wilt of banana caused by Fusarium osporum f. sp. cubense is an internationally known plant disease

- A. Gros Michel variety of banana is susceptible to race 1
- B. Gros Michel variety of banana is resistant to race 1
- C. Cavendish variety of banana is susceptible to race 4
- D. Cavendish variety of banana is resistant to race 4
- E. Both Gros Michel and Cavendish are susceptible to race 1

Choose the most appropriate answer from the options given below:

1. C and D only
2. D and E only
3. A and B only
- 4. A and C only**

12. Match List I with List II

List I	List II
A. Grow-out test	I. Test for vigour of the seed
B. Osmotic stress test	II. Test for genetic purity of seed
C. Viability test	III. Test for aliveness of seed
D. Brick gavel test	IV. Test using PEG and mannitol

Choose the correct answer from the options given below:

1. A-II, B - IV, C - II. D - I
2. A-IV., B - II C - I D - III|
- 3. A-II. B - IV, C - III, D - I**
4. A-IV, B - II. C - II D - I

13. Match List I with List II

List I	List II
A. Chlorosis	I. Fire blight of apple
B. Hyperplasia	II. Mosaic disease of tobacco
C. Epinasty	III. Bacterial wilt of tomato
D. Etiolation	IV. Crown gall of rose
E. Necrosis	V. Bakanae disease of rice

Choose the correct answer from the options given below:

1. A- III, B - IV, C- II. D - V, E - I
- 2. A - II B - IV, C - II, D - V, E - I**
3. A - I, B - V, C - II, D - IV, E - I
4. A -II B - V, C - I D - IV, E -II|

14. The Food and Agriculture Organization (FAO) of United Nations has declared
- 1. Cereals 2. Pulses**
3. Millets 4. Oilseeds
15. Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R
Assertion A: In reciprocal recurrent selection, the two populations so developed can be used as synthetic variety.
Reason R: In reciprocal recurrent selection, the GCA of both the population is improved simultaneously.
In light of the above statements, choose the correct answer from the options given below
- 1. Both A and R are true and R is the correct explanation of A!**
2. Both A and R are true but R is NOT the correct explanation of A
3. A is true but R is false
4. A is false but R is true
16. Given below are two statements
Statement I: Matthias Schleiden and Theodor Schwann proposed the first two components of the 'cell theory'.
Statement II: Rudolf Virchow proposed the third component of the 'cell theory'.
In light of the above statements, choose the most appropriate answer from the options given below
- 1. Both Statement I and Statement II are correct**
2. Both Statement I and Statement II are incorrect
3. Statement I is correct but Statement II is incorrect
4. Statement I is incorrect but Statement II is correct
17. Which of the following belong to Oomycetes
1. Pestalotia 2. Phyllosticta
3. Plasmapara 4. Puccinia
18. Recalcitrant seeds are
A. Susceptible to desiccation
B. Susceptible to freezing
C. Tolerant to desiccation but susceptible to freezing
D. Tolerant to freezing but susceptible to desiccation
E. Tolerant to desiccation and freezing both
Choose the most appropriate answer from the options given below:
- 3. A and B only**
1. C, D and E only 2. E only
3. A and B only 4. C and D only
19. The combination of the following crops yields the staple food of India

1. Wheat-Barley-Oats **2. Rice-Wheat-Maize**
 3. Wheat-Pulses-Oilseeds 4. Rice-Wheat-Millets
20. Arrange the following organelles starting from the center to periphery of the cell
- A. Golgi apparatus B. Nucleolus
 C. Rough endoplasmic reticulum
 D. Cell wall
 E. Plasma membrane
- Choose the correct answer from the options given below
1. C, A. B. D, E **2. B. C, A, E, D**
 3. B, A, C. E, D 4. C, B. A. E, D.
21. Given below are two statements, one is labelled as Assertion A and the other is labeled as Reason R
- Assertion A:** Phytoplasma is a motile bacterium
Reason R : Phytoplasma is transmitted by leaf hopper
- In light of the above statements, choose the correct answer from the options given below
1. Both A and R are true and R is the correct explanation of A
 2. Both A and R are true but R is NOT the correct explanation of A
 3. A is true but R is false
4. A, is false but R is true
22. Match List I with List II
- | List I | List II |
|---------------------|-----------------------------------|
| Human disease/trait | Onset of expression |
| A. Alkaptonuria | I. Before birth |
| B. Blood groups | II. About 1 year after birth |
| C. Baldness | III. Immediately after birth |
| D. Rickets | IV. About 20-25 years after birth |
- Choose the correct answer from the options given below:
- 1 A- II. B - I. C - II, D - IV
 2. A- I B - II. C - IV, D - II
 3. A-II, B - IV, C - III. D - I
4. A- III, B - II C - IV, D - II
23. Arrange the following events of phage replication in correct sequence
- A. Replication and synthesis
 B. Penetration
 C. Adsorption
 D. Lysis and release
 E. Assembly of phage particles

Choose the correct answer from the options given below

1. B, E, C, A, D
2. C .B. E, A. D
- 3. C, B. A. E, D**
4. B. C. A. E. D

24. Given below are two statements

Statement I: Rafi Ahmad Kidwai Award is bestowed by CSIR to a scientist of repute for contribution in the field of agriculture.

Statement II: ICAR awards Punjab Rao Deshmukh Woman Agricultural Scientist Award annually.

