

# National Testing Agency

<b>Question Paper Name :</b>	Genetics and Plant Breeding 17th September Shift 2
<b>Subject Name :</b>	Genetics and Plant Breeding
<b>Creation Date :</b>	2021-09-17 18:54:17
<b>Duration :</b>	120
<b>Total Marks :</b>	480
<b>Display Marks:</b>	Yes

## Genetics and Plant Breeding

<b>Group Number :</b>	1
<b>Group Id :</b>	19088975
<b>Group Maximum Duration :</b>	0
<b>Group Minimum Duration :</b>	120
<b>Show Attended Group? :</b>	No
<b>Edit Attended Group? :</b>	No
<b>Break time :</b>	0
<b>Group Marks :</b>	480
<b>Is this Group for Examiner? :</b>	No

## Part A: General Knowledge

<b>Section Id :</b>	190889149
<b>Section Number :</b>	1
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory



<b>Number of Questions :</b>	20
<b>Number of Questions to be attempted :</b>	20
<b>Section Marks :</b>	80
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	190889189
<b>Question Shuffling Allowed :</b>	Yes

**Question Number : 1 Question Id : 1908898302 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

Which of the following is the device used to measure the power and speed of the wind?

1. Avometer
2. Anemometer
3. Airometer
4. Aviontimeter

**Options :**

- 19088933101. 1
- 19088933102. 2
- 19088933103. 3
- 19088933104. 4

**Question Number : 2 Question Id : 1908898303 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1**

Optical fibre used the concept of which of the following?

1. Reflection
2. Refraction
3. Total internal reflection
4. Total internal refraction



**Options :**

- 19088933105. 1
- 19088933106. 2
- 19088933107. 3
- 19088933108. 4

**Question Number : 3 Question Id : 1908898304 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Yellow vein mosaic is the viral disease of which of the following plants?

- 1. Ladyfinger
- 2. Papaya
- 3. Sugarcane
- 4. Banana

**Options :**

- 19088933109. 1
- 19088933110. 2
- 19088933111. 3
- 19088933112. 4

**Question Number : 4 Question Id : 1908898305 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following organ(s) is affected by Mumps disease?

- 1. Entire body
- 2. Skin
- 3. Eye
- 4. Parotid

**Options :**

- 19088933113. 1
- 19088933114. 2
- 19088933115. 3



19088933116.4

**Question Number : 5 Question Id : 1908898306 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following is the chemical name of vitamin B<sub>2</sub>?

1. Riboflavin
2. Calciferol
3. Pyridoxin
4. Niacin

**Options :**

19088933117.1

19088933118.2

19088933119.3

19088933120.4

**Question Number : 6 Question Id : 1908898307 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following is not the input unit of the computer?

1. Mouse
2. Keyboard
3. Screen
4. Scanner

**Options :**

19088933121.1

19088933122.2

19088933123.3

19088933124.4

**Question Number : 7 Question Id : 1908898308 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**



**Correct Marks : 4 Wrong Marks : 1**

The digital computer operates on which of the following principle?

1. Measurement
2. Calculation
3. Logical
4. Electrification

**Options :**

19088933125. 1

19088933126. 2

19088933127. 3

19088933128. 4

**Question Number : 8 Question Id : 1908898309 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The non-cooperation movement of Gandhiji was launched in which of the following year?

1. 1915
2. 1922
3. 1920
4. 1930

**Options :**

19088933129. 1

19088933130. 2

19088933131. 3

19088933132. 4

**Question Number : 9 Question Id : 1908898310 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



An Islamic revivalist movement named Wahabi movement was founded by which of the following person?

1. Sian Saheb
2. Syed Ahmed
3. Haji Shariat-Allah
4. DaduMian

**Options :**

19088933133. 1

19088933134. 2

19088933135. 3

19088933136. 4

**Question Number : 10 Question Id : 1908898311 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following is considered as the “Magna Carta of England Education in India”?

1. Hunter education commission
2. Lord Macaulay’s Minute
3. Wood’s Despatch
4. Thomas Babington Macaulay

**Options :**

19088933137. 1

19088933138. 2

19088933139. 3

19088933140. 4

**Question Number : 11 Question Id : 1908898312 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Which of the following nutrient does not come under the ambit of 'macro-nutrients in Soil Health Card?

1. Nitrogen
2. Zinc
3. Phosphorous
4. Potassium

**Options :**

19088933141. 1

19088933142. 2

19088933143. 3

19088933144. 4

**Question Number : 12 Question Id : 1908898313 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Cole crops, root crops and legumes come under the ambit of which of the following?

1. Olericulture
2. Pomology
3. Viticulture
4. Arboriculture

**Options :**

19088933145. 1

19088933146. 2

19088933147. 3

19088933148. 4

**Question Number : 13 Question Id : 1908898314 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



The study of individual trees, shrubs, vines, and perennial woody plants is known as which of the following?

1. Turf management
2. Arboriculture
3. Pomology
4. Viticulture

**Options :**

19088933149. 1

19088933150. 2

19088933151. 3

19088933152. 4

**Question Number : 14 Question Id : 1908898315 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The ministry is implementing MIDH (Mission for Integrated Development of Horticulture) with effect from which of the following year?

1. 2012-13
2. 2019-20
3. 2015-16
4. 2014-15

**Options :**

19088933153. 1

19088933154. 2

19088933155. 3

19088933156. 4

**Question Number : 15 Question Id : 1908898316 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



The interaction of soils with living things, particularly plants are well known as which of the following?

1. Edaphology
2. Pedology
3. Soil zoology
4. Pedogenesis

**Options :**

19088933157. 1

19088933158. 2

19088933159. 3

19088933160. 4

**Question Number : 16 Question Id : 1908898317 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following systems has also incorporated social aspects in itself?

1. Landscaping
2. Permaculture
3. Horticulture
4. Forest gardening

**Options :**

19088933161. 1

19088933162. 2

19088933163. 3

19088933164. 4

**Question Number : 17 Question Id : 1908898318 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



What do you term the phenomenon whereby the specific gene is added to the plant for producing a desirable phenotype?

1. Genetic manipulation
2. Genetic recombination
3. Genetic modification
4. Genetic hybridisation

**Options :**

19088933165. 1

19088933166. 2

19088933167. 3

19088933168. 4

**Question Number : 18 Question Id : 1908898319 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

What is the focus of the participatory plant breeding program?

