

Test Booklet No. _____

This booklet consists of 150 questions and 20 printed pages.

RGUPET/2024/___/___

RGUPET 2024
Common Entrance Test, 2024
DOCTOR OF PHILOSOPHY IN GENETIC AND PLANT BREEDING

Full Marks: 150
Hours

Time: 3

Roll No.

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Day and Date of Examination: _____

Signature of Invigilator(s) _____

Signature of Candidate _____

General Instructions:

PLEASE READ ALL THE INSTRUCTIONS CAREFULLY BEFORE MAKING ANY ENTRY.

1. DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO.
2. Candidate must write his/her Roll Number on the space provided.
3. This Test Booklet contains 150 Multiple Choice Questions (MCQs) from the concerned subject. Each question carries 1 mark.
4. Please check the Test Booklet to verify that the total pages and total number of questions contained in the test booklet are the same as those printed on the top of the first page. Also check whether the questions are in sequential order or not.
5. Candidates are not permitted to enter into the examination hall after the commencement of the entrance test or leave the examination hall within two hour.
6. Making any identification mark in the OMR Answer Sheet or writing Roll Number anywhere other than the specified places will lead to disqualification of the candidate.
7. Candidates shall maintain silence inside and outside the examination hall. If candidates are found violating the instructions mentioned herein or announced in the examination hall, they will be summarily disqualified from the entrance test.
8. In case of any dispute, the decision of the Entrance Test Committee shall be final and binding.
9. The OMR Answer Sheet consists of two copies, the Original copy and the Student's copy.

1	Which of the following sentences correctly demonstrates indirect speech?				Answer option (a,b,c or d)
	a) She said, "I am going to the store."	b) He asked if they had finished the project.	c) "Please close the door," he shouted.	d) "I'll be there at 5," she promised.	b
2	Identify the sentence written in direct speech				Answer option (a,b,c or d)
	a) She told him to be quiet	b) "I'll be there in five minutes," he said	c) He asked if they had finished the project	d) "Please turn off the lights,"	b
3	Pick the simple sentence correct transformation of the sentence given: He is too soft for the job of an army man.				Answer option (a,b,c or d)
	a) He is soft but army man cannot be soft	b) He is so soft that he is not suitable for the job of an army man	c) He cannot be an army man if he is so soft	d) He cannot be an army man since he is very soft	b
4	Synonyms for FOSTERING				Answer option (a,b,c or d)
	a) Safeguarding	b) Neglecting	c) Ignoring	d) Nurturing	d
5	Which of the following sentences is grammatically correct? i Sorry, I spilled some juice in the floor. ii Sorry, I spilled some juice upon the floor. iii Sorry, I spilled some juice on the floor. iv Sorry, I spilled some juice into the floor.				Answer option (a,b,c or d)
	a) i	b) ii	c) iii	d) iv	c
6	Match the following pairs:				Answer option (a,b,c or d)
	A) Isaac Newton	i Theory of General Relativity			
	B) Albert Einstein	ii Law of Universal Gravitation			
	C) Marie Curie	iii Discovery of Radioactivity			
	D) Charles Darwin	iv Theory of Evolution by Natural Selection			
	a) iii-ii-iv-i	b) ii-i-iii-iv	c) i-ii-iii-iv	d) i-ii-iv-iii	b
7	Which planet is known as the "Red Planet"?				Answer option (a,b,c or d)
	a) Venus	b) Mars	c) Jupiter	d) Saturn	b
8	The 2020 Summer Olympics was held in				Answer option (a,b,c or d)
	a) United States	b) Japan	c) China	d) Australia	b

9	Which state of North East India is known as the "Land of the Dawn-Lit Mountains"?				Answer option (a,b,c or d)
	a) Manipur	b) Nagaland	c) Mizoram	d) Arunachal Pradesh	d
10	SMART (Supersonic Missile Assisted Release of Torpedo) system, recently seen in the news, was developed by which organization				Answer option (a,b,c or d)
	a) DRDO	b) ISRO	c) CSIR	d) BARC	a
11	Recently, which country won the gold medal in the Archery World Cup in the men's recurve event				Answer option (a,b,c or d)
	a) India	b) South Korea	c) Malaysia	d) Indonesia	a
12	Recently, which country launched first Angara-A5 space rocket				Answer option (a,b,c or d)
	a) Russia	b) India	c) Malaysia	d) Indonesia	a
13	Hangpan Dada Memorial trophy is associated with				
	a) Hockey	b) Badminton	c) Football	d) Wushu	c)
14	The G20 Summit 2023, held in India, focused on which of the following: A. Climate Change B. Global Health C. Digital Transformation D. Military Alliances				Answer option (a,b,c or d)
	a) A, B & D only	b) A, B & C only	c) B, C & D only	d) A, C & D only	b) A, B & C only
15	Which country is set to host the 9 th ICC Women's T20 World Cup 2024?				b
	a) Australia	b) Bangladesh	c) England	d) New Zealand	Bangladesh
16	The present ages of Rita and Sita are in the ratio 6:7. If Sita is 4 years older than Rita, after 4 years what will be the ratio of their ages?				a
	a) 7:8	b) 5:8	c) 4:8	d) 8:7	7:8
17	Two ships are sailing in the sea on the two sides of a lighthouse. The angle of elevation of the top of the lighthouse is observed from the ships are 30° and 45° respectively. If the lighthouse is 100 m high, the distance between the two ships is:				a
	a) 273 m	b) 173 m	c) 200 m	d) 300 m	273
18	J14, L16, __, P20, R22. What number should fill the blank?				d
	a) S24	b) M18	c) T24	d) N18	N18
19	A and B invest in a business in the ratio 3 : 2. If 5% of the total profit goes to charity and A's share is Rs. 855, the total profit is:				a