In light of the above statements, choose the correct answer from the options given below

1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
- 4. Statement I is false but Statement II is true**

25. Given below are two statements, one is labelled as Assertion A and the other is labelled as

Reason R

Assertion A: Plant disease symptoms need not harbor the pathogen propagules always

Reason R: Crown gall harbors Agrobacterium tumefaciens

In light of the above statements, choose the correct answer from the options given below

1. Both A and R are true and R is the correct explanation of A
2. Both A and R are true but R is NOT the correct explanation of A
- 3. A is true but R is false**
4. A is false but R is true

26. Given below are two statements, one is labelled as Assertion A and the other is labelled as

Reason R

Assertion A: Polycyclic diseases are known to cause plant disease epidemics

Reason R: Polycyclic disease inciting pathogens produce multiplicity of infections in short time

In light of the above statements, choose the correct answer from the options given below

- 1. Both A and R are true and R is the correct explanation of A**
2. Both A and R are true but R is NOT the correct explanation of A
3. A is true but R is false

4. A is false but R is true
- 27 Most of the energy in the cells is liberated by oxidation of carbohydrates when
A. Pyruvic acid is converted into sugar
B. Pyruvic acid is converted into acetyl-CoA
C. Sugar is converted into pyruvic acid
D. Glucose is converted into alcohol and CO₂
E. Pyruvic acid is converted into CO₂ and H₂O
Choose the most appropriate answer from the options given below:
1. A and B only 2. B and C only
3. A and D only 4. E only
28. Powdery mildew diseases of crop plants are incited by
1. Fungal Biotrophs 2. Bacterial Biotrophs
3. Fungal Hemibiotrophs 4. Fungal Necrotrophs.
29. Given below are two statements
Statement I: "Import Permits an official document needed to introduce in India any plant genetic resources from other countries.
Statement II: The 'Import Permit' is signed by the Director General, ICAR.
In light of the above statements, choose the correct answer from the options given below
1. Both Statement I and Statement II are true
2. Both Statement I and Statement II are false
3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true

30 Match List I with List II

List I	List II
A. Pseudomureins	I. Gram negative bacteria
B. Cell Outer Membrane	II. Bacteria
C. Algae-fungus association	III. Induction of Nod genes
D. Flavonoids	V. Lichens

Choose the correct answer from the options given below:

1. A - II, B - III, C - IV, D - I
2. A - II, B - I, C - IV, D - III
3. A - II, B - IV, C - II, D - I
4. A - II, B - II, C - IV, D - I

31 Which of the following statements are true while comparing prokaryotes and eukaryotes

- A. Prokaryotes have 70S ribosomes, eukaryotes have 80S ribosomes.
- B. Nuclear material is linear in both prokaryotes and eukaryotes.
- C. Meiosis is the characteristic of eukaryotes.
- D. Genetic exchange occurs in both prokaryotes and eukaryotes.
- E. Nuclear membrane is present in both prokaryotes and eukaryotes.

Choose the most appropriate answer from the options given below:

1. A, C and D only

2. A, B, C, D only

3. A, B, D, E only

4. A, C, E only

32. Match List I with List II

List I	List II
A. Discovery of human blood group	I B. McClintock
B. Double helical model of DNA	II Crick, Watson and Wilkins
C. Genetic improvement of Mexican wheat	III. K. Landsteiner
D. Mobile genetic elements in maize	IV. N. Borlaug

Choose the correct answer from the options given below:

1. A - I, B - II C - III, D - IV

2. A - II, B - I C - II, D - IV

3. A - III, B - I C - II, D - IV

4. A - III, B - II, C - IV, D - I

33. Given below are two statements

Statement I: American grapevine root stock helped the French farmers to control root aphids

Statement II: Root aphid resistant American root stock was also resistant to grapevine downy mildew

In light of the above statements, choose the most appropriate answer from the options given below

1. Both Statement I and Statement II are correct

2. Both Statement I and Statement II are incorrect

3. Statement I is correct but Statement II is incorrect

4. Statement I is incorrect but Statement II is correct

34. Given below are two statements, one is labelled as Assertion A and the other is labelled as

Reason R

Assertion A: Magnetic separator in seed processing unit separate the seeds based on seed surface texture and stickiness of the seeds

Reason R: Insect-damaged and partially filled seeds may appear to be same as the normal seeds in shape and size, but it varies in their specific gravity.

In light of the above statements, choose the correct answer from the options given below

1. Both A and R are true and R is the correct explanation of A

2. Both A and R are true but R is NOT the correct explanation of A

3. A is true but R is false

4. A is false but R is true

35 Given below are two statements, one is labelled as Assertion A and the other is labelled as

Reason R

Assertion A: Antibiotics are sterilized by bacteriological filters but not by heat

Reason R: Antibiotics are thermo labile compounds

In light of the above statements, choose the correct answer from the options given below

1. Both A and R are true and R is the correct explanation of A

2. Both A and R are true but R is NOT the correct explanation of A

3. A is true but R is false

4. A is false but R is true

36. Which of the following represents 'vertisol'

1. Black cotton soil

2. Sandy loam sodic soil

3. Submontane (Tarai) soil

4. Red loamy soil

37. Given below are two statements

Statement I: A phototrophic microorganism can derive all carbon requirements from the principal carbon source