1. Scientists
2. Plants
3. Environment
4. Farmers

**Options :**

19088933169. 1

19088933170. 2

19088933171. 3

19088933172. 4

**Question Number : 19 Question Id : 1908898320 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



How do you term the form of agriculture, in which, industrialized production of crops and animal products takes place?

1. Manufactured agriculture
2. Modern agriculture
3. Industrial agriculture
4. Mechanistic agriculture

**Options :**

19088933173. 1

19088933174. 2

19088933175. 3

19088933176. 4

**Question Number : 20 Question Id : 1908898321 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Micro-irrigation fund of Rs. 5.000 crore has been placed with which of the following organization?

1. NABARD
2. IDBI
3. SBI
4. RRBs

**Options :**

19088933177. 1

19088933178. 2

19088933179. 3

19088933180. 4

## Part B Core : Crop Sciences-I

**Section Id :**

**Section Number :**

**Section type :**



190889150

2

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<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	50
<b>Number of Questions to be attempted :</b>	50
<b>Section Marks :</b>	200
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	190889190
<b>Question Shuffling Allowed :</b>	Yes

**Question Number : 21 Question Id : 1908898322 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

In one of the following plant, pollination generally occurs after the flower open, but the position of anthers in relation to stigmas ensures self-pollination.

1. Alfalfa
2. Tomato
3. Pigeonpea
4. Sunflower

**Options :**

19088933181. 1

19088933182. 2

19088933183. 3

19088933184. 4

**Question Number : 22 Question Id : 1908898323 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



In Pigeonpea the hybrid GTH-1 was released using the A<sub>2</sub> cytoplasm. Name the species from where this A<sub>2</sub> cytoplasm was derived

1. *Cajanus cajanifolium*
2. *Cajanus scaraboides*
3. *Cajanus sericeus*
4. *Cajanus acutifolius*

**Options :**

19088933185. 1

19088933186. 2

19088933187. 3

19088933188. 4

**Question Number : 23 Question Id : 1908898324 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Out of the two methods for multicolour FISH, the direct method uses one of the following as reporter molecules. Choose the molecule.

1. Biotin
2. Digoxigenin
3. Dinitrophenol
4. Fluorochromes

**Options :**

19088933189. 1

19088933190. 2

19088933191. 3

19088933192. 4

**Question Number : 24 Question Id : 1908898325 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



If the garden pea has 14 chromosomes in its diploid complement, how many double trisomies could theoretically exist

1. 6
2. 9
3. 16
4. 21

**Options :**

19088933193. 1

19088933194. 2

19088933195. 3

19088933196. 4

**Question Number : 25 Question Id : 1908898326 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Out of the four statements given below , which of the statements are true

- A. Mass selection is the best method for improving metric traits with low heritabilities
- B. Matings between siblings are the most extreme form of inbreeding possible among sexually reproducing species
- C. Line breeding is a special form of inbreeding used to maintain a high genetic relationship to a desired ancestor
- D. Loss of vigor (vegetative and/or reproductive) commonly accompanies an increase in polygenic homozygosity

1. A and B only
2. B and C only
3. A and D only
4. C and D only

**Options :**

19088933197. 1

19088933198. 2

19088933199. 3

19088933200. 4



**Question Number : 26 Question Id : 1908898327 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Structural and functional rearrangements of chromatin are mediated by the modification of histone tails. These rearrangements include following process and one of the given process is not related to chromatin remodeling. Find the odd one.

1. Acetylation
2. Ubiquitinylation
3. Phosphorylation
4. Translation

**Options :**

19088933201. 1

19088933202. 2

19088933203. 3

19088933204. 4

**Question Number : 27 Question Id : 1908898328 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

A form of clonal reproduction in species hybrids whose gametes carry only the nuclear genome derived from one of the parental species

1. Hybridoma
2. Hybrid dysgenesis
3. Hybridogenesis
4. Hybrid swarm

**Options :**

19088933205. 1

19088933206. 2

19088933207. 3

19088933208. 4

**Question Number : 28 Question Id : 1908898329 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**



**Correct Marks : 4 Wrong Marks : 1**

Match the Brassica species with its chromosome number (n)

List I	List II
A. <i>Brassica napus</i>	I. $n = 18$
B. <i>Brassica juncea</i>	II. $n = 19$
C. <i>Brassica rapa</i>	III. $n = 8$
D. <i>Brassica nigra</i>	IV. $n=10$

Choose the *correct* answer from the options given below:

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

**Options :**

19088933209. 1

19088933210. 2

19088933211. 3

19088933212. 4

**Question Number : 29 Question Id : 1908898330 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Suppose that in bees the dominant gene  $b^+$  produces wild-type (brown) eyes, and its recessive allele  $b$  produces pink eye color. If a pink-eyed queen mates with a brown-eyed drone, their offspring would most likely be in one of the following pattern of segregation. Choose the correct pattern of segregation.

1. only wild-type progeny
2. wild-type workers and pink-eyed drones
3. only pink-eyed progeny
4. workers =  $\frac{1}{2}$  wild :  $\frac{1}{2}$  pink-eye; all drones wild type

**Options :**

19088933213. 1

19088933214. 2

19088933215. 3

19088933216. 4



**Question Number : 30 Question Id : 1908898331 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

In humans, the genes that are present on the X-chromosome show what kind of transmission from one to another generation?

1. Zig-zag transmission
2. Criss-cross transmission
3. Anti-parallel transmission
4. Direct transmission

**Options :**

19088933217. 1

19088933218. 2

19088933219. 3

19088933220. 4

**Question Number : 31 Question Id : 1908898332 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements

**Statement I:** Sex-influenced traits show higher penetrance in one sex.

**Statement II:** Sex-limited traits show zero penetrance in other sex.

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

**Options :**

19088933221. 1

19088933222. 2

19088933223. 3

19088933224. 4



**Question Number : 32 Question Id : 1908898333 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following is/are sequencing-based marker(s)?

