

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 SOIL SCIENCE AND
AGRICULTURAL CHEMISTRY

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 principles is fundamental to research ethics? A) Expediency B) Fairness C) Honesty				a

	D) Competition E) Profitability Choose the correct answer from the option given below:				
	a) C only	b) A, B & E	c) D & E	d) B & D	a) Honesty
22	What is the significance of peer review in scientific research?				c
	a) It ensures that only positive results are published	b) It guarantees funding for research projects	c) It helps ensure the quality and integrity of research findings.	d) It speeds up the publication process.	c) It helps ensure the quality and integrity of research findings.
23	Which of the following is NOT an example of research misconduct?				a
	a) Properly citing sources in a research paper	b) Manipulating research data to fit a desired outcome	c) Plagiarizing another researcher's work	d) Fabricating research findings	a) Properly citing sources in a research paper
24	Which principle requires researchers to disclose any conflicts of interest that may influence their research? A) Transparency B) Profitability C) Expediency D) Exclusivity E) Accessibility Choose the correct answer from the option given below:				a
	a) A only	b) B & E	c) C & D	d) B & C	a) Transparency
25	How are traditional knowledge systems being integrated into modern soil science research?				b
	a) By developing advanced soil sampling techniques	b) By incorporating indigenous soil management practices	c) By introducing genetically modified soil microorganisms	d) By implementing high-throughput sequencing technologies	b) By incorporating indigenous soil management practices
26	Which of the following actions is considered a form of research misconduct?				b
	a) Acknowledging funding sources in published papers	b) Selectively reporting only favorable research results	c) Collaborating with colleagues from different institutions	d) Sharing raw data with other researchers	b) Selectively reporting only favorable research results
27	Which journal is known for its research on soil erosion, soil conservation, and sustainable land use practices?				c
	a) Geoderma	b) Journal of Hydrology	c) Journal of Soil and Water Conservation	d) Pedosphere	c) Journal of Soil and Water Conservation
28	What does UGC CARE stand for?				b
	a) University Grants	b) University Grants	c) University Grants	d) University Grants	b) University Grants

	Commission Consortium for Academic Research and Excellence	Commission Consortium for Academic and Research Ethics	Commission Consortium for Academic Rigor and Evaluation	Commission Consortium for Academic Resources and Excellence	Commission Consortium for Academic and Research Ethics
29	How often is the UGC CARE List updated?				a
	a) Annually	b) Biannually	c) Quarterly	d) Once every two years	a) Annually
30	Which of the following types of publications are eligible for inclusion in the UGC CARE List? A) Journals B) Report C) Books D) Conference proceedings E) Monographs Choose the correct answer from the option given below:				c
	a) A only	b) B & E	c) A & D	d) B& C	c) Journals and conference proceedings
31	What does NAAS stand for in the context of agricultural sciences?				a
	a) National Academy of Agricultural Sciences	b) National Association of Agricultural Societies	c) National Academy of Agricultural Systems	d) National Association of Agricultural Scholars	a) National Academy of Agricultural Sciences
32	Given below are two statement: one is labelled as Assertion A and the other is labelled as Reason R: Assertion A: Journals with higher NAAS ratings are deemed to possess superior scholarly quality and impact. Reason R: The NAAS rating system evaluates journals based on various parameters such as citation index, editorial quality, and academic rigor. In the light of above statement, choose the most appropriate one.				c
	a) A is false and R is true	b) Both are false	c) Both are true	d) R is false and A is true	c) Both are true
33	What is potential conflict of interest in research? A) A situation where researchers intentionally fabricate data to support a particular outcome B) A scenario where researchers have financial or personal interests that may influence their research findings C) A condition where researchers collaborate with other institutions to ensure impartiality D) A state where researchers have no external affiliations or biases E) A condition where researchers prioritize ethical considerations over research outcomes Choose the correct answer from the option given below:				d
	a) A only	b) A & E	c) C & D	d) B only	d) A scenario where researchers have financial or personal

					interests that may influence their research findings
34	Which of the following actions is considered unethical in research?				c
	a) Conducting experiments without proper training	b) Seeking feedback from colleagues on research protocols	c) Using research funds for personal expenses	d) Acknowledging contributions from collaborators	c) Using research funds for personal expenses
35	What is the primary purpose of blinding in research work?				b
	a) To ensure that participants are aware of the researcher's identity	b) To prevent researchers from knowing which group participants belong to	c) To increase the cost of research studies	d) To reduce the number of participants in a study	b) To prevent researchers from knowing which group participants belong to
36	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
37	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
38	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
39	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
40	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

