

# 11 Microbiology ICAR SEPT 2022

Topic:- GEN KNOW COMMON PHD

1) Colour of the tag used on certified seed bags is[Question ID = 16958][Question Description = 101\_221\_GKD\_SEP22\_Q01]

1. Blue [Option ID = 37829]
2. Purple [Option ID = 37830]
3. White [Option ID = 37831]
4. Golden Yellow [Option ID = 37832]

2) Following are the statements regarding the Usar soil -

- A. It is reclaimed by adding lime.
- B. This soil has pH more than seven.
- C. Paddy crop can be grown in this soil.

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

[Question ID = 16959][Question Description = 102\_221\_GKD\_SEP22\_Q02]

1. A and B only [Option ID = 37833]
2. B and C only [Option ID = 37834]
3. C only [Option ID = 37835]
4. A only [Option ID = 37836]

3) When total utility of a commodity increases, marginal utility will be

[Question ID = 16960][Question Description = 103\_221\_GKD\_SEP22\_Q03]

1. Negative but increasing  
[Option ID = 37837]
2. Positive but decreasing  
[Option ID = 37838]
3. Constant  
[Option ID = 37839]
4. Either positive or negative  
[Option ID = 37840]

4) Where is the headquarter of International Fund for Agriculture Development located?

[Question ID = 16961][Question Description = 104\_221\_GKD\_SEP22\_Q04]

1. Vienna, Austria  
[Option ID = 37841]
2. Rome, Italy  
[Option ID = 37842]
3. New York, USA  
[Option ID = 37843]
4. Berlin, Germany  
[Option ID = 37844]

5) Mid-Oceanic Ridges are one of the important divisions of the ocean floor. In this respect, point out the incorrect statement regarding the 'Mid-Oceanic Ridges'. [Question ID = 16962][Question Description = 105\_221\_GKD\_SEP22\_Q05]

1. It is the largest mountain chain on the surface of the earth [Option ID = 37845]
2. It is a series of interconnected chain within the ocean. [Option ID = 37846]
3. It is characterised by a central rift system [Option ID = 37847]
4. The rift system at the crest is the zone of very low volcanic activity. [Option ID = 37848]

6) Consider the following facts about the union territory of India and point out the one which is incorrect in relation to union territory. [Question ID = 16963][Question Description = 106\_221\_GKD\_SEP22\_Q06]

1. These are the areas under the direct control of central government. [Option ID = 37849]
2. Also known as the 'centrally administered territories. [Option ID = 37850]

3. These territories constitute a conspicuous departure from the unitary feature of India. [Option ID = 37851]
4. There is no uniformity in their administrative systems. [Option ID = 37852]

**7) Variety of flora and fauna are found in the different types of forest in India. In this regard, species of trees like teak, *sal shisham*, *sandalwood*, etc. are found in which of the following type of forests in India?**[Question ID = 16964][Question Description = 107\_221\_GKD\_SEP22\_Q07]

1. Tropical evergreen forests [Option ID = 37853]
2. Tropical thorn forests [Option ID = 37854]
3. Tropical deciduous forests [Option ID = 37855]
4. Montane forests [Option ID = 37856]

**8) The Marginal Preference Theory of consumption behaviour was proposed by**

**[Question ID = 16965][Question Description = 108\_221\_GKD\_SEP22\_Q08]**

1. Armstrong  
[Option ID = 37857]
2. J.K.Hicks  
[Option ID = 37858]
3. Neumann  
[Option ID = 37859]
4. Edmund Cannon  
[Option ID = 37860]

**9) Point out the incorrect statements regarding the service sector in India.**[Question ID = 16966][Question Description = 109\_221\_GKD\_SEP22\_Q09]

1. It is the highest contributor to GDP [Option ID = 37861]
2. It requires skilled labour [Option ID = 37862]
3. It is the fastest growing sector [Option ID = 37863]
4. It is restricted to very few sectors. [Option ID = 37864]

**10) Consider the statements regarding the agriculture sector in India and point out the incorrect statement.**[Question ID = 16967][Question Description = 110\_221\_GKD\_SEP22\_Q10]

1. Agriculture sector is the largest employer of workforce [Option ID = 37865]
2. It has contributed to the Gross Value Added (GVA) [Option ID = 37866]
3. Growth in allied sectors is the major drivers of overall growth in the sector. [Option ID = 37867]
4. Minimum Support Price (MSP) policy is used as to promote crop uniformity. [Option ID = 37868]

**11) In case of related goods, the cross elasticity of demand is**[Question ID = 16968][Question Description = 111\_221\_GKD\_SEP22\_Q11]

1. Low [Option ID = 37869]
2. High [Option ID = 37870]
3. Zero [Option ID = 37871]
4. Unity [Option ID = 37872]

**12) With reference to organic farming in India, consider the following statements :**

- A. The National Programme for Organic Production' (NPOP) is operated under the guidelines and directions of the Union Ministry of Rural Development.
- B. The Agricultural and Processed Food Products Export Development Authority' (APEDA) functions as the Secretariat for the implementation of NPOP.
- C. Sikkim has become India's first fully organic state.