	a) 1500	b) 1425	c) 1576	d) 1450	1500
20	An accurate clock shows 8 o'clock in the morning. Through how many degrees will the hour hand rotate when the clock shows 2 o'clock in the afternoon?				d
	a) 144°	b) 150°	c) 168°	d) 180°	180°
21	Which of the following is NOT an ethical consideration in agricultural research?				
	a) Ensuring the welfare of research subjects	b) Maximizing profit for the research institution	c) Respecting the rights and autonomy of research participants	d) Providing truthful and accurate reporting of research findings	b)
22	The Indian Journal of Agricultural Sciences (IJAS) is published by				
	a) Indian Academy of Sciences	b) Indian Council of Agricultural Research	c) Indian Society of Genetics and Plant Breeding	d) Current Science Association	b)
23	What is the primary purpose of obtaining informed consent in agricultural research?				
	a) To protect the privacy of research participants	b) To avoid legal liability for the research institution	c) To recruit participants without their knowledge	d) To ensure that participants are fully aware of the risks and benefits of participation	d)
24	Indian Journal of Genetics and Plant Breeding (IJGPB) is published on which basis?				
	a) yearly	b) weekly	c) monthly	d) quarterly	d)
25	What is the primary research question or hypothesis?				Answer option (a,b,c or d)
	a) The significance of the study	b) The main question or hypothesis the research seeks to answer	c) The background of the problem	d) The expected outcomes	b
26	Why is the research question important?				Answer option (a,b,c or d)
	a) It is a common question	b) It will have no impact on the field	c) It addresses a significant problem and has a potential impact	d) It is already well understood	c
27	What existing literature and previous studies are relevant to your research?				Answer option (a,b,c or d)

	a) Outdated Studies	b) Research unrelated to your topic	c) Relevant and recent studies on your topic	d) Non-scholarly articles	c
28	How does your research build on or differ from previous studies?				Answer option (a,b,c or d)
	a) It repeats previous studies exactly	b) It fills gaps or introduces new perspectives	c) It ignores previous studies	d) It contradicts all previous findings without justification	B
29	Who is your target population?				Answer option (a,b,c or d)
	a) A group unrelated to the research question	b) The group of individuals/entities your study focuses on	c) Any random group	d) A group that cannot provide relevant data	b
30	Match the following:				Answer option (a,b,c or d)
	A) Literature Review		i Specific, manageable goals of the study		
	B) Research Objectives		ii Gaps in the existing literature		
	C) Target Population		iii Group of individuals/entities your study focuses on		
	D) Data Collection Methods		iv Surveys, interviews, observations, etc.		
	a) ii-i-iii-iv	b) i-ii-iv-iii	c) iii-ii-iv-i	d) i-ii-iii-iv	a
31	Match the following:				Answer option (a,b,c or d)
	A) Data Analysis		i Informed consent, confidentiality, etc.		
	B) Ethical Considerations		ii Appropriate statistical or analytical methods		
	C) Data Collection Instruments		iii Tools used for measuring variables		
	D) Hypothesis		iv Main question the research seeks to answer		
	a) ii-i-iii-iv	b) i-ii-iv-iii	c) iii-ii-iv-i	d) i-ii-iii-iv	a
32	Assertion: Qualitative research methodologies are not suitable for hypothesis testing. Reason: Qualitative research focuses on exploring phenomena in-depth rather than measuring variables.				Answer option (a,b,c or d)
	a) A is true, but R is false.	b) A is false, but R is true.	c) Both A and R are false.	d) Both A and R are true, and R is the correct explanation of A.	d

33	The following statement is true? “Experimental research design is the only method that can establish causality.”				Answer option (a,b,c or d)
	a) True	b) False	c) Partially true	d) Can't be determined	a
34	In which sampling method does every k^{th} individual from a list get selected?				Answer option (a,b,c or d)
	a) Simple random sampling	b) Systematic sampling	c) Cluster sampling	d) Snowball sampling	b
35	What is a key characteristic of cluster sampling?				Answer option (a,b,c or d)
	a) Selecting individuals randomly from a population	b) Selecting entire groups or clusters from a population	c) Selecting based on the researcher's judgment	d) Selecting individuals based on convenience	b
36	Which sampling method is most likely to introduce bias due to ease of access to the sample?				Answer option (a,b,c or d)
	a) Simple random sampling	b) Systematic sampling	c) Stratified sampling	d) Convenience sampling	d
37	What is the primary disadvantage of using convenience sampling?				Answer option (a,b,c or d)
	a) It is time-consuming	b) It requires a large sample size	c) It is prone to sampling bias	d) It is difficult to implement	c
38	What type of sampling is most appropriate for studying a rare or hard-to-find population?				Answer option (a,b,c or d)
	a) Simple random sampling	b) Systematic sampling	c) Cluster sampling	d) Snowball sampling	d
39	Which measure of central tendency is most affected by outliers?				Answer option (a,b,c or d)
	a) Mean	b) Median	c) Mode	d) Range	a
40	What does the interquartile range (IQR) measure?				Answer option (a,b,c or d)
	a) The difference between the highest and lowest values	b) The range of the middle 50% of the data	c) The average of all data points	d) The frequency of the most common value	b
41	Which descriptive statistic is not affected by extremely high or low values?				Answer option