41	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
42	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
43	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
44	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
45	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
46	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
47	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
48	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
49	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

50	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												
51	Kaolinite is a most common				Answer												
	a) 1:1 clay	b) 2:2 clay	a) 2:1 clay	b) 2:2 clay	a) 1:1 clay												
52	<p>Given below are two statement: one is labelled as Assertion (A) and the other is labelled as justification (B):</p> <p>Assertion (A): Cation replacement in minerals is called cation exchange capacity.</p> <p>Justification (B): Cation exchange capacity refers to the ability of soil minerals to retain and exchange positively charged ions (cations) such as calcium, magnesium and potassium.</p> <p>In the light of above statement, choose the most appropriate one.</p>																
	a) Both the A and B are true, and the Justification is the correct explanation of the assertion	b) Both the A and B are true, but the Justification is not the correct explanation of the assertion	c) The assertion is true, but the Justification is false	d) The assertion is false, but the Justification is true	a) Both the A and B are true, and the Justification is the correct explanation of the assertion												
53	<p>Match List-I with List-II and select the correct answer using the code given below the lists:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">List - I (Micro-organisms)</th> <th style="width: 50%;">List - II (Functions)</th> </tr> </thead> <tbody> <tr> <td>A. <i>Nitrobacter</i></td> <td>1. Conversion of $\text{NH}_4\text{-N}$ to $\text{NO}_2\text{-N}$</td> </tr> <tr> <td>B. <i>Nitrosomonas</i></td> <td>2. Hydrolysis of urea</td> </tr> <tr> <td>C. <i>Clostridium</i></td> <td>3. Oxidation of sulfur</td> </tr> <tr> <td>D. <i>Thiobacillus</i></td> <td>4. Conversion of $\text{NO}_2\text{-N}$ to $\text{NO}_3\text{-N}$</td> </tr> <tr> <td></td> <td>5. Asymbiotic fixation of nitrogen</td> </tr> </tbody> </table>				List - I (Micro-organisms)	List - II (Functions)	A. <i>Nitrobacter</i>	1. Conversion of $\text{NH}_4\text{-N}$ to $\text{NO}_2\text{-N}$	B. <i>Nitrosomonas</i>	2. Hydrolysis of urea	C. <i>Clostridium</i>	3. Oxidation of sulfur	D. <i>Thiobacillus</i>	4. Conversion of $\text{NO}_2\text{-N}$ to $\text{NO}_3\text{-N}$		5. Asymbiotic fixation of nitrogen	
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	a) A-5, B-3, C-2, D-1	b) A-4, B-3, C-5, D-1	c) A-4, B-1, C-5, D-3	d) A-5, B-1, C-2, D-3	e) A-4, B-1, C-5, D-3												
54	<p>For a low rating of nutrient in soil:</p> <p>A. For Nitrogen: < 280 kg N/ha B. For Phosphorus: < 10 kg P/ha C. For Potassium: < 108 kg K/ha</p> <p>Choose the true statement from the options given below:</p>																
	a) A, B, C only	b) B only	c) A only	d) A, B only	a) A, B, C only												
55	The cation exchange capacity (CEC) in soil is expressed as																
	a) meq /100g soil	b) geqv. /100 g soil	c) % eqv. /100 g soil	d) 0/00	a) meq /100g soil												
56	Given below are two statement: one is labelled as Assertion (A) and the other is labelled as Justification (B):																