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

**[Question ID = 16969][Question Description = 112\_221\_GKD\_SEP22\_Q12]**

1. A and B only  
[Option ID = 37873]
2. B and C only  
[Option ID = 37874]
3. C only  
[Option ID = 37875]
4. A, B and C

[Option ID = 37876]

13) With reference to the circumstances in Indian agriculture, the concept of "Conservation Agriculture" assumes significance. Which of the following falls under the Conservation Agriculture ?

- A. Avoiding the monoculture practices.
- B. Adopting minimum tillage.
- C. Avoiding the cultivation of plantation crops.
- D. Using crop residues to cover soil surface.
- E. Adopting spatial and temporal crop sequencing/ crop rotations.

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

[Question ID = 16970][Question Description = 113\_221\_GKD\_SEP22\_Q13]

- 1. A, C and D only [Option ID = 37877]
- 2. B, C, D and E only [Option ID = 37878]
- 3. B, D and E only [Option ID = 37879]
- 4. A, B, C and E only [Option ID = 37880]

14) Consumers are likely to get a variety of goods in which kind of market competition[Question ID = 16971][Question Description = 114\_221\_GKD\_SEP22\_Q14]

- 1. Monopoly [Option ID = 37881]
- 2. Duopoly [Option ID = 37882]
- 3. Oligopoly [Option ID = 37883]
- 4. Monopolistic [Option ID = 37884]

15) What is the correct chronological order of the following laws enacted for the conservation and protection of environment ?

- A. Environment (Protection) Act.
- B. Water (Prevention & Control of Pollution) Act.
- C. Air (Prevention & Control of pollution) Act.
- D. National Green Tribunal Act.

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

[Question ID = 16972][Question Description = 115\_221\_GKD\_SEP22\_Q15]

- 1. B, C, A, D [Option ID = 37885]
- 2. A, B, C, D [Option ID = 37886]
- 3. C, B, A, D [Option ID = 37887]
- 4. D, C, B, A [Option ID = 37888]

16) The scientific study of soil is[Question ID = 16973][Question Description = 116\_221\_GKD\_SEP22\_Q16]

- 1. Earth Study [Option ID = 37889]
- 2. Soil Science [Option ID = 37890]
- 3. Pedology [Option ID = 37891]
- 4. Soil Chemistry [Option ID = 37892]

17) *Triticum aestivum*, the common bread wheat is -

[Question ID = 16974][Question Description = 117\_221\_GKD\_SEP22\_Q17]

- 1. Tetraploid

[Option ID = 37893]

- 2. Hexaploid

[Option ID = 37894]

- 3. Haploid

[Option ID = 37895]

- 4. Diploid

[Option ID = 37896]

18) Sectoral inflation refers to[Question ID = 16975][Question Description = 118\_221\_GKD\_SEP22\_Q18]

- 1. Running inflation [Option ID = 37897]

2. Comprehensive inflation [Option ID = 37898]
3. Sporadic inflation [Option ID = 37899]
4. Creeping inflation [Option ID = 37900]

**19) Keynes Liquidity trap refers to[Question ID = 16976][Question Description = 119\_221\_GKD\_SEP22\_Q19]**

1. Speculative demand for money [Option ID = 37901]
2. Transactions motive of money is inelastic [Option ID = 37902]
3. Precautionary motive of money is inelastic [Option ID = 37903]
4. Transactions motive of money is constant [Option ID = 37904]

**20) A business is solvent if[Question ID = 16977][Question Description = 120\_221\_GKD\_SEP22\_Q20]**

1. Total receipts exceed total expenditures [Option ID = 37905]
2. Total debt exceeds total equity [Option ID = 37906]
3. Total sales exceed total cash expense [Option ID = 37907]
4. Total assets exceed total liabilities [Option ID = 37908]