Statement II: An auxotrophic microorganism requires one or more growth factors in addition to the principal carbon source

In light of the above statements, choose the most appropriate answer from the options given below

1. Both Statement I and Statement II are correct

2. Both Statement I and Statement II are incorrect

3. Statement I is correct but Statement II is incorrect

4. Statement I is incorrect but Statement II is correct

38. Match List I with List II

List I	List II
A. Rice	I GMO hybrid
B. Tobacco.	II GMO for shelf life
C. Tomato	III GMO for vitamin A
D. Cotton	IV. First GMO

Choose the correct answer from the options given below:

1. A - III, B - IV, C - II, D - I
 2. A - IV, B - II, C - I, D - III
 3. A - III, B - I, C - III, D - IV
 4. A - I, B - III, C - IV, D - I

39. Given below are two statements. One is labelled as Assertion A and the other is labelled as Reason R

Assertion A: In lysogenic cycle the viral nucleic acid does not hamper the function of host bacterium

Reason R : In lysogenic cycle the nucleic acid of phage gets incorporated into the host DNA and becomes a prophage, acting as a gene

In light of the above statements, choose the correct answer from the options given below

- 1. Both A and R are true and R is the correct explanation of A
 - 2. Both A and R are true but R is NOT the correct explanation of A
 - 3. A is true but R is false
 - 4. A is false but R is true

Match List I with List II

List I	List II
A. Main product of photosynthesis	I. Chloroplast
B. The energy-carrying molecule that cells use for energy	II Autotrophs
C. Organisms that make their own food	III. ATP
D. Organelle of photosynthesis	IV. Glucose

Choose the correct answer from the options given below:

1. A- I, B- II, C- III, D- IV
 2. A- IV, B- II, C- III, D- I
 3. A- I, B- III, C- II, D- IV
 - 4. A-IV, B- III, C- II, D- I**

41. Motile infective propagules are produced by

- Motile infective propagules are produced by**

 - A. Pythium
 - B. Phytophthora

C. Xanthomonas

D. Ralstonia

E. Nematodes

Choose the correct answer from the options given below:

1. Pythium and phytophthora possess pili
2. Pythium and phytophthora possess fimbria
3. Nematodes have flagella

4. Xanthomonas, and Ralstonia possess flagella

42. The events happening during RNA processing are:

- A. Capping at the 5' - end.
- B. Proof-reading of the nascent mRNA.
- C. Splicing of the introns and joining of the exons.
- D. Deadenylation at the 3' –end.
- E. Addition of poly-A tail at the 3' –end.

Choose the correct answer from the options given below:

1. A – B – D

2. A – C – E

3. B – D – E

4. B – C – D

43. In sea urchin DNA, which is double stranded, 10% of the bases are shown to be cytosine (C). Based on this observation, the following were recorded.

A. Guanine (G) are 10%

B. Adenine (A) are 40%

C. Thymine (T) are 20%

D. Purines are 50%

E. Purines are 50%

Choose the correct answer from the option given below:

1. A, B, C, and D only

2. A, B, C and E only

3. A, B, C and E only

4. A, C, D and E only

44. Seed coat is derived from

1. Nucellus

2. Embryo

3. Endosperm

4. Testa

45. Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: Foliar plant pathogen produce pigmented and colored spores

Reason R : The dark pigmentation helps the pathogens to adapt on foliar parts to withstand high radiations.

In light of the above statements, choose the correct answer from the options given below

1. Both A and R are true and R is the correct explanation of A

2. Both A and R are true but R is NOT the correct explanation of A

3. A is true but R is false

4. A is false but R is true

46. Match List I with List II

List I	List II
Crop	Ploidy level
A. Rice	I. Tetraploid
B. Bread wheat	II. Triploid
C. Durum wheat	III. Diploid
D. Seedless banana	IV. Hexaploid

Choose the correct answer from the options given below:

1. A – II, B – I, C – IV, D – III

2. A – III, B – IV, C – I, D – II

3. A – IV, B – I, C – II, D – III

4. A – I, B – IV, C – II, D - III

47. Given below are two statements, one is labelled as Assertion A and the Other is labelled as Reasons R.

Assertion A: In the Watson-Crick model of DNA, each turn of the helix is the length of 10 base pairs,

Reason R: Each complete turn of the double-stranded DNA helix is 3.4 \AA long.

In light of the above statements, choose the most appropriate answer from the options given below

1. Both A and R are correct R is the correct explanation of A

2. Both A and R are correct but R is NOT the correct explanation of A

3. A is correct but R is not correct

4. A is not correct but R is correct

48. Match List I with List II

List I	List II
Types of hybrid	Parental combination of the crosses
A. Three cross hybrid	I. (Inbred A \times Inbred B) \times Open pollinated variety

B. Modified single cross hybrid	II. Inbred A × Open pollinated variety
C. Double top- cross hybrid	III. (Inbred A × Inbred B) × Inbred C
D. Top cross hybrid	IV. (Inbred A × A') × Inbred B

Choose the correct answer from the options given below:

1. A – III, B – IV , C – II, D – I
2. A – III, B – I, C – IV D – II
- 3. A – III, B – IV , C – I, D – II**
4. A – I, B – IV, C- III, D – II