- A. Restriction Fragment Length Polymorphism (RFLP)
- B. Expressed Sequence Tags (ESTs)
- C. Diversity Array technologies (DArTs)
- D. Amplified Fragment Length Polymorphism (AFLP)

Choose the *correct* answer from the options given below:

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

**Options :**

19088933225. 1

19088933226. 2

19088933227. 3

19088933228. 4

**Question Number : 33 Question Id : 1908898334 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The undesirable effect caused due to the presence of a large chunk of donor chromosome even after many backcrosses is known as?

- 1. Association
- 2. Linkage equilibrium
- 3. Linkage disequilibrium
- 4. Linkage drag

**Options :**

19088933229. 1



19088933230. 2

19088933231. 3

19088933232. 4

**Question Number : 34 Question Id : 1908898335 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Biofortification of crops means?

- A. Enrichment of crop edible portion for major nutrients.
- B. Enrichment of crop edible portion for some micronutrients.
- C. Inclusion of herbicide tolerance in the crops.
- D. Inclusion of insecticide tolerance in the crops.

Choose the *correct* answer from the options given below:

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

**Options :**

19088933233. 1

19088933234. 2

19088933235. 3

19088933236. 4

**Question Number : 35 Question Id : 1908898336 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Which cell organelle plays an important role in cell wall formation?

- A. Golgi bodies
- B. Endoplasmic reticulum
- C. Lysosome
- D. Ribosome

Choose the *correct* answer from the options given below:

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

**Options :**

19088933237. 1

19088933238. 2

19088933239. 3

19088933240. 4

**Question Number : 36 Question Id : 1908898337 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Methylation in the genome can be identified by?

- A. Bisulphite sequencing
- B. Monosulphite sequencing
- C. Dideoxy sequencing
- D. Deoxy sequencing

Choose the *correct* answer from the options given below:

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

**Options :**



19088933241. 1

19088933242. 2

19088933243. 3

19088933244. 4

**Question Number : 37 Question Id : 1908898338 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

In the process of genomic DNA isolation from the plant cell/tissue, the DNA is generally precipitated by adding?

1. Alkali
2. Alcohol
3. Acid
4. Phosphate buffer

**Options :**

19088933245. 1

19088933246. 2

19088933247. 3

19088933248. 4

**Question Number : 38 Question Id : 1908898339 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Functional genomics can be studied through?

- A. Subtracted cDNA Libraries
- B. Whole-genome sequencing
- C. cDNA Microarrays
- D. RNA Seq

Choose the *correct* answer from the options given below:

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

**Options :**

19088933249. 1

19088933250. 2

19088933251. 3

19088933252. 4

**Question Number : 39 Question Id : 1908898340 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Working sample size for the conduct of tetrazolium test in onion is

- 1. 25 seeds
- 2. 60 seeds
- 3. 100 seeds
- 4. 400 seeds

**Options :**

19088933253. 1

19088933254. 2

19088933255. 3

19088933256. 4



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**Question Number : 40 Question Id : 1908898341 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

In case of coated seeds, the components of purity analysis are

- A. Pure pellets
- B. Unpelleted seed
- C. Other seed pellet
- D. Inert matter

Choose the *correct* answer from the options given below:

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

**Options :**

19088933257. 1

19088933258. 2

19088933259. 3

19088933260. 4

**Question Number : 41 Question Id : 1908898342 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Genetic male sterility (GMS) is exploited during hybrid seed production of

- 1. Chrysanthemum
- 2. Petunia
- 3. Ornamental sunflower
- 4. Snapdragon

**Options :**

19088933261. 1

19088933262. 2

19088933263. 3

19088933264. 4



Question Number : 42 Question Id : 1908898343 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Aeroponics technology is exploited in seed production of

1. Alfalfa
2. Potato
3. Aster
4. Phlox

Options :

19088933265. 1

19088933266. 2

19088933267. 3

19088933268. 4

Question Number : 43 Question Id : 1908898344 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Aril is the edible part of the seed in

- A. Litchi
- B. Nutmeg
- C. Durian
- D. Hazelnut
- E. Cocoa

Choose the *correct* answer from the options given below:

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

Options :

19088933269. 1



19088933270. 2

19088933271. 3

19088933272. 4

**Question Number : 44 Question Id : 1908898345 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The planting ratio of female and male parent followed during single cross hybrid seed production of pearl millet is

1. 1:1
2. 3:2
3. 6:2
4. 2:1

**Options :**

19088933273. 1

19088933274. 2

19088933275. 3

19088933276. 4

**Question Number : 45 Question Id : 1908898346 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

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

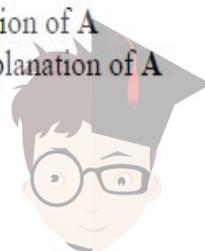
**Assertion A :** Complete seed processing procedural improves the seed health condition of the seed.

**Reason R :** Seeds are treated and dried (if necessary) before bagging.

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

**Options :**



19088933277. 1

19088933278. 2

19088933279. 3

19088933280. 4

**Question Number : 46 Question Id : 1908898347 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Match **List I** with **List II**

List I	List II
Vigour test	Crop
A. Cool germination test	I. Cotton
B. Cold test	II. Maize
C. Electrical conductivity test	III. Soybean
D. Controlled deterioration test	IV. Mustard

Choose the **correct** answer from the options given below:

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

**Options :**

19088933281. 1

19088933282. 2

19088933283. 3

19088933284. 4

**Question Number : 47 Question Id : 1908898348 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



The "Seedling Symptomatology Test" to observe for *Fusarium* infection in cereal crops was developed by \_\_\_\_\_?

1. NA Cobb
2. Perry
3. Hiltner
4. SB Mathur

**Options :**

19088933285. 1

19088933286. 2

19088933287. 3

19088933288. 4

**Question Number : 48 Question Id : 1908898349 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following is both externally and internally seed-borne pathogen?

1. *Ustilago nuda*
2. *Sclerospora graminicola*
3. *Tilletia indica*
4. *Neovossia horrida*

**Options :**

19088933289. 1

19088933290. 2

19088933291. 3

19088933292. 4

**Question Number : 49 Question Id : 1908898350 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Under the Protection of Plant Varieties and Farmers' Rights Act, the power to correct the clerical error or an obvious mistake in the registration certificate is delegated to

1. Registrar
2. Registrar General
3. Chairman
4. Chairperson

**Options :**

19088933293. 1

19088933294. 2

19088933295. 3

19088933296. 4

**Question Number : 50 Question Id : 1908898351 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements:

**Statement I:** The seed viability equation is a mathematical model that has been developed to predict seed storage life in different environments.