Topic:- Crop Sc 3\_PHD

**1) Which of the following statement is NOT true about telomerase?**

**[Question ID = 2851][Question Description = 101\_54\_CRP\_SEP22\_Q01]**

1. Telomerase contains a ribozyme. [Option ID = 11401]
2. Telomerase activity decreases as the cell ages. [Option ID = 11402]
3. Telomere synthesis requires the 3' end of the chromosome as primer and proceeds in usual 5'→3' direction. [Option ID = 11403]
4. Telomere synthesis requires the 5' end of the chromosome as primer and proceeds in usual 3'→5' direction. [Option ID = 11404]

**2) Read the following statements-**

- A. Peptide bond of the protein is formed by the enzyme peptidase.
- B. The primary structure of a protein is a sequence of amino acids joined by a peptide bond.
- C. Tertiary structure of a protein is stabilized by ionic, hydrogen, and covalent bonds.
- D. The hydrophilic/hydrophobic character of amino acid residues is important to the tertiary structure of a protein.
- E. The ability of peptide bonds to form intramolecular hydrogen bonds is important to secondary structure.

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

**[Question ID = 2852][Question Description = 102\_54\_CRP\_SEP22\_Q02]**

1. A, B and D only [Option ID = 11405]
2. B, C and D only [Option ID = 11406]
3. B, D and E only [Option ID = 11407]
4. C, D and E only [Option ID = 11408]

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

**Assertion A: Enzyme becomes inactive at below minimum temperature.**

**Reason R: The inactivity of the enzymes is due to denaturation.**

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

**[Question ID = 2853][Question Description = 103\_54\_CRP\_SEP22\_Q03]**

1. Both A and R are correct and R is the correct explanation of A. [Option ID = 11409]
2. Both A and R are correct but R is **NOT** the correct explanation of A. [Option ID = 11410]
3. A is correct but R is not correct. [Option ID = 11411]
4. A is not correct but R is correct. [Option ID = 11412]

**4) Who discovered the enzyme reverse transcriptase?[Question ID = 2854][Question Description = 104\_54\_CRP\_SEP22\_Q04]**

1. Temin and Kornberg [Option ID = 11413]
2. Kornberg and Baltimore [Option ID = 11414]
3. Grunberg and Ochoa [Option ID = 11415]
4. Temin and Baltimore [Option ID = 11416]

**5) Which of the following mechanisms will remove uracil and incorporate the correct base?**

**[Question ID = 2855][Question Description = 105\_54\_CRP\_SEP22\_Q05]**

1. Nucleotide excision repair [Option ID = 11417]

2. Double-strand break repair [Option ID = 11418]
3. Mismatch repair [Option ID = 11419]
4. Base excision repair [Option ID = 11420]

6) Which of the following statement is NOT correct about genetic codons?

[Question ID = 2856][Question Description = 106\_54\_CRP\_SEP22\_Q06]

1. An amino acid may be specified by more than one codon. [Option ID = 11421]
2. AUG is the most common signal for the beginning of a polypeptide in all cells. [Option ID = 11422]
3. Genetic codons are triplet of nucleotide that codes for a specific amino acid. [Option ID = 11423]
4. Genetic codons are read in successive and overlapping fashion. [Option ID = 11424]

7) What are the smallest terpenes, containing a single isoprene unit named?[Question ID = 2857][Question Description = 107\_54\_CRP\_SEP22\_Q07]

1. Hemiterpenes [Option ID = 11425]
2. Monoterpenes [Option ID = 11426]
3. Sesquiterpenes [Option ID = 11427]
4. Diterpenes [Option ID = 11428]

8) Given below are two statements-

**Statement I:** Compatible solutes/osmolytes are the organic compounds that are osmotically inactive in the cell and do not destabilize the membrane, when plants are under stress.

**Statement II:** Plant cells can tolerate high concentration of these compounds without any detrimental effect on metabolism.

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

[Question ID = 2858][Question Description = 108\_54\_CRP\_SEP22\_Q08]

1. Both Statement I and Statement II are true [Option ID = 11429]
2. Both Statement I and Statement II are false [Option ID = 11430]
3. Statement I is true but Statement II is false [Option ID = 11431]
4. Statement I is false but Statement II is true [Option ID = 11432]

9) The molarity of a solution of substance express the number of moles of the substance in \_\_\_\_\_[Question ID = 2859]

[Question Description = 109\_54\_CRP\_SEP22\_Q09]

1. One cubic centimeter of solution [Option ID = 11433]
2. One cubic decimeter of solution [Option ID = 11434]
3. One cubic millimeter of solution [Option ID = 11435]
4. One milliliter of solution [Option ID = 11436]

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

**Assertion A :** Most of the wood fungi grow well on barks/logs/woods.

**Reason R :** Wood fungi have the enzyme cellulase which breaks the  $\beta$  (1 --> 4) glycosidic bond in cellulose and get the metabolized sugar for themselves.