	<p>Assertion (A): pH of any solution can be affected by the temperature</p> <p>Justification (B): Negative logarithm of hydrogen ion activity is called pH. So, increasing temperature increased the activity of ions; similarly, decreasing temperature also decreased the activity. So, temperature affects the pH.</p> <p>In the light of above statement, choose the most appropriate one.</p>																
	a) Both the A and B are true, and the Justification is the correct explanation of the assertion	b) Both the A and B are true, but the Justification is not the correct explanation of the assertion	c) The assertion is true, but the Justification is false	d) The assertion is false, but the Justification is true	a) Both the A and B are true, and the Justification is the correct explanation of the assertion												
57	<p>Match List-I with List-II and select the correct answer using the code given below the lists:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">List - I (Micronutrient)</th> <th style="width: 50%;">List - II (Mineral)</th> </tr> </thead> <tbody> <tr> <td>A. <i>Zn</i></td> <td>1. Wulfenite</td> </tr> <tr> <td>B. <i>Mo</i></td> <td>2. Pyrite</td> </tr> <tr> <td>C. <i>Cu</i></td> <td>3. Smithsonite</td> </tr> <tr> <td>D. <i>Mn</i></td> <td>4. Malachit</td> </tr> <tr> <td></td> <td>5. Pyrolusite</td> </tr> </tbody> </table>				List - I (Micronutrient)	List - II (Mineral)	A. <i>Zn</i>	1. Wulfenite	B. <i>Mo</i>	2. Pyrite	C. <i>Cu</i>	3. Smithsonite	D. <i>Mn</i>	4. Malachit		5. Pyrolusite	
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	a) A-2, B-1, C-4, D-3	b) A-3, B-1, C-4, D-5	c) A-2, B-4, C-1, D-3	d) A-3, B-4, C-1, D-5	b) A-3, B-1, C-4, D-5												
58	<p>The reason of use of orthophosphoric acid in wet oxidation of organic carbon in soil is</p> <p>A. As indicator B. Takes part in digestion process C. To sharpen the end point during titration D. Helps in evaporation of soil C as CO₂</p> <p>Choose the true statement from the options given below:</p>																
	a) A, B, C only	b) B only	c) C only	d) A, B only	c) C only												
59	<p>K fixation is higher in</p>																
	a) 1:1 clay minerals	b) 2:1 clay minerals	c) 2:2 clay minerals	d) 1:2 clay minerals	b) 2:1 clay minerals												
60	<p>The term p^H was introduced by</p>																
	a) Daniel Hillel	b) N. C. Brady	c) Sorenson	d) M. L. Jackson	c) Sorenson												
61	<p>Buffering capacity of soil is mainly contributed by</p>																
	a) Minerals	b) Clay	c) Humus and clay	d) Cations and anions	c) Humus and clay												
62	<p>Under USDA system of soil classification (Soil Taxonomy), soils of the world are classified into</p>																
	a) 12 orders	b) 14 orders	c) 10 orders	d) 11 orders	a) 12 orders												
63	<p>? = (Exchangeable Na/CEC) × 100</p>																
	a) Effective CEC	b) Buffering capacity	c) Exchangeable sodium percentage	d) Exchangeable base	c) Exchangeable sodium percentage												

64	Dilution of 100 ml of a solution having p^H 7.0 with pure water to 1000 ml will				
	a) Change the pH of the solution	b) Increase the pH of the solution	c) Decrease the pH of the solution	d) Not change the pH of the solution	d) Not change the pH of the solution
65	In general, the C:N ratio of mineral soils varies between				
	a) 6-8	b) 10-12	c) 13-15	d) 15-20	b) 10-12
66	<p>Given below are two statement: one is labelled as Assertion (A) and the other is labelled as Justification (B):</p> <p>Assertion (A): Potassium (K) fixation is the conversion of the available form of K to bio-available form</p> <p>Justification (B): K ions can enter the interlayer space of Al octahedral and Si tetrahedral sheets of clay minerals and become trapped inside. Therefore, the highest fixation can be observed in montmorillonite compared to kaolinite clay-dominant soils.</p> <p>In the light of above statement, choose the most appropriate one.</p>				
	a) Both the A and B are true, and the Justification is the correct explanation of the assertion	b) Both the A and B are true, but the Justification is not the correct explanation of the assertion	c) only B is correct	d) The assertion is false, but the Justification is true	c)
67	Soil developed from river deposits is called				
	a) Colluvial soil	b) Alluvial Soil	c) Lateritic soil	d) Vertisol	b) Alluvial Soil
68	The amount of water in soil released between field capacity and the permanent wilting point is called				
	a) Unavailable water	b) Capillary water	c) Available water	d) Hygroscopic water	c) Available water
69	Soil compaction and the bulk density of soil maintains				
	a) Positive correlation	b) Negative correlation	c) No relation	d) Asymptote relation	a) Positive correlation
70	Darcy's law is used to explain the flow of				
	a) Gases in soil	b) Elements in soil	c) Water in soil	d) Colloids in soil	c) Water in soil
71	Montmorillonite istype of clay mineral.				
	a) 1:1	b) 2:1	c) Amorphous	d) 2:1:1	b) 2:1
72	The concentration of CO_2 in soil pores is approximatelytimes higher than the concentration in air				
	a) 5	b) 8	c) 12	d) 10	d) 10
73	<p>Association of two microorganisms in which one is benefitted while other remains unaffected is known as</p> <p>A. Commensalism B. Proto-cooperation C. Ammensalism D. Competition</p> <p>Choose the true statement from the options given below:</p>				
	a) A only	b) B only	c) C only	d) A, B & C	a) A only