**Statement II:** The seed viability equation applies to both recalcitrant and orthodox seeds

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

**Options :**

19088933297. 1

19088933298. 2

19088933299. 3

19088933300. 4

**Question Number : 51 Question Id : 1908898352 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**



**Correct Marks : 4 Wrong Marks : 1**

Which of the following is a variable cost?

1. Initial investment
2. Interest on loan
3. Wages
4. Cost of production facility

**Options :**

19088933301. 1

19088933302. 2

19088933303. 3

19088933304. 4

**Question Number : 52 Question Id : 1908898353 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

In India, which one of the following is NOT related to guidelines and protocols for the safety assessment of GMOs?

1. IBSC
2. GEAC
3. RCGM
4. NBPGR

**Options :**

19088933305. 1

19088933306. 2

19088933307. 3

19088933308. 4

**Question Number : 53 Question Id : 1908898354 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



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Which of the following is not protected by IP legislation?

1. Trademarks
2. Trade secrets
3. Patents
4. Industrial designs

**Options :**

19088933309. 1

19088933310. 2

19088933311. 3

19088933312. 4

**Question Number : 54 Question Id : 1908898355 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The permit to import germplasm/GMOs for research purposes in the country is issued by \_\_\_\_\_?

1. Director, NBPGR
2. Director, IISS
3. Plant Protection Advisor to Government of India
4. Director, NSRTC

**Options :**

19088933313. 1

19088933314. 2

19088933315. 3

19088933316. 4

**Question Number : 55 Question Id : 1908898356 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



The Indian Biological Diversity Act was passed in the Parliament in the year 2002, the authority constituted thereby has its headquarters in:

1. New Delhi
2. Bengaluru
3. Chennai
4. Kolkata

**Options :**

19088933317. 1

19088933318. 2

19088933319. 3

19088933320. 4

**Question Number : 56 Question Id : 1908898357 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Self-pollination in plants results in

1. increased homozygosity
2. increased heterozygosity
3. heterosis
4. asexuality

**Options :**

19088933321. 1

19088933322. 2

19088933323. 3

19088933324. 4

**Question Number : 57 Question Id : 1908898358 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Reduction in genetic variation that occurs when a small subset of individuals occupy and establish in a new colony:

1. Bottleneck effect
2. Founder effect
3. Domestication
4. Population sub-structure

**Options :**

19088933325. 1

19088933326. 2

19088933327. 3

19088933328. 4

**Question Number : 58 Question Id : 1908898359 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Highly valued cotton variety called Egyptian cotton belongs to the species

1. *Gossypium herbaceum*
2. *G. barbadense*
3. *G. arboreum*
4. *G. hirsutum*

**Options :**

19088933329. 1

19088933330. 2

19088933331. 3

19088933332. 4

**Question Number : 59 Question Id : 1908898360 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Carrot (*Daucus carota*) belongs to the family

1. Apiaceae
2. Cruciferae
3. Fabaceae
4. Solanceae

**Options :**

19088933333. 1

19088933334. 2

19088933335. 3

19088933336. 4

**Question Number : 60 Question Id : 1908898361 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which among the following is not the amber colored, dwarf and high yielding variety of wheat developed and released for cultivation in India that resulted in green revolution

1. Kalyan Sona
2. Sonalika
3. Lerma Rojo
4. Sharbati Sonara

**Options :**

19088933337. 1

19088933338. 2

19088933339. 3

19088933340. 4

**Question Number : 61 Question Id : 1908898362 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



The language used for scientific nomenclature of plants is

1. English
2. Spanish
3. Latin
4. Roman

**Options :**

19088933341. 1

19088933342. 2

19088933343. 3

19088933344. 4

**Question Number : 62 Question Id : 1908898363 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

An example of multilocus dominant DNA marker

1. AFLP
2. RFLP
3. STMS
4. SSR

**Options :**

19088933345. 1

19088933346. 2

19088933347. 3

19088933348. 4

**Question Number : 63 Question Id : 1908898364 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following does not contribute as good evidence for the Origin of Agriculture:

1. Phytoliths
2. Coprolites
3. Charred seeds
4. Soil composition



**Options :**

19088933349. 1

19088933350. 2

19088933351. 3

19088933352. 4

**Question Number : 64 Question Id : 1908898365 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The old World consists of all, **except** one of the following geographical areas :

1. Africa
2. Europe
3. Asia
4. Few Atlantic islands

**Options :**

19088933353. 1

19088933354. 2

19088933355. 3

19088933356. 4

**Question Number : 65 Question Id : 1908898366 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following phenomenon **would not** necessarily give rise to true-to-type plants :

1. Polyembryony
2. Asexual reproduction
3. Apomixis
4. Parthenocarpy

**Options :**

19088933357. 1

19088933358. 2

19088933359. 3



19088933360. 4

**Question Number : 66 Question Id : 1908898367 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Regeneration of germplasm stored in Long term Genebank is carried out when the seed viability drops below:

1. 65% of the initial viability
2. 75% of the initial viability
3. 85% of the initial viability
4. 90% of the initial viability

**Options :**

19088933361. 1

19088933362. 2

19088933363. 3

19088933364. 4

**Question Number : 67 Question Id : 1908898368 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

For registration of plant varieties at PPV & FR, it is **not** essential to have one of the following criteria of :

1. Distinctiveness
2. Uniqueness
3. Stability
4. Uniformity

**Options :**

19088933365. 1

19088933366. 2

19088933367. 3

19088933368. 4



**Question Number : 68 Question Id : 1908898369 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The High constant temperature oven method for determining moisture content of seeds is to be used for one of the following :

1. Any types of seeds
2. Oily seeds alone
3. Large sized seeds only
4. Protein and starch rich, non-oily seeds

**Options :**

19088933369. 1

19088933370. 2

19088933371. 3

19088933372. 4

**Question Number : 69 Question Id : 1908898370 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Match List I with List II