					(a,b,c or d)
	a) Mean	b) Median	c) Mode	d) Range	b
42	What is the mode in a data set?				Answer option (a,b,c or d)
	a) The average of all data points	b) The difference between the highest and lowest values	c) The most frequently occurring value	d) The middle value when data is ordered	c
43	Which measure of central tendency should be used for nominal data?				Answer option (a,b,c or d)
	a) Mean	b) Median	c) Mode	d) Range	c
44	What is the correct sequence of steps in accordance with the principles of the scientific method, for interpreting a phenomenon?				a
	(a) Observing, explaining, and testing	(b) Observing, testing, and explaining	(c) Explaining, Observing, and testing	(d) Explaining, testing, and Observing	Observing, explaining, and testing
45	Lengthy research topic could lead to -				Answer option (a,b,c or d)
	a) address the research problems better	b) confusion and inclusive outcome	c) highly variable for drawing materials and methods and inclusive outcome	d) setting betting objectives	b
46	In a perfectly symmetrical distribution, which of the following is true?				Answer option (a,b,c or d)
	a) Mean > Median	b) Mean < Median	c) Mean = Median	d) Mode > Mean	c
47	Assertion: Plagiarism is considered a serious ethical violation in academic publishing. Reason: Plagiarism involves using someone else's work or ideas without proper attribution, which undermines the integrity of the research process.				Answer option (a,b,c or d)
	a) Both A and R are true, and R is the correct explanation of A.	b) Both A and R are true, but R is not the correct explanation of A.	c) A is true, but R is false.	d) A is false, but R is true.	a
48	Which of the following is considered a serious ethical violation in academic publishing?				Answer option (a,b,c or d)

	a) Publishing in an open-access journal	b) Simultaneous submission to multiple journals	c) Including a literature review in the manuscript	d) Using a standardized citation format	b
49	What is the primary purpose of peer review in academic publishing?				Answer option (a,b,c or d)
	a) To increase the length of the publication process	b) To ensure the research adheres to ethical standards and scientific rigor	c) To promote the author's work	d) To collect publication fees from the author	b
50	Which metric provided by Google Scholar indicates the number of papers an author has published that have each been cited at least a certain number of times?				Answer option (a,b,c or d)
	a) Impact Factor	b) h-index	c) Citation count	d) g-index	b
51	Which among the following is true about Multiple-factor hypothesis? i. It was suggested by Yule in 1906 ii. Worked on seed morphology of oats iii. Many small genes have small and cumulative effect iv. Some of the factors follows mendelian inheritance				Answer option
	a) Only iii	b) ii and iv	c) i and iii	d) Only i	c)
52	The tetrazolium test is conducted to assess				
	a) seed vigour	b) seed germination	c) seed health	d) seed viability	d)
53	The center of origin for sunflower (<i>Helianthus annuus</i>) is				
	a) Ethiopia	b) USA	c) Mexico	d) Peru	b)
54	The process of initial introgression of traits from a wild species to a well-adapted genotype is called				
	a) gene pyramiding	b) domestication	c) mutation	d) pre-breeding	d)
55	Assertion (A): Both in-situ and ex-situ conservation methods are essential for preserving plant genetic diversity and preventing genetic erosion. Reason (R): In-situ conservation involves protecting plants outside their natural habitats, while ex-situ conservation involves maintaining plant populations inside their natural habitats				
	a) Both (A) and (B) are true and (R) is the correct explanation	b) Both (A) and (B) are true and (R) is not the correct explanation	c) (A) is false but (R) is true	d) (A) is true but (R) is false	d)
56	Assertion (A): The gene pool concept is primarily concerned with the genetic diversity within individual organisms rather than within populations. Reason (R): The gene pool refers to the total genetic diversity present within a population or species, including all alleles at all gene loci.				
	a) Both (A) and (B) are true and	b) Both (A) and (B) are true and	c) (A) is false but (R) is true	d) (A) is true but (R) is false	c)