74	Which type of the arbuscular mycorrhizal fungi produces both arbuscles and vesicles				
	a) Ecto-mycorrhizae type	b) Arbutoid type	c) Arum type	d) Paris type	d) Paris type
75	Select the incorrectly matched pair in the following:				
	List - I (Microbial Process)		List - II (Micro-organism)		
	1	Nitrification	<i>Nitrosomonas, Nitrobacter</i>		
	2	Denitrification	<i>Bacillus, Pseudomonas</i>		
	3	Non-symbiotic nitrogen fixation	<i>Clostridium, Azotobacter</i>		
	4	Symbiotic nitrogen fixation	<i>Thiobacillus</i>		
	a) only 4	b) 2 and 4	c) only 2	d) 2, 3 and 4	a) only 4
76	<i>Azolla</i> and its cyanobacterial microsymbionts, <i>Anabaena azollae</i> is an example of				
	a) Phototrophic symbiotic N ₂ -fixation	b) Non-phototrophic symbiotic N ₂ -fixation	c) Associative symbiotic N ₂ -fixation	d) Phototrophic non-symbiotic N ₂ -fixation	a) Phototrophic symbiotic N ₂ -fixation
77	Soil bacterial population that exhibits a low specific growth rate but high substrate affinity is called as				
	a) Autochthony	b) Zymogeny	c) Free living	d) Symbiosis	a) Autochthony
78	SO ₄ ²⁻ reaches roots by				
	a) Diffusion	b) Mass flow	c) Diffusion and mass-flow	d) Oxidation	c) Diffusion and mass-flow
79	The secondary macronutrients are				
	a) S, Fe and Mg	b) N, P and K	c) S, Ca and Mg	d) B, Mo and Zn	c) S, Ca and Mg
80	<p><i>NifH</i> and <i>nifD</i> genes are involved in which process</p> <p>A. Recognition of host plant by rhizobia B. Root hair curling of host plants C. N₂-fixation D. K fixation</p> <p>Choose the true statement from the options given below:</p>				
	a) A, B, C only	b) A only	c) C only	d) A, B only	b) A only
81	Who is regarded as founder of soil microbiology				
	a) S. Winogradsky	b) M. Alexander	c) M. Beijerinck	d) Hellriegel	a) S. Winogradsky
82	The basic difference between archaea and bacteria prokaryotes is				
	a) Presence and absence of cell wall	b) Presence and absence of cell nucleus	c) Presence and absence of cell wall murein	d) Presence and absence of plasmid	c) Presence and absence of cell wall murein
83	Who first used the Latin term " <i>Humus</i> "				
	a) Wallerius (1753)	b) De Saussure (1804)	c) Berzelius (1808)	d) Berzelius (1834)	a) Wallerius (1753)