49. Match List I with List II

List I	List II
ICAR institute	Location of HQ
A. Indian Institute of Maize Research	I. Karnal
B, National Institute of Abiotic Stress Management	II. Hyderabad
C. Indian Institute of Rice Research	III. Ludhiana
D. Indian Institute of wheat and Barley Research	IV. Baramati

Choose the correct answer from the options given below:

1. A – II, B – I, C – III, D – IV
- 2. A – III, B – IV , C – II, D – I**
3. A – III, B – II, C – IV, D – I
4. A – IV, B – I, C – II, D - III

50. In case of okra or bhindi (*Abemoschus esculentus*) seeds, the minimum per cent pure seeds for certification is:

- 1. 99**
2. 98
3. 97
4. 96

51. Plant pathogens can be detected and identified using ELISA and PCR

- A. ELISA based detection is more useful for viral pathogen detection than bacterial pathogens
- B. Fungal diseases are more amenable for ELISA based detection than plant viruses
- C. Bacterial pathogens are more amenable for PCR based detection than plant viruses

D. Bacterial pathogens are more amenable for PCR based detection than fungal pathogens

E. Phytoplasma is more amenable for PCR based detection than ELISA

Choose the most appropriate answer from the option given below:

1. B and C only

2. D and E only

3. B and D only

4. A and E only

52. Match List I with List II

List I	List II
Objectionable weed	Crop
A. Argemone maxicana	I. Lucerne
B. Johnson grass	II. Rapessed and mustard
C. Cichorium inotybus	III. Sorghum
D. Phalaris minor	IV. Wheat

Choose the correct answer from the options given below:

1. A – II, B – III, C – IV, D – I

2. A – II, B – III, C – I, D – IV

3. A – II, B – I, C – III, D – IV

4. A – IV, B- III, C – I, D – II

53. Cis – trans or complementation test results maybe ambiguous, if –

A. The mutations are dominant

B. There is intragenic complementation

C. The mutations belong to different genes with different phenotype

D. There is polar mutation

E. There is gene interaction

Choose the correct answer from the options given below

1. A – B – C – D

2. B – C – D – E

3. A – B – C – E

4. A – C – D - E

54. On average, how many fragments would a restriction enzyme, which recognizes a specific 5 base sequence in the DNA, would produce from a double-stranded bacteriophage genome of size 5252 bp?

1. About 3

2. About 5

3. About 7

4. About 9

55. In genetic analysis, the effect of tight-linkage may create confusion with of the following events?
1. Pseudoallele
 - 2. Pleotropy**
 3. Penetrance
 4. Epistasis

56. Match List I with List II

List I	List II
A. ICRISAT	I. London
B. Kew Botanical Garden	II. Chennai
C. National Biodiversity Authority	III. New Delhi
D. Protection of Plant varieties and Farmers' Right Authority	IV. Patencheru

Choose the correct answer from the options given below:

- 1. A – IV B – I, C – II, D – III**
2. A – III, B – IV, C – II, D – I
3. A – I, B – II, C – III, D – IV
4. A – IV, B – III, C – II, D – I

57. Given below are two statements

Statement I: The light-dependent reactions occur in the stroma in presence of light.

Statement II : The light-independent reaction occurs in the thylakoid in the absence of light

In light of the above statement, choose the most appropriate answer from the options given below.

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

58. Single cross hybrids can be used for a variety of purposes such as -

- A. Development of three-way cross hybrid.
- B. Development of composite variety.
- C. Development of double cross hybrid.
- D. Prediction of double cross hybrid.
- E. Back cross generation.

Choose the correct answer from the options given below:

1. A, B, D and E only
2. A, B, and C only
- 3. A, C, and D only**
4. A, B, C and D only

59. Given below are two statements
Statement I: Pre – 1940, genes were considered to be like ‘beads- on string and ‘not – divisible’.
Statement II: In 1940, CP Oliver proved that the genes are divisible.
In light of the above statements, choose the most appropriate answer from the options given below
- 1. Both Statement I and Statement II are correct**
2. Both Statement I and Statement II are incorrect
3. Statement I is correct but Statement II is incorrect
4. Statement I is incorrect but Statement II is correct.
60. The gas used in gas delinting of cotton seeds is –
1. Dry CO₂
2. Nitric oxide
3. Sulphur di-oxide
4. Dry hydrochloric acid
61. Match List I and List II
- | List I | List II |
|----------------------|-------------------|
| A. Sesbania rostrata | I. Azotobacter |
| B. Vermi-composting | II. Anabaena |
| C. Heterocyst | III. Green manure |
| D. Cyst | IV. Earthworm |
- Choose the correct answer from the options given below :
1. A - III, B – IV, C – I, D – II
2. A – IV, B – II, C – I, D – III
3. A – III, B – II, C – IV, D – I
4. A – III, B – IV, C – II, D – I
62. The electrical conductivity (EC) test in seed testing gives a clear indication of –
1. Dehydrogenase activity
2. Alpha-amylase activity
3. Integrity of cell membrane
4. Glutamic acid decarboxylase activity
63. Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R
Assertion A: In DUS trials, the number and nature of varieties largely determines the use of experimental design.
Reason R : Randomized Incomplete Block Design is the most used experimental design in DUS trials.
In light of the above statements, choose the most appropriate answer from the option given below