List I	List II
Methodology / microscopy	Its utilization in plant sciences
A. ELISA	I. Study of surfaces of biomaterials
B. GISH	II. Reconstruction of 3-D structures
C. SEM	III. Detection of translocation
D. TEM	IV. Detection of plant viruses
E. Confocal microscopy	V. Study of internal features of cells & organelles

Choose the correct answer from the options given below:

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

**Options :**



19088933373. 1

19088933374. 2

19088933375. 3

19088933376. 4

**Question Number : 70 Question Id : 1908898371 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Seed dormancy is controlled by all, **except** one of the following:

1. Light
2. Duration of seed storage
3. Temperature
4. Seed volume

**Options :**

19088933377. 1

19088933378. 2

19088933379. 3

19088933380. 4

## Part C : Genetics and Plant Breeding

**Section Id :** 190889151

**Section Number :** 3

**Section type :** Online

**Mandatory or Optional :** Mandatory

**Number of Questions :** 50

**Number of Questions to be attempted :** 50

**Section Marks :** 200

**Enable Mark as Answered Mark for Review and**

**Clear Response :**

**Sub-Section Number :**



**Sub-Section Id :**

190889191

**Question Shuffling Allowed :**

Yes

**Question Number : 71 Question Id : 1908898372 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Operation of checkpoints in the cell cycle ensures to give rise to genetically identical daughter cells by cell cycle. The order of the phases of the check points are given. Chose the correct order of check points in the cell cycle.

1. G<sub>1</sub>, G<sub>2</sub>, M
2. S, G<sub>2</sub>, M
3. G<sub>1</sub>, S, G<sub>2</sub>
4. G<sub>1</sub>, G<sub>2</sub>, S

**Options :**

19088933381. 1

19088933382. 2

19088933383. 3

19088933384. 4

**Question Number : 72 Question Id : 1908898373 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Indicate, which order of activity in mitotic cell division is a correct order

1. Kinetochore microtubules disappear- Chromosomes are arranged in the equatorial plane- Nucleolus disappears-- Sister chromatids of chromosomes split
2. Nucleolus disappears- Chromosomes are arranged in the equatorial plane- Sister chromatids of chromosomes split - Kinetochore microtubules disappear
3. Nucleolus disappears-Kinetochore microtubules disappear- Chromosomes are arranged in the equatorial plane-- Sister chromatids of chromosomes split
4. Sister chromatids of chromosomes split- Nucleolus disappears - Kinetochore microtubules disappear- Chromosomes are arranged in the equatorial plane

**Options :**

19088933385. 1

19088933386. 2



19088933387.3

19088933388.4

**Question Number : 73 Question Id : 1908898374 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

In Eukaryotes, one of the following cells opt out of the cell cycle permanently and retired from the cell cycle.

1. Muscle cell
2. Brain cell
3. Skin cell
4. Germ cell

**Options :**

19088933389.1

19088933390.2

19088933391.3

19088933392.4

**Question Number : 74 Question Id : 1908898375 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

In which phase of meiosis the chromatids separate and go to opposite poles

1. Prophase I
2. Anaphase I
3. Metaphase II
4. Anaphase II

**Options :**

19088933393.1

19088933394.2

19088933395.3

19088933396.4



Question Number : 75 Question Id : 1908898376 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The nonreciprocal interaction of nonallelic genes is called

1. Epigenetics
2. Epistasis
3. Incomplete dominance
4. Codominance

Options :

19088933397. 1

19088933398. 2

19088933399. 3

19088933400. 4

Question Number : 76 Question Id : 1908898377 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In guinea pigs, black (B-) is dominant to white (bb). Assorting independently on a different pair of homologues, short hair (S-) is dominant to long hair (ss). In the parental generation, pure (homozygous) black, short-haired pigs are crossed to white, long-haired pigs. In the F<sub>2</sub> we expect the following phenotypes. Match the phenotypes with that of the genotypic frequency and choose which order of matching is a correct match

List I	List II
Phenotype	Genotypic Frequency
A. Black, short	I. 1/4
B. Black, long	II. 3/16
C. White, short	III. 1/16
D. White, long	IV. 9/16

Choose the correct answer from the options given below:

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

Options :



19088933401. 1

19088933402. 2

19088933403. 3

19088933404. 4

**Question Number : 77 Question Id : 1908898378 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Important advances that contributed to the development of genetics is given in the table along with the inventors. Find the correct match order of discovery ( List I) and discoverer (List II)

List I	List II
Discovery	Discoverer
A. DNA as genetic material	I. Muller
B. Genes consist of DNA	II. Meselson and Stahl
C. Semiconservative replication of DNA	III. Hershey and Chase
D. DNA repair	IV. Avery, MacLeod, McCarty

Choose the *correct* answer from the options given below:

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

**Options :**

19088933405. 1

19088933406. 2

19088933407. 3

19088933408. 4

**Question Number : 78 Question Id : 1908898379 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Find out which of the four combination of elements occupies close to 99% of the weight of a prokaryotic living cell.

1. Carbon - Phosphate - Nitrogen - Oxygen
2. Hydrogen - Oxygen - Nitrogen - Amino acids
3. Carbon - Hydrogen- Nitrogen - Oxygen
4. Carbon - Hydrogen- Sulphur - Oxygen

**Options :**

19088933409. 1

19088933410. 2

19088933411. 3

19088933412. 4

**Question Number : 79 Question Id : 1908898380 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Name the amino acid in the given four, which is not hydrophilic in nature

1. Serine
2. Threonine
3. Tyrosine
4. Leucine

**Options :**

19088933413. 1

19088933414. 2

19088933415. 3

19088933416. 4

**Question Number : 80 Question Id : 1908898381 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



If the DNA double helix has physical dimension with a diameter of  $20 \text{ \AA}$  ( $2 \times 10^{-6} \text{ mm}$ ); a helical turn repeats itself at intervals of  $3.6 \text{ nm}$  ( $36 \text{ \AA}$ ), about 10.5 base pairs per turn; then that form of DNA is

1. Z-DNA
2. A-DNA
3. B-DNA
4. C-DNA

**Options :**

19088933417. 1

19088933418. 2

19088933419. 3

19088933420. 4

**Question Number : 81 Question Id : 1908898382 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

This RNA has a characteristic, clover leaf like structure

1. tRNA
2. mRNA
3. siRNA
4. rRNA

**Options :**

19088933421. 1

19088933422. 2

19088933423. 3

19088933424. 4

**Question Number : 82 Question Id : 1908898383 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



The pollination mechanisms of different crop species are given; find the best match from List I to List II