	(R) is the correct explanation	(R) is not the correct explanation										
57	Hipoly is a mutant variety											
	a) Wheat	b) Sorghum	c) Barley	d) Bajra	c)							
58	Which hormone is known as the Stress hormone?											
	a) Auxin	b) Gibberellin	c) ABA	d) Cytokinin	c)							
59	Kent is a variety of											
	a) Oats	b) Chickpea	c) Mustard	d) Wheat	a)							
60	Seed multiplication ratio of rice hybrid is											
	a) 100%	b) 80%	c) 75%	d) 60%	a)							
61	Lantern method of hybridization is used in which crop?											
	a) Maize	b) Cotton	c) Rice	d) Sugarcane	d)							
62	<p>Assertion (A): Tissue culture techniques is used for rapid propagation of plants from small explants under controlled laboratory conditions.</p> <p>Reason (R): Tissue culture techniques involve the use of chemical mutagens to induce genetic variation in plants, leading to the development of new traits.</p>											
	a) Both (A) and (B) are true and (R) is the correct explanation	b) Both (A) and (B) are true and (R) is not the correct explanation	c) (A) is false but (R) is true	d) (A) is true but (R) is false	d)							
63	Match the followings											
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>A) Pearl millet</td> <td>i) <i>Setaria italica</i></td> </tr> <tr> <td>B) Foxtail millet</td> <td>ii) <i>Pennisetum glaucum</i></td> </tr> <tr> <td>C) Finger millet</td> <td>iii) <i>Eleusine coracana</i></td> </tr> <tr> <td>D) Kodo millet</td> <td>iv) <i>Paspalum scrobiculatum</i></td> </tr> </table>		A) Pearl millet	i) <i>Setaria italica</i>	B) Foxtail millet	ii) <i>Pennisetum glaucum</i>	C) Finger millet	iii) <i>Eleusine coracana</i>	D) Kodo millet	iv) <i>Paspalum scrobiculatum</i>		
A) Pearl millet	i) <i>Setaria italica</i>											
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D) Kodo millet	iv) <i>Paspalum scrobiculatum</i>											
	a) A- iii, B- i, C- iv, D- ii	b) A- ii, B-i, C- iii, D-iv	c) A-ii, B-iv, C-iii, D-i	d) A-iv, B-i, C-ii, D-iii	b)							
64	Polshenke value of 90 minutes is classified as											
	a) Weak flour	b) medium flour	c) Medium-strong flour	d) Strong flour	c)							
65	Golden Rice was developed by											
	a) Ingo Potrykus and Peter Beyer	b) Jennifer Doudna and Emmanuelle Charpentier	c) Andrew Fire and Craig Mello	d) William Harvey and Caspar Friedrich Wolff	a)							
66	Choose the correct options regarding Indian Patent law											
	<ul style="list-style-type: none"> i) Patent is a territorial right ii) It is given for a limited period iii) Agricultural practices can be patented iv) HQ of patent office is located at New Delhi 											
	a) Only i	b) i, and ii	c) iii and iv	d) ii and iv	b)							
67	Match the followings based on their seed certification tags											

		A) Breeders seed	i) White		
		B) Foundation seed	ii) Opal green		
		C) Certified seed	iii) Golden yellow		
		D) Truthfully labelled seed	iv) Azure blue		
	a) A-iii, B-i, C-iv, D-ii	b) A-ii, B-i, C-iii, D-iv	c) A-ii, B-iv, C-iii, D-i	d) A-iv, B-i, C-ii, D-iii	a)
68	Antinutritional property present in faba bean is				
	a) gossypol	b) vicine	c) phytate	d) BOAA	b)
69	The process of pollination by bats is called				
	a) ornithophily	b) chiropterophily	c) entomophily	d) melittophily	b)
70	The source of cytoplasmic male sterility in rice is				
	a) <i>Ogura</i>	b) <i>Tifton</i>	c) <i>Wild abortive</i>	d) <i>Milo</i>	c)
71	The isolation distance in sorghum plant to avoid contamination with Johnson grass is				
	a) 200 m	b) 400 m	c) 500 m	d) 300 m	b)
72	Tri-carboxylic acid cycle occurs in				
	a) chloroplast	b) Mitochondria	c) Cytoplasm	d) Nucleus	b)
73	Which experimental design helps in studying the effects of multiple factors and their interactions on crop yield?				
	a) CRD	b) LSD	c) RBD	d) FRBD	d)
74	Flor proposed the gene-for-gene hypothesis while working on the crop				
	a) Flax	b) Lentil	c) Sesamum	d) Safflower	a)
75	Match the followings				
	A) Recurrent selection		i) Synthetics		
	B) Single seed Descent		ii) RILs		
	C) Backcross		iii) Population improvement		
	D) General Combining ability		iv) NILs		
	a) A-i, B-ii, C-iii, D-iv	b) A-ii, B-i, C-iv, D-iii	c) A-iv, B-iii, C-i, D-ii	d) A-iii, B-ii, C-iv, D-i	d)
76	Assertion (A): Polyploid plants are often sterile. Reason (R): Polyploid changes the chromosome number of plants because of mutation.				
	a) Both (A) and (B) are true and (R) is the correct explanation	b) Both (A) and (B) are true and (R) is not the correct explanation	c) (A) is false but (R) is true	d) (A) is true but (R) is false	b)
77	The main enzyme of C4 plants is				

	a) RuBisco	b) PEP Carboxylase	c) Dehydrogenase	d) Pyruvate carboxylase	b)
78	Which among the following statement is true? i) PDZM-31 is a double zero Indian mustard variety ii) It is a genetically modified mustard variety iii) It has <2% erucic acid and <30 ppm glucosinolates iv) It contains 40-56% oil				
	a) i, ii, iii, iv	b) i, ii, iii	c) i, iii	d) i, iii, iv	d)
79	Identify the dominant marker				
	a) RFLP	b) RAPD	c) SSR	d) SNP	b)
80	A recessive female plant is crossed with a dominant male parent, high frequency of recessive offspring is recovered in the progeny. Such progenies are				
	a) Apomictic	b) heterotic	c) Male sterile	d) Clones	a)
81	What is the role of CRISPR-Cas9 in genome editing?				
	a) CRISPR-Cas9 alters RNA sequences.	b) CRISPR-Cas9 modifies DNA sequences directly	c) CRISPR-Cas9 regulates gene expression post-transcriptionally.	d) CRISPR-Cas9 enables precise editing of specific DNA sequences.	d)
82	What does TILLING stand for in the context of plant breeding?				
	a) Targeting Induced Local Lesions in Genomes	b) Targeted Insertion of Loci for Genetic Engineering	c) Targeted Isolation of Loci through Linkage	d) Targeted Induction of Large Lesions in Genomes	a)
83	The technique used in plant breeding to accelerate the growth and development of plants by manipulating environmental conditions such as light, temperature, and photoperiod is known as				
	a) Shuttle breeding	b) Mutation breeding	c) Speed breeding	d) Precision breeding	c)
84	Which term refers to chemical compounds closely resembling DNA bases?				Answer option (a,b,c or d)
	a) RNA	b) Base analogous	c) Amino Acids	d) Sugars	(b)
85	Which of the following best indicates the absence of linkage in a dihybrid cross?				Answer option (a,b,c or d)
	a) 1:1:1:1 ratio	b) 9:3:3:1 ratio	c) 3:1 ratio	d) 1:2:1 ratio	(a)
86	Which term describes the process of separated or denatured DNA strands reuniting upon cooling?				Answer option (a,b,c or d)
	a) Ligation	b) Amplification	c) Annealing	d) Denaturation	(c)
87	What term describes the situation when dominant alleles of some genes are linked with recessive alleles of other genes on the same chromosome?				Answer option (a,b,c or d)