1. Both A and R are correct and R is the correct explanation of A
 2. Both A and R are correct but R is NOT the correct explanation of A
3. A is correct but R is not correct
 4. A is not correct but R is correct
64. Frequency of recombination between two genes is affected by –
 A. Coupling and repulsion phase of linkage
 B. Asynapsis and desynapsis
 C. Location of the gene with respect to the centromere
 D. Distance between two genes
 E. Translocation of the genes
- Choose the correct answer from the options given below:
1. A, B, C and D only
 2. A, C, D and E only
3. B, C, D and E only
 4. A, B, C and E only
65. Given below are two statements
 Statement I: Presence of objectionable weed seed reduces the physiological quality of a seed lot.
 Statement II: Seeds of objectionable weed have same shape and size as the main crop seeds.
1. Both Statement I and Statement II are true
 2. Both Statement I and Statement II are false
 3. Statement I is true but Statement II is false
4. Statement I is false but Statement II is true
66. Match List I with List II
- | List I | List II |
|---------------------------------------|--------------------------------------|
| A. Central Dogma of molecular biology | I. James Watson and FHC Crick |
| B. Chromosomal theory of inheritance | II. George W Beadle and Edward Tatum |
| C. DNA double helical structure | III. FHC Crick |
| D. One gene- one enzyme | IV. Walter Sutton and Theodor Boveri |
- Choose the correct answer from the options given below:
- 1. A – II, B – IV, C – I , D – III**
 2. A – III, B – II, C – I, D- IV
 3. A – II, B – III, C – IV, D – I
 4. A – I, B – II, C – III, D – IV
67. Which of the following are properties of Mollicutes
 A. Lack of defined cell wall

- B. Resistance to penicillin
- C. Pleomorphic shape
- D. Resistance to tetracycline
- E. Parasitism on eukaryotic organisms

Choose the most appropriate answer from the options given below:

- 1. A, B, C and D only
- 2. A, C, D and E only
- 3. A, B, C, D and E
- 4. A, B, C and E only**

68. Rot diseases are caused by

- 1. Fusarium oxysporum
- 2. Fusarium solani**
- 3. Ralstonia Solanacearum
- 4. Ralstonia Pseudosolanacearum

69. Development of seedless fruit would not be useful in case of -

- 1. Mango
- 2. Grape
- 3. Orange
- 4. Pomegranate**

70. Rust diseases are caused by

- A. Puccinia
- B. Albugo
- C. Cephalerous
- D. Uromyces
- E. Gymnosporangium

Choose the correct answer from the option given below

- 1. Puccinia causes rust only on wheat
- 2. Albugo causes rust on mustards**
- 3. Cephalerous causes rust on barley
- 4. Uromyces and Gymnosporangium causes rust on tomato

71. Given below are two statements

Statement I: Horizontal and Vertical Resistance defend crop plants against pathogens

Statement II. Horizontal Resistance is more frequently exploited in resistance breeding programme than Vertical Resistance

In light of the above statements, choose the most appropriate answer from the options given below

- 1. Both Statement I and Statement II are correct
- 2. Both Statement I and Statement II are Incorrect
- 3. Statement I is correct but Statement II is incorrect**

4. Statement I is Incorrect but Statement II is correct
72. Which of the following statements are true for Koch's postulates
- The microorganisms must be present in every case of the disease
 - The microorganisms may not be present in every case of the disease
 - The microorganisms must be isolated from the diseased host and grown in pure culture
 - The specific disease must be reproduced on inoculation of a pure culture of microorganisms in the healthy susceptible host.
 - The microorganisms must be recoverable once again from the inoculated susceptible host
- Choose the most appropriate answer from the options given below:
1. A, B, C and D only
 2. A, B, C D, E
 - 3. A, C, D, E only**
 4. C, D, E only
73. Light pathway of a typical microscope consists of several items, viz.
- Light source or Mirror
 - Field diaphragm to Condensor
 - Stage to Specimen
 - Objective to Body
 - Ocular to Eye. Camera
- Choose the correct answer from the options given below
1. Light path is A to C to B to D to E
 2. Light path is A to D to C to B to E
 - 3. Light path is A to B to C to D to E**
 4. Light path is A to E to C to B to D
74. Chronological steps in the development of hybrid
- Development of inbreds
 - Evaluation of the hybrid with check
 - Testing for combining ability
 - Morphological evaluation of inbreds
 - Seed multiplication
- Choose the correct answer from the options given below
1. A – C – D – B – E
 2. A – D – B – C – E
 - 3. A – D – C – B – E**
 4. D – A – C – B – A
- Given below are two statements
- Statement I: Plant viruses are transmitted in insects

Statement II. Only sucking insects are capable of transmitting plant viruses

In light of the above statements, choose the most appropriate answer from the options given below

1. Both Statement I and Statement II are correct
2. Both Statement I and Statement II are incorrect
- 3. Statement I is correct but Statement II is incorrect**
4. Statement I is Incorrect but Statement II is correct

76.

Given below are two statements

Statement I: Plastids are site of purine synthesis

Statement II. Cytosol is the site of pyrimidine synthesis

In light of the above statements, choose the most appropriate answer from the options given below

- 1. Both Statement I and Statement II are true**
2. Both Statement I and Statement II are false
3. Statement I is correct but Statement II is false
4. Statement I is Incorrect but Statement II is true

77.