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

[Question ID = 2860][Question Description = 110\_54\_CRP\_SEP22\_Q10]

1. Both A and R are true and R is the correct explanation of A [Option ID = 11437]
2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 11438]
3. A is true but R is false [Option ID = 11439]
4. A is false but R is true [Option ID = 11440]

11) Which of the following enzyme is responsible for hydrolysis of stored triacylglycerols to release fatty acids in germinating seeds?

[Question ID = 2861][Question Description = 111\_54\_CRP\_SEP22\_Q11]

1. Laccases [Option ID = 11441]
2. Lipoygenases [Option ID = 11442]
3. Co-Lipases [Option ID = 11443]
4. Lipases [Option ID = 11444]

12) Which of the following is the only vitamin containing a trace element, cobalt (Co)?

[Question ID = 2862][Question Description = 112\_54\_CRP\_SEP22\_Q12]

1. Vitamin B<sub>2</sub> [Option ID = 11445]
2. Vitamin B<sub>12</sub> [Option ID = 11446]
3. Vitamin B<sub>7</sub> [Option ID = 11447]
4. Vitamin B<sub>6</sub> [Option ID = 11448]

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

Assertion A : Hygroscopic water is held by soil particles of colloidal complex due to adhesive force.

Reason R : Hygroscopic water is generally available water to plant roots.

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

[Question ID = 2863][Question Description = 113\_54\_CRP\_SEP22\_Q13]

1. Both A and R are true and R is the correct explanation of A [Option ID = 11449]
2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 11450]
3. A is true but R is false [Option ID = 11451]
4. A is false but R is true [Option ID = 11452]

14) Who defined “enzymes” as simple or compound proteins acting as specific catalysts?[Question ID = 2864][Question Description = 114\_54\_CRP\_SEP22\_Q14]

1. Buchner (1897) [Option ID = 11453]
2. Kuhne (1898) [Option ID = 11454]
3. Porter (1955) [Option ID = 11455]
4. Mayrback (1952) [Option ID = 11456]

15) Given below are two statements-

Statement I: Reduced CO<sub>2</sub> concentration favours opening of stomata while an increase in CO<sub>2</sub> concentration promotes stomatal closing.

Statement II: Accumulation of abscisic acid causes closing of stomata in plants.

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

[Question ID = 2865][Question Description = 115\_54\_CRP\_SEP22\_Q15]

1. Both Statement I and Statement II are true [Option ID = 11457]
2. Both Statement I and Statement II are false [Option ID = 11458]
3. Statement I is true but Statement II is false [Option ID = 11459]
4. Statement I is false but Statement II is true [Option ID = 11460]

16) Match List I with List II

| List I         | List II                                    |
|----------------|--|
| Plant Hormone  | Function                                   |
| A. Auxin       | I. Hyponasty of leaves                     |
| B. Gibberellin | II. Prevention of premature drop of fruits |
| C. Cytokinin   | III. Increases chlorophyllase activity     |
| D. Ethylene    | IV. Delay of senescence                    |

Choose the correct answer from the options given below:

[Question ID = 2866][Question Description = 116\_54\_CRP\_SEP22\_Q16]

1. A - II, B - III, C - IV, D - I [Option ID = 11461]
2. A - I, B - II, C - III, D - IV [Option ID = 11462]
3. A - II, B - I, C - IV, D - III [Option ID = 11463]
4. A - IV, B - I, C - II, D - III [Option ID = 11464]

17) Given below are two statements-

Statement I: Molybdenum deficiency in plants is characterized by wilting of terminal shoots followed by frequent death.

Statement II: Boron deficient plants produce lesser number of flowers and are sterile or lacking.

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

[Question ID = 2867][Question Description = 117\_54\_CRP\_SEP22\_Q17]

1. Both Statement I and Statement II are true [Option ID = 11465]
2. Both Statement I and Statement II are false [Option ID = 11466]
3. Statement I is true but Statement II is false [Option ID = 11467]
4. Statement I is false but Statement II is true [Option ID = 11468]

18) Consider the following statements-

- A. Water, aeration and temperature are the most important factors which influence seed germination.
- B. Light plays a meagre role in seed germination.
- C. The seed viability is lost when anabolism is exceeded by catabolism.
- D. Generally, carbon dioxide reduces the percentage of germination.