List I	List II
Crop	Flower Sexuality
A. Alfalfa	I. Dicliny
B. Papaya	II. Herkogamy
C. Linseed	III. Protogyny
D. Pearl millet	IV. Heterostyly

Choose the *correct* answer from the options given below:

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

**Options :**

19088933425. 1

19088933426. 2

19088933427. 3

19088933428. 4

**Question Number : 83 Question Id : 1908898384 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Among the various anti-nutritional factors indicated below in chickpea; find the protein anti-nutritional factor

1. Alkaloids
2. Trypsin inhibitors
3. Tannins
4. Phytic acid

**Options :**

19088933429. 1

19088933430. 2

19088933431. 3

19088933432. 4



**Question Number : 84 Question Id : 1908898385 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Find the true facts about gamma rays from the following statements:

A. Gamma rays have generally a longer wavelength and hence possess more energy per photon than X rays

B. Gamma radiation is usually obtained from radioisotopes in contrast to X-rays

C. Cobalt-60 and Cesium -137 are the main sources of gamma rays used in mutation breeding.

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

1. A and B are true
2. B and C are true
3. A and C are true
4. A alone is true

**Options :**

19088933433. 1

19088933434. 2

19088933435. 3

19088933436. 4

**Question Number : 85 Question Id : 1908898386 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Mendel gave the formula to determine the number of genotypes, phenotypes, gametes produced and population size. If the genotype is  $AaBbCc$  and the cross made is  $AaBbCc \times AaBbCc$ ; pertaining to the cross between  $AaBbCc \times AaBbCc$ , match the List I with List II

List I	List II
A. Different kinds of gametes produced by $F_1$ heterozygote	I. 64
B. Different kinds of genotypes in $F_2$	II. 27
C. Different kinds of $F_2$ genotypes that are heterozygous	III. 8
D. Perfect population size in $F_2$	IV. 19

Choose the correct answer from the options given below:

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

**Options :**

19088933437. 1

19088933438. 2

19088933439. 3

19088933440. 4

**Question Number : 86 Question Id : 1908898387 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Cytoplasmic genic male sterility arises from the interaction of nuclear and cytoplasmic genes. The interaction of both determines the sterility or fertility in plants. Out of the following, which are all the combinations of nuclear (Ms/ms) and cytoplasmic (F/S) genes show fertility in plants

A. MsMs genes with F cytoplasm

B. MsMs genes with S cytoplasm

C. Msms genes with F cytoplasm

D. Msms genes with S cytoplasm

Choose the *correct* answer from the options given below:

1. A Only
2. A and B only
3. A, B and C only
4. A, B, C and D

**Options :**

19088933441. 1

19088933442. 2

19088933443. 3

19088933444. 4

**Question Number : 87 Question Id : 1908898388 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Cordeiro et al.,(2007) have described different species of sugarcane based on the common name and their importance. Match the List I with List II

List I	List II
Sugarcane species	Relevance
A. <i>S. barbari</i>	I. Wild cane
B. <i>S. robustum</i>	II. Probable ancestor of <i>S. officinarum</i>
C. <i>S. spontaneum</i>	III. Indian cane
D. <i>S. edule</i>	IV. Domesticated form with aborted flowers

Choose the *correct* answer from the options given below:

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

**Options :**

19088933445. 1

19088933446. 2

19088933447. 3

19088933448. 4

**Question Number : 88 Question Id : 1908898389 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



While studying the gene actions of polygenes -how these genes affect the phenotypic expression of a quantitative trait, four types of gene action are recognized: additive, dominance, epistasis, and overdominance. Match the List I with List II

List I	List II
Statement	Relevance
A. The action of genes affecting a genetic trait in such a fashion that each enhances the expression of the trait	I. Dominance effects
B. If the heterozygote is more like one parent than the other	II. Epistasis effects
C. The interaction of genes at different loci	III. Additive effects
D. When each allele contributes a separate effect, and the combined alleles contribute an effect greater than that of either allele separately	IV. Overdominance effects

Choose the *correct* answer from the options given below:

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

**Options :**

19088933449. 1

19088933450. 2

19088933451. 3

19088933452. 4

**Question Number : 89 Question Id : 1908898390 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



The mating patterns of actual organisms frequently do not exhibit the random mating assumed by Hardy–Weinberg. Match the description for mating in List I to the mating type in List II.

List I	List II
A. Non-random mating	I. Positive assortative mating
B. When individuals with like genotypes or phenotypes tend to mate	II. Assortative mating
C. When individuals with unlike genotypes or phenotypes tend to mate	III. Biparental inbreeding
D. Mating among related individuals	IV. Disassortative mating

Choose the correct match combination given below

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

**Options :**

19088933453. 1

19088933454. 2

19088933455. 3

19088933456. 4

**Question Number : 90 Question Id : 1908898391 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Which of the following are true statements while explaining heterosis in plants .

A. Making random crosses are more effective in consistently producing high-performing hybrids than breeding from distinct heterotic pools

B. Hybrid performance is modeled as the sum of each parental GCA and the SCA, of the parent pair

C. GCA corresponds to epistatic effects

D. SCA corresponds to dominance effects

Choose the *correct* answer from the options given below:

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

**Options :**

19088933457. 1

19088933458. 2

19088933459. 3

19088933460. 4

**Question Number : 91 Question Id : 1908898392 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



It is estimated that about one third of the flowering plants are polyploids. The types of polyploids are listed in List I and their symbolic descriptions are jumbled in List II . Match the correct description with the type of polyploid.