Match List I with List II

List I	List II
Name of international Institute	Major mandate crop
A. ICRISAT	I. Wheat
B. IITA	II. Pigeonpea
C. CIAT	III. Cassava
D. CIMMYT	IV. Cowpea

Choose the correct answer from the options given below:

1. A – II, B – IV, C – I , D – III
- 2. A – II, B – IV, C – III, D- I**
3. A – II, B – III, C – IV, D – I
4. A – I, B – II, C – III, D – IV

78.

Which of the following can be used for surface sterilization of plant material

1. Sodium chloride
2. Sodium hydroxide
3. Sodium sulphate
- 4. Sodium hypochlorite**

79.

Color of the seed tag used in Foundation seed is-

1. Azure Blue
- 2. White**
3. Golden yellow
4. Red

80. Given below are two statements
Statement I: True fungi is typically terrestrial-adapted organisms.
Statement II. True fungi possess chitin in the cell wall.
In light of the above statements, choose the most appropriate answer from the options given below
- 1. Both Statement I and Statement II are correct**
2. Both Statement I and Statement II are incorrect
3. Statement I is correct but Statement II is incorrect
4. Statement I is Incorrect but Statement II is correct
81. Which of the following plant disease was responsible for environmental disturbances impacting even the wildlife
1. Late blight of potato
2. Chestnut blight
3. Downy mildew of grapevine
4. Southern Corn blight
82. Heterosis cannot be fixed, if it is obtained through-
A. Apomixis
B. Balanced lethal system
C. Development of F_1 hybrid
D. Development of synthetic variety
E. Vegetative propagation
Choose the correct answer from the options given below:
1. C, D and E only
2. B, C and D only
3. B and D only
4. C and D only
83. Ideal C : N ratio of the mature compost is
1. < 20 : 1
2. 35 : 1
3. 60 : 1
4. 100 : 1
84. Given below are two statements
Statement I: National Agriculturally Important Microbial Culture Collection (NAIMCC) is located in Mau Nath Bhanjan, Uttar Pradesh
Statement II. NAIMCC has acquired the status of International Depository Authority under Budapest treaty in 2020
In light of the above statements, choose the most appropriate answer from the options given below
- 1. Both Statement I and Statement II are correct**
2. Both Statement I and Statement II are incorrect

3. Statement I is correct but Statement II is incorrect
4. Statement I is Incorrect but Statement II is correct
85. Which of the following are NOT chain initiation codons
A. UAA
B. UAG
C. UGA
D. AUG
E. GUG

Choose the correct answer from the options given below:

1. A, B and D only
 2. B, C and E only
 - 3. A, B and C only**
 4. D and E only
86. Given below are two statements

Statement I: Growth regulators which control plant growth and development are called phytohormones.

Statement II. Apical meristems are responsible for growth in length of branches and roots.

In light of the above statements, choose the most appropriate answer from the options given below

- 1. Both Statement I and Statement II are true**
 2. Both Statement I and Statement II are false
 3. Statement I is true but Statement II false
 4. Statement I is false but Statement II is true
87. In a population of 100 individual, which is in Hardy-Weinberg, equilibrium, the number of individual of different phenotypic classes are follows: 64 AA, 32 Aa, 4 aa. The frequency of A and a in this population would be-
1. A = 0.64, a = 0.36
 2. A = 0.60, a = 0.40
 - 3. A = 0.80, a = 0.20**
 4. A = 0.30, a = 0.70

88. Given below are two statements, one is labelled as Assertion A and the Other is labelled as Reasons R.

Assertion A: Soils of North-East India are primarily acidic in nature

Reason R: Among others the most common element in the soils of North-East India is 'Ca', which contributes towards acidity of the soils.\

In light of the above statements, choose the most appropriate answer from the options given below

1. Both A and R are true R is the correct explanation of A
 2. Both A and R are true but R is NOT the correct explanation of A
3. A is true but R is false
 4. A is not false but R is true
89. Given below are two statements, one is labelled as Assertion A and the Other is labelled as Reasons R.
 Assertion A: Flag leaf clipping in hybrid seed production in rice promotes higher seed setting
 Reason R: Flag leaf of rice intercepts more sunlight and facilitates accumulation of more photo-synthates in the seeds as it is nearer to the panicle.
 In light of the above statements, choose the most appropriate answer from the options given below
 1. Both A and R are true and R is the correct explanation of A
2. Both A and R are true but R is NOT the correct explanation of A
 3. A is true but R is not correct
 4. A is not correct but R is true
90. The horn development in sheep (horned sheep) is a suitable example of which of the following events?
 1. Sex limited trait
2. Sex influenced trait
 3. Sex linked trait
 4. Holandric trait
91. Given below are two statements, one is labelled as Assertion A and the Other is labelled as Reasons R.
 Assertion A: Brassica juncea is an allotetraploid having AABB genome
 Reason R: Brassica juncea is produced when B nigra is crossed to B campestris
 In light of the above statements, choose the most appropriate answer from the options given below
1. Both A and R are true and R is the correct explanation of A
 2. Both A and R are true but R is NOT the correct explanation of A
 3. A is true but R is not correct
 4. A is not correct but R is true
92. Match List I with List II
- | List I | List II |
|-------------------|---|
| Name of Scientist | Significant contribution in major field |
| A. Hugo de Vries | I. Coined the term mitosis |
| B. W Flemming | II. Semi-conservative mode of DNA |

	replication
C. C Stern	III. Mutation
D. MS Meseleson and FW stahl	IV. Cytological basis of crossing over in Drosophila