	a) Codominance	b) Dominance	c) Pleiotropy	d) Linkage	(d)
88	What are mutations called when they arise due to the addition or deletion of nucleotides in mRNA?				Answer option (a,b,c or d)
	a) Frameshift mutations	b) Point mutations	c) Silent mutations	d) Missense mutations	(a)
89	Who were O.T. Avery, C.M. MacLeod, and M. McCarty known for?				Answer option (a,b,c or d)
	a) Discovering the structure of DNA	b) Demonstrating that DNA is the genetic material	c) Inventing the polymerase chain reaction (PCR)	d) Developing the technique of gel electrophoresis	(b)
90	Who constructed the first linkage map?				Answer option (a,b,c or d)
	a) T.H. Morgan	b) A.H. Sturtevant	c) G.J. Mendel	d) T. Schwann	(b)
91	Which enzymes are primarily responsible for the unwinding of complementary strands of DNA during DNA replication?				Answer option (a,b,c or d)
	a) DNA polymerase	b) DNA helicase	c) RNA polymerase	d) Restriction enzymes	(b)
92	Which of the following terms describes DNA sequences found in eukaryotic genomes in the heterochromatic regions of chromosomes?				Answer option (a,b,c or d)
	a) Satellite DNA	b) Nucleosome DNA	c) Exon DNA	d) Intron DNA	(a)
93	Which term describes the linkage between neighboring nucleotides in a DNA molecule?				Answer option (a,b,c or d)
	a) Covalent bonds	b) Phosphodiester bonds	c) Ionic bonds	d) Peptide bonds	(b)
94	Which of the following terms describes the small polynucleotide fragments generated during the replication of the lagging strand?				Answer option (a,b,c or d)
	a) Okazaki fragments	b) Replication bubbles	c) Template strands	d) Primase sequences	(a)
95	Which term describes organisms that have one extra chromosome, resulting in a total of $2n+1$ chromosomes?				Answer option (a,b,c or d)
	a) Monosomy	b) Tetrasomy	c) Trisomy	d) Aneuploidy	(c)
96	What term is used to describe the phenomenon when a segment of a chromosome is oriented in the reverse direction?				Answer option (a,b,c or d)
	a) Duplication	b) Translocation	c) Deletion	d) Inversion	(d)
97	Which organelle is commonly referred to as the "powerhouse of the cell"?				Answer option

					(a,b,c or d)
	a) Nucleus	b) Golgi apparatus	c) Mitochondria	d) Endoplasmic reticulum	(c)
98	What is another term for Meiosis I?				Answer option (a,b,c or d)
	a) Equational Division	b) Reductional Division	c) Somatic Division	d) Binary Fission	(b)
99	When does chiasma terminalisation occur during meiosis?				Answer option (a,b,c or d)
	a) Prophase I	b) Metaphase I	c) Anaphase I	d) Diplotene	(d)
100	Who proposed the theory of linkage?				Answer option (a,b,c or d)
	a) G.J. Mendel	b) T.H. Morgan	c) A. Hershey	d) J. Watson	(b)
101	Who rediscovered Mendel's laws in 1900?				Answer option (a,b,c or d)
	a) Hugo de Vries, Tschermak and Correns	b) G.J. Mendel	c) T.H. Morgan	d) Crick and Watson	(a)
102	Who is often referred to as the "Father of Genetics"?				Answer option (a,b,c or d)
	a) C. Darwin	b) Louis Pasteur	c) G.J. Mendel	d) J. Watson	(c)
103	Who proposed the double helix structure of DNA?				Answer option (a,b,c or d)
	a) J.C. Bose	b) Watson and Crick	c) G.J. Mendel	d) T.H. Morgan	(b)
104	In DNA adenine normally pairs with				Answer option (a,b,c or d)
	a) Uracil	b) Guanine	c) Cytosine	d) Thymine	(d)
105	Which of the following are examples of Allopolyploids?				Answer option (a,b,c or d)
	a) Banana	b) Sugarcane	c) Peanut	d) Wheat	(d)
106	Which of the following plants does not exhibit Autotetraploids?				Answer option (a,b,c or d)
	a) Rye	b) Alfalfa	c) Brachiaria grass	d) Durum wheat	(d)
107	Natural autopolyploids include which of the following plants?				Answer option (a,b,c or d)