84	In the phylogeny based classification “The Tree of Life” the tip of each branch within the domain bacteria represents				
	a) Order	b) Sub-branch	c) Phylum	d) Genus	c) Phylum
85	Protista includes				
	a) Unicellular protozoa, algae and fungi	b) Unicellular bacteria, archaea, and fungi	c) Unicellular archaea and bacteria	d) None of the above	c) Unicellular archaea and bacteria
86	Bacteria those utilise CO ₂ as a sole source of carbon for growth and obtain energy from the oxidation of inorganic compounds are called				
	a) Lithoautotrophs	b) Photoautotrophs	c) Heterotrophs	d) Photoheterotrophs	a) Lithoautotrophs
87	Who first isolated bacteria that he called <i>Bacillus radicum</i> (now usually called as <i>Rhizobium</i>)				
	a) Martinus Beijerinck	b) S. Winogradsky	c) Martin Alexander	d) N.S. SubbaRao	a) Martinus Beijerinck
88	Waksman received the 1952 Nobel Prize in Medicine for discovery				
	a) Penicillin and Streptomycin	b) Rifampicin and Gentamycin	c) Chloramphenicol	d) DDT	a) Penicillin and Streptomycin
89	Say, the recommended dose of N for rice crop is 50 kg/ha and the N content of an organic manure is 2.5%. How much quantity of organic manure is required to apply in a rice field of an area 5000 square meter				
	a) 2 tonne	b) 1 tonne	c) 3 tonne	d) 5 tonne	b) 1 tonne
90	A bacterial broth medium was inoculated with 10 cells of a bacterium. After 66 minute of incubation number of cells was 100. What is the generation time for this bacterium				
	a) 100 min	b) 20 min	c) 10 min.	d) 30 min.	c) 10 min
91	Which one of the soil fauna is “Ecosystem Engineer”				
	a) Protozoa	b) Nematode	c) Earthworm	d) Collembolan	c) Earthworm
92	Cation and anion exchange in soils occurs on surfaces of				
	a) Only clay minerals	b) Inorganic compounds	c) OM and roots	d) clay minerals and organic matter	d) Clay minerals and organic matter
93	Industrial N ₂ fixation is based on Haber-Bosch process, which operates under the condition				
	a) 551 ⁰ C, 500 atm	b) 1200 ⁰ C, 100 atm	c) 551 ⁰ C, 1000 atm	d) 1200 ⁰ C, 500 atm	d) 1200 ⁰ C, 500 atm
94	In organic soils, what percentage of total N in surface soils is organic N				
	a) 90%	b) 99%	c) 95%	d) None of the above	c) 95%
95	Match List-I with List-II and select the correct answer using the code given below the lists:				
	List - I (Soil Order)		List - II (Main Characteristic)		
	A. Entisols		1. Presence of Argillic horizon		
	B. Inceptisols		2. Not found in India		
	C. Alfisols		3. Dominant in North East India		
	D. Andisols		4. Found all states of India		

	a) A-4, B-3, C-2, D-1	b) A-4, B-3, C-1, D-2	c) A-4, B-3, C-1, D-2	d) A-3, B-2, C-4, D-1	b) A-4, B-3, C-1, D-2
96	In general soil solution phase K ranges from A. 5,000-25,000ppm B. 1-10 ppm C. 50-750 ppm D. 1-100 ppm Choose the true statement from the options given below:				
	a) B only	b) A only	c) C only	d) A, B only	a) B only
97	Given below are two statement: one is labelled as Assertion (A) and the other is labelled as Justification (B): Assertion (A): Phosphorus (P) fixation is higher in acidic soil compared to neutral soil. Justification (B): P is fixed by phosphate solubilization bacteria, so lower fixation is observed in acidic soil compared to neutral soil because bacterial activity is lower in acidic conditions.				
	a) Both the A and B are true, and the Justification is the correct explanation of the assertion	b) Both the A and B are true, but the Justification is not the correct explanation of the assertion	c) The assertion is true, but the Justification is false	d) The assertion is false, but the Justification is true	c) The assertion is true, but the Justification is false
98	Electrical conductivity of saline soil is				
	a) Lesser than sodic soil	b) Greater than sodic soil	c) Equal to sodic soil	d) Lesser than acidic soil	b) Greater than sodic soil
99	Mica is a				
	a) Inosilicate	b) Phyllosilicate	c) Tectosilicate	d) Ino- plus tecto-silicate	b) Phyllosilicate
100	Hartig net is formed by Ectomycorrhizal fungi including				
	a) Arbutoid and monotropoid	b) Yeast	c) Blue green algae	d) Arbuscular mycorrhizal fungi	a) Arbutoid and monotropoid
101	N immobilization occurs in soils if the C:N ratio of the organic residues applied in soil				
	a) <20:1	b) > 20:1	c) <10:1	d) > 10:1 but < 20:1	b) > 20:1
102	Luxurious consumption in plant related with: A) N B) P C) K D) Ca E) Mg Choose the correct answer from the option given below				
	a) A, B, E only	b) C only	c) E only	d) D,E only	b) K