Choose the correct answer from the options given below:

1. A – III, B – I, C – II, D – IV
2. A – II, B – I, C – III, D – IV
- 3. A – III, B – I, C – IV, D – II**
4. A – III, B – II, C – I, D – IV

93. Given below are two statements

Statement I: Nitrification is the biological oxidation of ammonia to nitrates, in two steps

Statement II. Members of genus Nitrobacter are involved in the oxidation of nitrites tonitrates

In light of the above statements, choose the most appropriate answer from the options given below

1. Both Statement I and Statement II are correct

2. Both Statement I and Statement II are incorrect
3. Statement I is correct but Statement II incorrect
4. Statement I is incorrect but Statement II is correct

94. The Ramsar Convention is an international treaty for the conservation and utilization of

1. Dry land
- 2. Wet land**
3. Rainforest
4. Desert

95. Match List I with List II

List I	List II
A. National Bureau of Plant Genetic Resource (NBPGR)	I. Karnal
B. National Bureau of Animal Genetic Resource (NBAGR)	II. Lucknow
C. National Bureau of Fish Genetic Resource (NBAGR)	III. Delhi
D. National Bureau of soil survey and Land use Planning (NBSSLUP)	IV. Nagpur

Choose the correct answer from the options given below:

1. A – III, B – II, C – I, D – IV
2. A – IV, B – I, C – II, D – III

3. A - IV, B - II, C - I, D - III
4. A - III, B - I, C - II, D - III

96. Given below are two statements

Statement I: Operon models of gene regulation are applicable prokaryotes only

Statement II. Eukaryotic DNA contain intervening pieces of DNA called Introns

In light of the above statements, choose the most appropriate answer from the options given below

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

97. A tall greengam plant was crossed with a dwarf plant. All the F_1 plants were of intermediate height. The F_2 plants produced different phenotypic classes (Plant height) in the ratio of 1 : 4 : 6 : 4 : 1. How many genes are involved in controlling the plant height?

1. 1
- 2. 2**
3. 3
4. 4

98. Which of the following require oxygen for aerobic respiration but can also grow under anaerobic conditions?

1. Strict anaerobic bacteria
- 2. Micro-aerophilic bacteria**
3. Facultative anaerobic bacteria
4. Aerobic bacteria

99. Which of the following cell organelle does not contain DNA

- 1. Lysosome**
2. Mitochondria
3. Chloroplast
4. Nucleus

100. Which of the following is a form of ex-situ conservation

- A. Gene banks
- B. Tissue culture repositories
- C. National parks
- D. Biosphere reserves
- E. Botanical gardens

Choose the most appropriate answer from the options given below:

- 1. A, B and E only**

2. B, D and E only
 3. C, D and E only
 4. A, B and C only
101. Given below are two statements
 Statement I: Viruses are the only pathogens transmitted by nematodes
 Statement II. Biotic agents associated with plants are known to transmit plant pathogens
 In light of the above statements, choose the most appropriate answer from the options given below
 1. Both Statement I and Statement II are correct
 2. Both Statement I and Statement II are incorrect
 3. Statement I is correct but Statement II incorrect
4. Statement I is incorrect but Statement II correct
102. Match List I with List II
- | List I | List II |
|-------------------|---|
| A.
Protogyny | I. Differential maturation of male and female flowers |
| B.
Androgyny | II. Stamen matures before pistil |
| C.
Dichogamy | III. Pistil matures before stamen |
| D.
Cleistogamy | IV. Flower does not open |
- Choose the correct answer from the options given below:
1. A – I B – II, C – IV, D, - II
 - 2. A – III, B – II, C – I, D – IV**
 3. A- II, B – I, C – III, D – IV
 4. A – II, B – III, C – IV, D – I
103. Which of the following molecule is known as the energy currency of the cell
1. ATP
 2. AMP
 3. NADH
 4. FADH₂
104. Given below are two statements, one is labelled as Assertion A and the Other is labelled as Reasons R.
 Assertion A: Barley is an alternate host for *Puccinia graminis* f. sp. *tritici*
 Reason R: Barley plays a key role in rust epidemics in India

In light of the above statements, choose the most appropriate answer from the options given below

1. Both A and R are true and R is the correct explanation of A
2. Both A and R are true but R is NOT the correct explanation of A
- 3. A is true but R is false**
4. A is false but R is true

105. Given below are two statements, one is labelled as Assertion A and the Other is labelled as Reasons R.

Assertion A: Rotation with legume crops can increase the nitrogen levels in the soil thus improving the soil fertility

Reason R: Legume crops harbor nitrogen fixing bacteria in the root nodules that can convert inert nitrogen from the atmosphere to plant usable form

In light of the above statements, choose the most appropriate answer from the options given below

- 1. Both A and R are true and R is the correct explanation of A**
2. Both A and R are true but R is NOT the correct explanation of A
3. A is true but R is not correct
4. A is not correct but R is true

106. Members of which of the nitrogen fixing genera form symbiotic associations with aquatic fern Azolla

1. Nostoc
- 2. Anabaena**
3. Azotobacter
4. Calothrix

107. The most common secondary structure of protein molecule is –

1. Beta helix
2. Gramma helix
- 3. Alpha helix**
4. Delta helix

108. Wilt diseases are caused by

1. Heat
2. Drought
- 3. Bacteria and Fungi**
4. Viroids

109. Match List I with List II

List I	List II
A. Anton de Bary	I. Gene for Gene hypothesis
B. M. W. Beijerinck	II. Late blight of potato
C. T. J. Burril	III. Bacterial disease of plants