	a) Cotton	b) Tobacco	c) Mustard	d) Wheat	(b)
108	Trisomy occurs in which of the following plant?				Answer option (a,b,c or d)
	a) Barley	b) Watermelon	c) Tomato	d) Sugarcane	(a)
109	Which chemical reagent is commonly used for inducing polyploidy?				Answer option (a,b,c or d)
	a) Colchicine	b) Ethanol	c) Hydrogen peroxide	d) Nitrogen	(a)
110	Which of the following plants are Dioecious?				Answer option (a,b,c or d)
	a) Papaya	b) Date palm	c) Both A and B	d) Wheat	(c)
111	Who are credited with the formulation of the cell theory?				Answer option (a,b,c or d)
	a) Schleiden and Schwann	b) Sutton & Boveri	c) Correns, de Vries & Tschermak	d) Farmer and Moore	(a)
112	Who proposed the chromosome theory of inheritance?				Answer option (a,b,c or d)
	a) Schleiden and Schwann	b) Sutton & Boveri	c) Correns, de Vries & Tschermak	d) Farmer and Moore	(b)
113	Who provided cytological proof for crossing over in maize?				Answer option (a,b,c or d)
	a) Bateson and Punnet	b) Blakeslee and Belling	c) Creighton and McClintock	d) Knoll and Ruska	(c)
114	Who provided experimental proof of DNA as the genetic material?				Answer option (a,b,c or d)
	a) Avery, MacLeod & McCarty	b) Auerbach and Robson	c) Hershey and Chase	d) Robinson and Brown	(c)
115	Who induced mutations in <i>Drosophila</i> using chemicals?				Answer option (a,b,c or d)
	a) Auerbach and Robson	b) McFadden, Sears & Kihara	c) Robinson and Brown	d) Blakeslee and Belling	(a)
116	Who synthesized <i>Triticum spelta</i> ?				Answer option (a,b,c or d)
	a) Auerbach and Robson	b) McFadden, Sears & Kihara	c) Robinson and Brown	d) Blakeslee and Belling	(b)
117	Match the following				
	A. UUU	I Glycine			

	B. CCC	II Lysine	Answer		
	C. AAA	III Proline	option		
	D. GGG	IV Phenylalanine	(a,b,c or d))		
	a) A-III B-IV C-I D-II	b) A-IV B-III C-II D-I	c) A-I B-II C- IV D-III	d) A-II B-III C-IV D-I	(b)
118	Match the following				Answer
	A. BB × bb	I 100% bb		(a,b,c or d)	
	B. Bb × Bb	II 25% BB, 50% Bb, 25% bb			
	C. BB × BB	III 100% BB			
	D. bb × bb	IV 100% Bb			
	a) A-II B-I C- III D-IV	b) A-IV B-II C-III D-I	c) A-I B-III C- II D-IV	d) A-I B-II C- IV D-III	(b)
119	Match the following				Answer
	A. Genetics	I Monoploid		(a,b,c or d)	
	B. Check board	II Heredity and variation			
	C. Haploid	III Punnet			
	D. Allele	IV Alternative form of gene			
	a) A-II B-III C- I D-IV	b) A-III B-II C-I D-IV	c) A-I B-III C- II D-IV	d) A-IV B-I C- II D-III	(a)
120	Match the following				Answer
	A. Inhibitory gene	I 9:3:4		(a,b,c or d)	
	B. Complementary gene	II 1:1:1:1			
	C. Recessive epistasis	III 12:3:1			
	D. Dihybrid test cross	IV 9:7			
	E. Dominant epistasis	V 13:3			
	a) A-V B-IV C-III D-II E-I	b) A-IV B-V C-I D-II E-III	c) A-I B-II C- IV D-III E-V	d) A-V B-IV C-I D-II E-III	(b)
121	Match the following				Answer
	A. Primase	I Polynucleotide fragments joined		(a,b,c or d)	
	B. Ligase	II Synthesizing the primer			
	C. RNA replicase	III DNA is synthesized from RNA			
	D. Reverse transcriptase	IV RNA produces new copies of itself			
	a) A-II B-I C- IV D-III	b) A-III B-II C-I D-IV	c) A-I B-III C- II D-IV	d) A-I B-II C- IV D-III	(a)
122	Match the following				Answer
	A. Queen of genetics	I Power house of cell		(a,b,c or d)	
	B. Satellite DNA	II Supernumery chromosomes			
	C. Mitochondria	III Nuclear organizer region			
	D. B-chromosomes	IV Drosophila			
	a) A-IV B-III C-I D-II	b) A-III B-II C-I D-IV	c) A-I B-III C- II D-IV	d) A-I B-II C- IV D-III	(a)
123	Match the following				Answer
	A. Plastids	I Cellular respiration		(a,b,c or d)	
	B. Mitochondria	II Storage and synthesis the food material			
	C. Endoplasmic reticulum	III Packing of food material			