10 3	<p>Given below are two statement: one is labelled as Assertion A and the other is labelled as Reason R:</p> <p>Assertion A: A tri-acid mixture composed of HNO₃, H₂SO₄, and HClO₄</p> <p>Reason R: Despite the versatility of the tri-acid mixture, handling and storage require careful attention due to the highly corrosive nature of the individual acids, posing significant safety risks and necessitating proper safety protocols and equipment.</p> <p>In the light of above statement, choose the most appropriate one.</p>				
	a) A is false and R is true	b) Both are true	c) Both are false	d) R is false and A is true	b) Both are true
10 4	Which of the following anion is not strongly adsorbed to AEC in soil				
	a) H ₂ PO ₄ ⁻	b) SO ₄ ⁻	c) NO ₃ ⁻	d) Cl ⁻	c) NO ₃ ⁻
10 5	Average C:N:P:S ratio in soil is				
	a) 100:50:30:1	b) 140:10:1.3:1.3	c) 100:10:1.3:1.3	d) 140:10:2.5:1.5	d) 140:10:2.5:1.5
10 6	<p>Equivalent acidity of ammonium sulphate is</p> <p>A) 80 B) 128 C) 86 D) 56 E) 110</p> <p>Choose the correct answer from the option given below</p>				
	a) A, B, E only	b) C only	c) E only	d) E only	d) 110
10 7	The DTPA extractant for micronutrients is designed to avoid excessive dissolution of				
	a) CaO	b) CuSO ₄	c) AlSO ₄	d) MgCl ₂	a) CaO
10 8	<p>Assertion A: Beer-Lambert's law states that the optical density (OD) of a colored solution is inversely related to its transmittance (T), as described by the equation $OD = 2.0 - \log(T)$.</p> <p>Reason R: This equation signifies that as the transmittance of a colored solution decreases (i.e., less light passes through the solution), the optical density increases. The logarithmic relationship emphasizes that small changes in transmittance correspond to large changes in optical density.</p> <p>In the light of above statement, choose the most appropriate one:</p>				
	a) A is false and R is true	b) Both are true and R is the correct explanation of A	c) Both are true and R is the NOT correct explanation of A	d) Both are false	b) Both are true and R is the correct explanation of A

109	Eriochrome Black-T is used for determination of				
	a) Lime requirement	b) Gypsum requirement	c) Organic C	d) B determination	b) Gypsum requirement
110	<p>True false statement:</p> <p>A) Total greenhouse gas emissions caused directly and indirectly by a person, organisation, event, product or country is known as carbon footprint.</p> <p>B) Global warming refers to the long-term increase in Earth's average surface temperature due to human activities, primarily the emission of greenhouse gases such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O).</p> <p>Choose the correct answer from the option given below</p>				
	a) Both A and B are true	b) B is true only	c) A is true only	d) Both A and B are false	a) Both A and B are true
111	In increasing concentration of pollutants in organisms as we move up the food chain				
	a) Biointensification	b) Bioturbation	c) Biomagnification	d) Bioextinction	c) Biomagnification
112	Total volume of freshwater that is used to produce the goods and services consumed by an individual or community or produced by a business				
	a) Unit water use	b) Water use efficiency	c) Water footprint	d) Virtual water unit	c) Water footprint
113	<p>True false statement:</p> <p>Alkali tolerant green manure is</p> <p>A. Sunhemp</p> <p>B. Cowpea</p> <p>C. Dhaincha</p> <p>D. Sesbania</p> <p>E. Neem</p> <p>Choose the correct answer from the option given below:</p>				
	a) A, B, C only	b) B only	c) E only	d) D, E only	b) Cowpea
114	Which of the following is the most successful international agreement on ozone layer depletion?				
	a) Montreal protocol	b) Kyoto protocol	c) Vienna protocol	d) Copenhagen protocol	a) Montreal protocol
115	In a flower pot water comes out from the pot at the bottom when its potential is				
	a) 5	b) 15	c) 0	d) -15	c) 0
116	If solution P concentration is 10 ppm, then soil P content in kg ha ⁻¹ is				