D. E. J. Bulter	IV. Viruses
E. H. J. Flora	V. Imperial Mycologist

Choose the correct answer from the options given below:

1. A – III, B – IV, C – II, D – V, E – I
- 2. A – II, B – IV, C – III, D – V E – I**
3. A – III, B – V, C – II, D – IV, E – I
4. A – II, B – V, C – I, D – IV, E – III

110. The acronym ITPGRFA stands for

1. International Trade on Plant Genetic Resources for Food and Agriculture
- 2. International Treaty on Plant Genetic Resources for Food and Agriculture**
3. International Trade on Plant Genomic Resources for Food and Agriculture
4. International Treaty on Plant Genomic Resources for Food and Agriculture

111. If a woman carier for color blindness maries to a color blind man and produce several children, the expected phenotype (color blind or normal) of the offspring would be-

1. All the offspring will be color blind
2. All male offspring will be color blind and all females will be normal
3. All male offspring will be normal and female will be color blind
- 4. All female offspring will be carriers of colors blindness or color blind**

112. Match List I with List II

List I	List II
A. ITCC	I. Belgium
B. MTCC	II. England
C. NCPPB	III. New Delhi
D. ATCC	IV. Chandigarh
E. LMG	V. USA

Choose the correct answer from the options given below:

- 1. A – III, B – IV, C – II, D- V, E – I**
2. A – II, B – IV , C – III, D – V, E – I
3. A – III, B – V, C – II, D – IV, E – I
4. A – II, B – V, C – I, D – IV, E – III

113. Match List I with List II

List I	List II
Crop	Isolation distance (m) in certified

	seeds
A. Wheat	I. 1000
B. Composite variety of maize	II. 100
C. Radish	III. 3
D. Pigeonpea	IV. 200

Choose the correct answer from the options given below:

1. A – III, B – IV, C – II, D – I
- 2. A – III, B- IV, C – I, D- II**
3. A – III, B –II, C – IV, D - I
4. A – II, B – I, C – IV, D –II

114. In Q- banding experiments, the light fluorescent band indicates that the chromosomal region is rich in base pairs –

1. T only
2. A only
3. A and T
- 4. G and C**

115. Which of the following is fiber yielding plant

1. Triticum aestivum
- 2. Gossypium hirsutum**
3. Lens culinaris
4. Glycine max

116. The concept of chromosomal non – disjunction was given by-

1. T. H. Morgan
2. A. H. Sturtevant
3. H. E. Muller
- 4. C. B. Bridges**

117. Match List I with List II

List I	List II
Particular item	Description
A. Arboratum	I. Bio-geographic region with higher biodiversity
B. Herbarium	II. Sum total of genes of a species
C. Biodiversity hotspot	III. Botanical garden with trees and shrubs
D. Germplasm	IV. Collection of dried leaf specimen

Choose the correct answer from the options given below:

- 1. A – III, B – IV, C – I, D – II**
2. A – III, B – IV, C – II, D – I

3. A – III, B – I, C – II, D – IV

4. A – IV, B – III, C – I, D – II

118. Match List I with List II

List I	List II
Sex index	Sexual phenotype
A. 1.0	I. Male
B. 0.5	II. Intersex
C. 0.67	III. Super male
D. 0.33	IV. Female

Choose the correct answer from the options given below:

1. A – IV, B – I, C – II, D- III

2. A – IV, B – I, C – III, D – II

3. A –IV, B – III, C – I, D – II

4. A – I, B- IV, C – II, D – III

119 Given below are two statements

Statement I: National Bureau of Animal Genetic Resources is located at Karnal.

Statement II. National Bureau of Fish Genetic Resources is located at Chennai

In light of the above statements, choose the most appropriate answer from the options given below

1. Both Statement I and Statement II are true

2. Both Statement I and Statement II are false

3. Statement I is true but Statement II false

4. Statement I is false but Statement II true

120. Match List I with List II

List I	List II
A. Zeatin	I. Auxin
B. Picloram	II. Amino acid
C. Thiamine	III. Cytokinin
D. Glutamine	IV. Vitamin

Choose the correct answer from the options given below:

1. A – I, B – III, C – IV, D – II

2. A – III, B – I, C – IV, D – II

3. A – II, B – I, C – III, D – IV

4. A – III, B- II, C – IV, D – I

119. Match List I with List |

List 1	List 2
A Microsclerotia	I Clarence P Oliver
B Macrophomina phaseolina	ii Schleiden, Schwann, and inheritance Virchow
C Bipolaris sorokiniana	iii Vernon Ingram
D Ralstonia solanacearum	iv Walter Sutton and Theodor

Choose the correct answer from the options given below:

- (A) A (I), B (I), C (U), D (IV)
- (B) A (IV), B (I), C (III), D
- (C) A (II), B (I), C (II), D (IV)**
- (D) A (1), B (I), C (III), D (IV)

120. The possible number of 'triplet' codons from 6 different types of nucleotides in the DNA molecule is:

- (A) $(6)^3$**
- (B) $(3)^{63}$
- (C) $(6)^6$
- (D) $(3)^3$