	D. Golgi bodies	IV Photosynthesis			
	a) A-IV B-III C-I D-II	b) A-III B-II C-I D-IV	c) A-IV B-I C- II D-III	d) A-I B-II C- IV D-III	(c)
124	Match the following				Answer option
	A. Metaphase –II	I Synthesis of Protein			(a,b,c or d)
	B. S Phase	II Disjunction			
	C. G2 Phase	III DNA Replications			
	D. Anaphase-I	IV Auto-Orientation			
	a) A-III B-II C- I D-IV	b) A-I B-II C- IV D-III	c) A-IV B-III C-I D-II	d) A-IV B-I C- II D-III	(c)
125	Match the following				Answer option
	A. Incomplete dominance	I <i>Mirabilis jalapa</i>			(a,b,c or d)
	B. Co-dominance	II Colour blindness in human beings			
	C. Over dominance	III Coat colour of short horned breed of cattle			
	D. Pseudo-dominance	IV White eye gene (W) of <i>Drosophila</i>			
	a) A-III B-II C- I D-IV	b) A-I B-III C- IV D-II	c) A-IV B-III C-I D-II	d) A-IV B-I C- II D-III	(a)
126	Match the following				Answer option
	A. Nilsson-Ehle	I Epitasis			(a,b,c or d)
	B. Bateson	II Lethal genes affecting coat colour in mice			
	C. Johanssen	III Multiple factor hypothesis			
	D. Cuenot	IV Genotype and Phenotype			
	a) A-III B-I C- IV D-II	b) A-III B-II C-I D-IV	c) A-IV B-I C- II D-III	d) A-I B-II C- IV D-III	(a)
127	Match the following				Answer option
	A. Autotetraploid	I AABBCCDD			(a,b,c or d)
	B. Allotetraploid/Amphidiploid	II AABB			
	C. Allohexaploid	III AAAA			
	D. Allooctaploid	IV AABBCC			
	a) A-IV B-III C-I D-II	b) A-III B-II C-IV D-I	c) A-I B-III C- II D-IV	d) A-I B-II C- IV D-III	(b)
128	Match the following				Answer option
	A. XX – XO sex determination	I <i>Drosophila</i> and human beings			(a,b,c or d)
	B. XX – XY sex determination	II Fishes, reptiles and birds			
	C. ZO – ZZ sex determination	III Hemiptera and Orthoptera			
	D. ZW – ZZ sex determination	IV Moths and butterflies			
	a) A-II B-I C- III D-IV	b) A-III B-I C- IV D-II	c) A-I B-III C- II D-IV	d) A-I B-II C- IV D-III	(b)
129	Match the following				Answer option
	A. Leptotene	I Crossing Over			(a,b,c or d)
	B. Zygotene	II Chiasmata/Terminalization			
	C. Pachytene	III Chromomeres			
	D. Diplotene	IV Synapsis/Synaptonemal Complex			
	a) A-III B-II C- I D-IV	b) A-I B-III C- IV D-II	c) A-III B-IV C-I D-II	d) A-IV B-I C- II D-III	(c)

130	Match the following				Answer option (a,b,c or d)
	A. Duplications	I Hemophilia, Colourblind			
	B. Complete linkage	II Bar eye in Drosophila			
	C. Pseudoalleles	III Male Drosophila, female silkworm			
	D. Sex linked disease	IV Lozenge eye in Drosophila			
	a) A-II B-III C-I D-IV	b) A-III B-IV C-II C-I	c) A-II B-III C-IV D-I	d) A-IV B-I C-II D-III	(c)
131	Which of the following statements is true regarding the “law of segregation”? A. Alleles of a gene separate from each other during gamete formation. B. Homozygous individuals always produce heterozygous offspring. C. The law only applies to genes located on different chromosomes. D. The law was proposed by Gregor Mendel in his experiments with pea plants.				Answer option (a,b,c or d)
	a) A and D	b) A and B	c) B and D	d) C and D	
132	Which of the following statements is false regarding the “9:7 ratio in the F ₂ generation”? A. The 9:7 ratio in the F ₂ generation indicates complete dominance with a complementary gene interaction. B. It is observed when two genes are involved in the determination of a single trait. C. The 9:7 ratio in the F ₂ generation indicates incomplete dominance. D. It is commonly observed in Mendelian genetics experiments involving pea plants.				Answer option (a,b,c or d)
	a) A and C	b) A and D	c) B and D	d) C and D	
133	Which of the following statements is true regarding the “Non-ionizing radiations”? A. Non-ionizing radiations have enough energy to remove tightly bound electrons from atoms, causing ionization. B. Examples of non-ionizing radiations include visible light, radio waves, and microwaves. C. Non-ionizing radiations are generally considered to be harmful to human health. D. These radiations have lower energy levels compared to ionizing radiations like X-rays and gamma rays.				Answer option (a,b,c or d)
	a) A and C	b) B and D	c) C and D	d) A and B	
134	Which of the following statements is true regarding the “Mitochondrial inheritance”? A. Mitochondrial inheritance is passed down exclusively from the mother to all her offspring. B. Mitochondrial DNA is inherited from both parents. C. Diseases caused by mutations in mitochondrial DNA follow Mendelian inheritance patterns. D. Mitochondrial inheritance is linked to the sex chromosomes.				Answer option (a,b,c or d)
	a) A and D	b) C and D	c) Only A	d) A and B	
135	Which of the following statements are false regarding the “Dioecious plants”? A. Dioecious plants have both male and female reproductive organs on the same individual.				Answer option (a,b,c or d)