List I	List II
A. Allotetraploidy	I. $4x$
B. Allohexaploidy	II. $2x_1 + 2x_2 + 2x_3 + 2x_4$
C. Autotetraploidy	III. $2x_1 + 2x_2$
D. Allooctaploidy	IV. $2x_1 + 2x_2 + 2x_3$

Choose the *correct* answer from the options given below:

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

**Options :**

19088933461. 1

19088933462. 2

19088933463. 3

19088933464. 4

**Question Number : 92 Question Id : 1908898393 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Oryza has been classified into four species complexes namely, *sativa* complex, *officinalis* complex, *meyeriana* complex, and *ridleyi* complex, which is listed in List I . One species example in each has been given in a jumbled form in List II. Match the correct answer and choose the right combination

List I	List II
A. <i>Sativa</i> complex,	I. <i>O. minuta</i>
B. <i>Officinalis</i> complex	II. <i>O. nivara</i>
C. <i>Meyeriana</i> complex	III. <i>O. granulata</i>
D. <i>Ridleyi</i> complex	IV. <i>O. longiglumis</i>

Choose the *correct* answer from the options given below:

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

**Options :**

19088933465. 1

19088933466. 2

19088933467. 3

19088933468. 4

**Question Number : 93 Question Id : 1908898394 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



In maize, six single crosses obtained from four inbreds and their yield performance are given below.

Single crosses	Yield in Kg.
(AxB)	4500
(CxD)	5000
(AxC)	4000
(BxD)	5500
(AxD)	6000
(BxC)	3500

What will be the predicted yield (Kg.) performance of the double cross (AxB) x(CxD)

1. 5750
2. 4750
3. 6250
4. 3750

**Options :**

19088933469. 1

19088933470. 2

19088933471. 3

19088933472. 4

**Question Number : 94 Question Id : 1908898395 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Which of the following are true statements with reference to  $V_r$ - $W_r$  Graph.

- A. When the regression line passes through origin, it indicates complete dominance
- B. When the regression line passes above origin, cutting  $W_r$  axis, it suggests absence of dominance
- C. When the regression line passes above origin, cutting  $W_r$  axis and touching the limiting parabola, it suggests partial dominance
- D. When the regression line passes below origin, cutting  $V_r$  axis, it denotes the presence of over dominance

Choose the *correct* answer from the options given below

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

**Options :**

19088933473. 1

19088933474. 2

19088933475. 3

19088933476. 4

**Question Number : 95 Question Id : 1908898396 Question Type : MCQ Option Shuffling : No Is**

**Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given a normal chromosome with segments labeled C123456 (C = centromere), a homologue containing an inversion including regions 3-5, and a single 2-strand crossover between regions 4 and 5; then the acentric fragment present during first meiotic anaphase is

- 1. 63456
- 2. 12344321
- 3. 65521
- 4. 654321

**Options :**

19088933477. 1

19088933478. 2

19088933479. 3



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19088933480. 4

**Question Number : 96 Question Id : 1908898397 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The ANOVA or analysis of variance was created in the year 1918 by?

1. F.W. Went
2. R. A. Fischer
3. Karl Pearson
4. W. S. Gosset

**Options :**

19088933481. 1

19088933482. 2

19088933483. 3

19088933484. 4

**Question Number : 97 Question Id : 1908898398 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Statistician J.W. Tukey has developed?

- A. Fast Fourier Transform algorithm
- B. Box plot
- C. Tukey range test
- D. t-test

Choose the *correct* answer from the options given below:

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

**Options :**

19088933485. 1



19088933486. 2

19088933487. 3

19088933488. 4

**Question Number : 98 Question Id : 1908898399 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

In the IUCN category, threatened species include those which are?

- A. Rare
- B. Endangered
- C. Vulnerable
- D. Extinct

Choose the *correct* answer from the options given below:

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

**Options :**

19088933489. 1

19088933490. 2

19088933491. 3

19088933492. 4

**Question Number : 99 Question Id : 1908898400 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Given below are two statements

**Statement I:** Many countries recognize plant variety as intellectual property and grant them protection through plant breeders' rights.

**Statement II:** TRIPs became effective on 01st January 1996.

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

**Options :**

19088933493. 1

19088933494. 2

19088933495. 3

19088933496. 4

**Question Number : 100 Question Id : 1908898401 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

If any parent has seven children, then what is the probability of having 4 males and 3 females?

1.  $\frac{1}{2}$
2.  $\frac{1}{35}$
3.  $\frac{35}{128}$
4.  $\frac{7}{128}$

**Options :**

19088933497. 1

19088933498. 2

19088933499. 3

19088933500. 4

**Question Number : 101 Question Id : 1908898402 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**



**Correct Marks : 4 Wrong Marks : 1**

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

**Assertion A** : The table values of chi-square are entirely due to chance.

**Reason R** : If the calculated value of chi-square is less than the table value, the deviation observed from the expected value is purely due to chance.

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

**Options :**

19088933501. 1

19088933502. 2

19088933503. 3

19088933504. 4

**Question Number : 102 Question Id : 1908898403 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Match **List I** with **List II**

<b>List I (Authority/Institution/Organization)</b>	<b>List II (Headquarter)</b>
A. PPVFRA	I. Patancheru
B. National Biodiversity Authority	II. Nagpur
C. Rajiv Gandhi National Institute of Intellectual Property Management	III. Chennai
D. ICRISAT	IV. NewDelhi

Choose the **correct** answer from the options given below:

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

**Options :**



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19088933505. 1

19088933506. 2

19088933507. 3

19088933508. 4

**Question Number : 103 Question Id : 1908898404 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements

**Statement I:** Linkage disequilibrium (LD) is the random association between alleles of two or more loci in a population irrespective of their physical location.

**Statement II:** LD may exist between linked or unlinked genes (due to epistatic interaction).

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

**Options :**

19088933509. 1

19088933510. 2

19088933511. 3

19088933512. 4

**Question Number : 104 Question Id : 1908898405 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



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

**Assertion A** : Oxford Nanopore sequencing platform is not recommended for gene expression quantification.

**Reason R** : Short read sequencing is considered good for RNA-Seq analysis.

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

**Options :**

19088933513. 1

19088933514. 2

19088933515. 3

19088933516. 4

**Question Number : 105 Question Id : 1908898406 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements

**Statement I:** In QTL mapping, appropriate statistical packages are used to analyze the genotypic information.

**Statement II:** In QTL mapping, appropriate statistical packages are used to analyze the phenotypic information.

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

**Options :**

19088933517. 1



19088933518. 2

19088933519. 3

19088933520. 4

**Question Number : 106 Question Id : 1908898407 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Reverse breeding involves:

- A. Recombination by knockdown of meiotic crossing over.
- B. Selection of male/female spores having combinations of recombinant parental chromosomes.
- C. In vitro spore culture to generate homozygous doubled haploids (DHs).
- D. Selection of complementary parents to reconstitute the heterozygote.