	a) 2.24	b) 22.4	a) 2.24	b) 22.4	a) 2.24
117	Which of the following statements is NOT TRUE with regard to the ozone layer?				
	a) It absorbs most of the UV-B radiation	b) It screens out the UV-C radiation	c) Its depletion leads to cancer	d) It has now recovered fully	d) It has now recovered fully
118	At soil pH < 7.2, which form of phosphorous is dominated in soil solution				
	a) HPO_4^-	b) PO_4^-	c) H_2PO_4^-	d) P	c) H_2PO_4^-
119	Match the following:				
	A. Fe		i. Blossom end rot		
	B. P		ii. Little leaf		
	C. Ca		iii. Sickle leaf disease		
	D. Zn		iv. Interveinal chlorosis		
	a) A-ii, B-i, C-iv, D-iii	b) A-i, B-iv, C-ii, D-iii	c) A-i, B-ii, C-iii, D-iv	d) A-iv, B-iii, C-i, D-ii	d) A-iv, B-iii, C-i, D-ii
120	The story of Agent Orange: The deadly double agent is connected to				
	a) Herbicide contained dioxin (TCCD)	b) Chemical insulators like PCBs	c) Organic pollutants like DDT	d) Endosulfan	a) Herbicide contained dioxin (TCCD)
121	Highly weathered soil is A) Entisol B) Vertisol C) Histosols D) Oxisols E) Entisol Choose the correct answer from the option given below:				
	a) A and B only	b) D only	c) A, B, C. only	d) E only	d) Oxisols
122	Which micronutrient is most strongly bound to organic matter				
	a) Boron	b) Zinc	c) Copper	d) Molybdenum	c) Copper
123	Given below are two statement: one is labelled as Assertion A and the other is labelled as Reason R: Assertion A: Compaction enhances shear strength and bearing capacity of soil Reason R: Optimum moisture content is the water content at which the dry density of soil is minimum In the light of above statement, choose the most appropriate one.				
	a) A is false and R is true	b) Both are true	c) Both are false	d) R is false and A is true	d) R is false and A is true
124	Which one is NOT a pedogenic process?				

	a) Humification	b) Calcification	c) Laterization	d) Ferruginization	a) Humification
12 5	The concentration of HPO_4^{2-} and H_2PO_4^- ions in solution is equal at a pH of				
	a) 5.6	b) 6.5	c) 7.2	d) 8.2	c) 7.2
12 6	Dehydrogenase activity is a good index of biological activity of soil because it plays role in A) Carbon metabolism B) Respiration C) Synthesis of cell macromolecules D) Cell division E) Replication Choose the correct answer from the option given below:				
	a) A and C only	b) B only	c) A, B, E only	d) E only	b) B only
12 7	In Jenny's factors of soil formation, factor 'b' refers to				
	a) Biological factor	b) Biochemical factor	c) Base-exchange	d) Biosphere	d) Biosphere
12 8	If 2 ml of 1N $\text{K}_2\text{Cr}_2\text{O}_7$ solution was consumed for oxidation of organic C present in 1 gram of a soil, the organic matter percentage of the soil is				
	a) 0.3	b) 0.6	c) 1.0	d) 1.6	d) 1.6
12 9	Given below are two statement: one is labelled as Assertion A and the other is labelled as Reason R: Assertion A: S is required by plants for synthesis of S-containing amino acids cystine, cystein and methionine. Reason R: Visual S deficiency symptoms is characterized by yellowing or chlorosis of older leaves. In the light of above statement, choose the most appropriate one.				
	a) A is true and R is false	b) Both are true	c) R is true and A is false	d) Both are false	a) A is true and R is false
13 0	Mixed indicator' is used for determining				
	a) Soil available P	b) Soil available N	c) Soil available S	d) Soil available K	b) Soil available N
13 1	Yellow margin in maize is due to deficiency of				
	a) N	b) P	c) Mg	d) Fe	a) N
13 2	$\%k = \% \text{K}_2\text{O} \times \dots$				
	a) 0.83	b) 1.20	c) 2.24	d) 2.74	a) 0.83
13 3	Plant growing on rocky area are called as				
	a) Lithophytes	b) Xerophytes	c) Hydrophytes	d) Psammophyte	a) Lithophytes
13 4	Which one is a qualitative solution? A) 1 N NaOH				