	B. Each individual plant in a dioecious species typically produces both pollen and ovules. C. Dioecious plants require cross-pollination between male and female individuals for reproduction. D. Examples of dioecious plants include kiwi, papaya, and date palm trees.	
	a) A and B b) A and D c) A and C d) C and D	(a)
136	Which of the following statements is false regarding the “DNA gyrase and DNA helicase”? A. Unwinding the DNA double helix. B. Synthesizing new DNA strands. C. Requiring energy (ATP) to function. D. Being the sole enzyme responsible for DNA replication.	Answer option (a,b,c or d)
	a) A and C b) B and D c) C and D d) A and D	(b)
137	Which of the following statements is true regarding the “Reverse transcriptase”? A. Only functions in eukaryotic cells. B. Violates the central dogma of molecular biology. C. Synthesizes both DNA and RNA. D. Plays a crucial role in the replication of some viruses.	Answer option (a,b,c or d)
	a) A and C b) A and D c) B and D d) C and D	(c)
138	Which of the following statements is false regarding the “Drosophila melanogaster”? A. It has the most complex genome studied by scientists. B. Its short life cycle allows for rapid observation of multiple generations. C. It possesses unique genetic traits not found in other organisms. D. The principles discovered through its genetics research apply widely.	Answer option (a,b,c or d)
	a) A and C b) A and D c) B and D d) C and D	(a)
139	Which of the following statements is true regarding the “Okazaki fragments”? A. Long, continuous stretches of DNA synthesized on the leading strand. B. Short, discontinuous segments of DNA formed on the lagging strand. C. Joined together by the enzyme DNA ligase to form a complete strand. D. Synthesized independently without requiring other enzymes.	Answer option (a,b,c or d)
	a) A and B b) A and D c) B and C d) C and D	(c)
140	Which of the following statements is false regarding the “crossing over”? A. It directly leads to the creation of new genes. B. It increases genetic diversity in offspring. C. The frequency of crossing over can be influenced by the distance between genes. D. It occurs with a frequency exceeding 50% on average	Answer option (a,b,c or d)
	a) A and C b) A and D c) B and D d) C and D	(b)
141	Which of the following statements is false regarding the “AUG codon”? A. Stop codon, signaling the termination of protein synthesis. B. Start codon, initiating protein translation on mRNA.	Answer option (a,b,c or d)

	C. Most common codon for the amino acid methionine in eukaryotes. D. The only codon that can initiate protein translation.	
	a) A and B b) A and C c) A and D d) C and D	(d)
142	Which of the following statements is false regarding the “Deletions”? A. Adding extra nucleotides to a specific location. B. Losing a small number of nucleotides within a gene. C. Removing an entire gene or even several neighboring genes. D. Always resulting in beneficial mutations for the organism.	Answer option (a,b,c or d)
	a) A and C b) A and B c) B and C d) A and D	(d)
143	Which of the following statements is true regarding the “Molecular markers”? A. Morphological features readily observable without special equipment. B. Specific DNA sequences used to identify variations within a population. C. Always directly linked to a specific gene or trait of interest. D. Detectable through laboratory techniques like gel electrophoresis.	Answer option (a,b,c or d)
	a) A and C b) A and B c) B and C d) B and D	(d)
144	Which of the following statements is true regarding the “QTL mapping”? A. Identify the exact sequence of nucleotides responsible for a particular trait. B. QTLs associated with variation in a quantitative trait. C. Guarantee the successful isolation and cloning of the genes involved. D. Analyze how genes interact with environmental factors to influence a trait.	Answer option (a,b,c or d)
	a) A and C b) B and D c) C and D d) A and B	(b)
145	What's false about the process of PCR? A. It can only amplify DNA segments smaller than 100 base pairs in length. B. Each cycle of PCR exponentially increases the amount of the target DNA segment. C. The technique is error-free and guarantees perfect copies of the target DNA. D. It relies on the principle of complementary base pairing between DNA strands.	Answer option (a,b,c or d)
	a) A and C b) B and D c) C and D d) A and D	(a)
146	What's true about the Mendel? A. Discovery of the double helix structure of DNA. B. Pioneering experiments on pea plants that laid the foundation of modern genetics. C. Development of the theory of natural selection alongside Charles Darwin. D. Work on deciphering the human genome.	Answer option (a,b,c or d)
	a) A and D b) A and B c) B and C d) Only B	(d)
147	What's false about the R.A. Fisher's? A. Discovering the structure of DNA, the genetic material. B. Pioneering statistical methods widely used in scientific research today.	Answer option (a,b,c or d)

	C. Founding the field of population genetics alongside Sewall Wright and J. B. S. Haldane. D. Developing the theory of natural selection with Charles Darwin.				
	a) A and B	b) B and D	c) A and C	d) A and D	(d)
148	Given below are the two statements; one labelled as Assertion (A) and other labelled as Justification (J): Assertion (A): Holandric genes are located on the Y chromosome. Justification (J): Holandric genes are inherited exclusively from fathers to sons.				Answer option (a,b,c or d)
	a) Both A and J are correct and J is the correct explanation for A.	b) Both A and J are correct but J is not the correct explanation for Assertion	c) A is correct but J is incorrect	d) Both A and J are incorrect	(a)
149	Given below are the two statements; one labelled as Assertion (A) and other labelled as Justification (J) : Assertion (A) : Crossing over occurs during prophase II of meiosis. Justification (J) : Crossing over increases genetic diversity by exchanging genetic material between homologous chromosomes.				Answer option (a,b,c or d)
	a) A is true and J is incorrect	b) A is incorrect and J is true	c) A is true and J is true and is a correct explanation for A.	d) A is true and J is true but is an incorrect explanation for A.	(b)
150	Given below are the two statements; one labelled as Assertion (A) and other labelled as Justification (J): Assertion (A): Inbreeding amplifies homozygosity, unveiling deleterious recessive genes, leading to their elimination through selection. Justification (J): Persistent inbreeding diminishes fertility and productivity.				Answer option (a,b,c or d)
	a) Both A and J are true but J is an incorrect explanation for A	b) A is true but J is incorrect	c) Both A and J are incorrect	d) Both A and J are true and J is the true explanation for A	(d)