Choose the *correct* answer from the options given below:

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

**Options :**

19088933521. 1

19088933522. 2

19088933523. 3

19088933524. 4

**Question Number : 107 Question Id : 1908898408 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Given below are two statements

**Statement I:** si-RNA are evolutionarily conserved, time, order, and tissue-specific in nature.

**Statement II:** mi-RNA are usually exogenous in nature and are induced upon viral infection.

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

**Options :**

19088933525. 1

19088933526. 2

19088933527. 3

19088933528. 4

**Question Number : 108 Question Id : 1908898409 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements

**Statement I:** Parametric tests include assumptions and hypotheses about parameters e.g. t-tests and ANOVA

**Statement II:** Non-parametric tests neither require assumptions nor they test hypotheses about population parameters e.g. Chi-square.

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

**Options :**

19088933529. 1

19088933530. 2



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19088933531. 3

19088933532. 4

**Question Number : 109 Question Id : 1908898410 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

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

**Assertion A :** In the Cleaved Amplified Polymorphic Sequence (CAPS) marker system, the PCR amplified DNA fragments are digested with some restriction endonuclease.

**Reason R :** The length polymorphism in CAPS marker is due to the difference in the presence of restriction sites (in the PCR amplified product).

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

**Options :**

19088933533. 1

19088933534. 2

19088933535. 3

19088933536. 4

**Question Number : 110 Question Id : 1908898411 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

RFLP markers are converted into which marker by sequencing the RFLP fragments and designing primers for their amplification?

1. CAPS marker
2. EST-SSR marker
3. AP-PCR marker
4. STS marker



**Options :**

19088933537. 1

19088933538. 2

19088933539. 3

19088933540. 4

**Question Number : 111 Question Id : 1908898412 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

If the primary RNA transcript of any gene is 2500 nucleotides long, but the mature mRNA that is translated on the ribosome is 1350 nucleotides long. This size difference is primarily due to:

1. Capping and cleavage of mRNA
2. Cleavage of polycistronic mRNA
3. Splicing
4. Removal of poly-A tails

**Options :**

19088933541. 1

19088933542. 2

19088933543. 3

19088933544. 4

**Question Number : 112 Question Id : 1908898413 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Given below are two statements

**Statement I:** The hybridization of a probe to filter bound DNA (which was transferred from a gel) is known as Northern Hybridization.

**Statement II:** The hybridization of a probe to filter bound RNA (which was transferred from a gel) is known as Southern Hybridization

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

**Options :**

19088933545. 1

19088933546. 2

19088933547. 3

19088933548. 4

**Question Number : 113 Question Id : 1908898414 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

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

**Assertion A :** Leaf rolling is a very peculiar response to water deficit stress, particularly in cereal crops.

**Reason R :** Many stress proteins such as dehydrins, osmotins, etc. may be produced in response to ABA.

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

**Options :**

19088933549. 1



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19088933550. 2

19088933551. 3

19088933552. 4

**Question Number : 114 Question Id : 1908898415 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements

**Statement I:** Aluminium (Al) toxicity in plants may be observed when soil pH is  $<5.5$ .

**Statement II:** Some plant species show Al-resistance by raising the pH of the rhizosphere.

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

**Options :**

19088933553. 1

19088933554. 2

19088933555. 3

19088933556. 4

**Question Number : 115 Question Id : 1908898416 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



Match List I with List II

List I (Discoverer)	List II (Discovery/Hypothesis)
A. Benedict Prevost	I. Gene for gene relationship
B. Blakeslee	II. Wheat bunt by fungus
C. Stakman	III. Mating type differentiation in Rhizopus
D. Flor	IV. Physiological differentiation in wheat rust

Choose the correct answer from the options given below:

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

**Options :**

19088933557. 1

19088933558. 2

19088933559. 3

19088933560. 4

**Question Number : 116 Question Id : 1908898417 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

If a genotype is unattractive for colonization and or oviposition by an insect pest, this mechanism is known as?

1. Antibiosis
2. Antixenosis
3. Xenobiotics
4. Xenosis

**Options :**

19088933561. 1

19088933562. 2

19088933563. 3

19088933564. 4



**Question Number : 117 Question Id : 1908898418 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

In the year 1982, for the first time who has identified '2-acetyl-1-pyrroline' (2-AP) as the main compound giving a pleasant aroma in the scented rice?

1. Ron Buttery and co-workers
2. Y. Obata and H. Tanaka
3. T. Hayata and co-workers
4. Robert Henry and co-workers

**Options :**

19088933565. 1

19088933566. 2

19088933567. 3

19088933568. 4

**Question Number : 118 Question Id : 1908898419 Question Type : MCQ Option Shuffling : No**

**Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

The 'compulsory labeling' of any notified variety ensures the following:

- A. Seeds having prescribed limit of germination
- B. Seeds having prescribed limit of purity
- C. Seed container is labeled in a prescribed manner
- D. Label truly representing the seed quality

Choose the *correct* answer from the options given below:

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

**Options :**

19088933569. 1

19088933570. 2



19088933571. 3

19088933572. 4

**Question Number : 119 Question Id : 1908898420 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following is essential for making a valid estimate of error variance and to provide a valid test of significance?

- A. Replication
- B. Randomization
- C. Local control
- D. Chi square

Choose the *correct* answer from the options given below:

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

**Options :**

19088933573. 1

19088933574. 2

19088933575. 3

19088933576. 4

**Question Number : 120 Question Id : 1908898421 Question Type : MCQ Option Shuffling : No  
Is Question Mandatory : No**

**Correct Marks : 4 Wrong Marks : 1**



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Which of the following is correct for the *Escherichia coli* based blue-white color test?

- A. *Escherichia coli lacZ* gene encodes beta-galactosidase.
- B. Beta-galactosidase converts colorless substrate X-gal into a blue product.
- C. Cells having beta-galactosidase activity produce blue bacterial colonies when not grown on X-gal.
- D. Cells lacking beta-galactosidase activity produce white bacterial colonies.

Choose the *correct* answer from the options given below:

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

**Options :**

19088933577. 1

19088933578. 2

19088933579. 3

19088933580. 4