	B) 1 M H ₂ SO ₄ C) 2% Boric acid D) 1 g eqv. of a substance in a volume up to 1000 ml E) 1N HCL Choose the correct answer from the option given below:				
	a) A and E only	b) B, D only	c) A, B only	d) C only	d) C only
13 5	Strength of concentrated HNO ₃ is				
	a) 32N	b) 36N	c) 12N	d) 18N	b) 36N
13 6	Application of undecomposed organic matter in soil induceddeficiency in plants				
	a) Mo	b) N	c) P	d) Fe	b) N
13 7	Match the following:				
	A. X-rays		i. 0.03-3.0 nm		
	B. Radiowaves		ii. > 30 cm		
	C. Microwaves		iii. 0.1-30 cm		
	D. Gamma rays		iv. <0.03nm		
	a) A-i, B-ii, C-iii, D-iv	b) A-i, B-iv, C-ii, D-iii	c) A-i, B-ii, C-iv, D-iii	d) A-iv, B-iii, C-i, D-ii	a) A-i, B-ii, C-iii, D-iv
13 8	Which group of enzymes are involved in N-assimilation process in nodule after N-fixation?				
	a) GS and GOGAT	b) Ferredoxin & Flavodoxin	c) Nitrogenase enzyme complexes	d) Phosphatases	a) GS and GOGAT
13 9	Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R: Assertion A: Nitrogen is an essential nutrient for plant growth and development. Reason R: Nitrogen functions as a critical component of amino acids, proteins, and chlorophyll, influencing processes such as photosynthesis, cell division, and overall plant metabolism, thereby asserting its indispensable role in supporting healthy plant growth. In the light of above statement, choose the most appropriate one.				
	a) A is true and R is false	b) Both are true	c) R is true and A is false	d) Both are false	b) Both are true
14 0	Mycorrhizal associations in plants first discovered by a German botanist				
	a) Norman	b) Frank	c) Willfirth	d) Hellriegel	b) Frank
14 1 is called as the large sub-unit of ribosomal RNA gene of fungi				
	a) 18S rDNA	b) 28S rRNA	c) 23S rRNA	d) 5.8S tRNA	a) 18S rDNA
14 2	In the third edition of The Prokaryotes , which one of the following dominates the classification scheme				

	a) biochemical tests	b) phenotypic characteristics	c) Phylogeny	d) None of the above	c) Phylogeny
143	SAR value of high sodium hazard class in quality of irrigation water is A) 0-10 B) 10-18 C) 18-26 D) 15-18 Choose the correct answer from the option given below:				
	a) A and B only	b) B only	c) D only	a) C only	d) C only
144	Three way calibration of critical limit was formulated by				
	a) Cate and Nelson	b) Mitcherlich	c) Jenny	d) Fisher	a) Cate and Nelson
145	What is the salt index of ammonium sulphate?				
	a) 1.61	b) 2.99	c) 6.83	d) 3.25	a) 2.99
146	The processes of assessing the potential of land for a specific use is called as				
	a) Land productivity	b) Soil fertility	c) Land suitability	d) Land capability	c) Land suitability
147	Optimum pH for Nitrification is A) 8.5 B) 6.5 C) 4.5 D) 3.5 E) 9.5 Choose the correct answer from the option given below:				
	a) A only	b) B only	c) D, E only	C only	a) A only
148	Bronzing in rice crop is due to				
	a) Fe toxicity	b) Mn deficiency	c) B deficiency	d) S deficiency	a) Fe toxicity
149	Given below are two statement: one is labelled as Assertion A and the other is labelled as Reason R: Assertion A: Mycorrhiza symbiosis enhances nutrient uptake and promotes plant resilience to environmental stress. Reason R: Mycorrhiza fungi and plant roots facilitate the exchange of nutrients, particularly phosphorus and micronutrients, while also aiding in water absorption and enhancing the plant's tolerance to various environmental stresses such as drought, pathogens, and heavy metals, thereby emphasizing its role in improving plant health and productivity. In the light of above statement, choose the most appropriate one				

	a) A is true and R is false	b) Both are false	c) R is true and A is false	d) Both are true & R is the correct explanation of A	d) Both are true & R is the correct explanation of A
150	Most of the essential plant nutrient are present in available form				
	a) In organic soil	b) Compacted soil	c) Sub soil	d) Surface soil	d) Surface soil