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

[Question ID = 2868][Question Description = 118\_54\_CRP\_SEP22\_Q18]

- 1. A, B and C only [Option ID = 11469]
- 2. A, C and D only [Option ID = 11470]
- 3. B, C and D only [Option ID = 11471]
- 4. A, B and D only [Option ID = 11472]

19) Who proposed the theory of two-phase flowering?[Question ID = 2869][Question Description = 119\_54\_CRP\_SEP22\_Q19]

- 1. Chailakhyan (1968) [Option ID = 11473]
- 2. Lobimenka and Scheglova (1938) [Option ID = 11474]
- 3. Knott (1934) [Option ID = 11475]
- 4. Bunning (1958) [Option ID = 11476]

20) Who proposed the Osmotic theory for water absorption?

[Question ID = 2870][Question Description = 120\_54\_CRP\_SEP22\_Q20]

- 1. Atkins and Priestly [Option ID = 11477]
- 2. Thimann [Option ID = 11478]
- 3. Kärner [Option ID = 11479]
- 4. Levitt [Option ID = 11480]

21) Given below are two statements-

Statement I: Transpiration may occur through the cuticle, lenticels or stomata.

Statement II: Transpiration creates suction force and helps in the ascent of sap.

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

[Question ID = 2871][Question Description = 121\_54\_CRP\_SEP22\_Q21]

- 1. Both Statement I and Statement II are correct [Option ID = 11481]
- 2. Both Statement I and Statement II are incorrect [Option ID = 11482]
- 3. Statement I is correct but Statement II is incorrect [Option ID = 11483]
- 4. Statement I is incorrect but Statement II is correct [Option ID = 11484]

22) Match List I with List II

| List I             | List II                        |
|--------------------|--------------------------------|
| Scientist          | Proposed theory                |
| A. Godlewski       | I. Pulsation theory            |
| B. J. C. Bose      | II. Relay pump theory          |
| C. Boehm           | III. Transpiration pull theory |
| D. Dixon and Jolly | IV. Capillarity                |

Choose the correct answer from the options given below:

[Question ID = 2872][Question Description = 122\_54\_CRP\_SEP22\_Q22]

- 1. A - III, B - IV, C - I, D - II [Option ID = 11485]
- 2. A - III, B - I, C - IV, D - II [Option ID = 11486]
- 3. A - II, B - I, C - IV, D - III [Option ID = 11487]
- 4. A - II, B - IV, C - I, D - III [Option ID = 11488]

23) Given below are two statements-

Statement I: Each photon contains an amount of energy that is called a quantum.

Statement II: Quantum yield of photosynthesis is ratio of number of photochemical products to total number of quanta absorbed.

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

[Question ID = 2873][Question Description = 123\_54\_CRP\_SEP22\_Q23]

1. Both Statement I and Statement II are correct [Option ID = 11489]
2. Both Statement I and Statement II are incorrect [Option ID = 11490]
3. Statement I is correct but Statement II is incorrect [Option ID = 11491]
4. Statement I is incorrect but Statement II is correct [Option ID = 11492]

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

Assertion A: Tryptophan is primary precursor of IAA in plants.

Reason R: TIBA inhibits polar auxin transport and called as antiauxins.

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

[Question ID = 2874][Question Description = 124\_54\_CRP\_SEP22\_Q24]

1. Both A and R are correct and R is the correct explanation of A [Option ID = 11493]
2. Both A and R are correct but R is NOT the correct explanation of A [Option ID = 11494]
3. A is correct but R is not correct [Option ID = 11495]
4. A is not correct but R is correct [Option ID = 11496]

25) Given below are two statements-

Statement I: Seeds with life span of a few weeks to 4 years are known as “Microbiotic seeds”.

Statement II: Seeds with life span varying from 15 years to 100 years or more are known as “Macrobiotic seeds”.

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

[Question ID = 2875][Question Description = 125\_54\_CRP\_SEP22\_Q25]

1. Both Statement I and Statement II are correct [Option ID = 11497]
2. Both Statement I and Statement II are incorrect [Option ID = 11498]
3. Statement I is correct but Statement II is incorrect [Option ID = 11499]
4. Statement I is incorrect but Statement II is correct [Option ID = 11500]

26) Match List I with List II

| List I                                       | List II  |
|--|--|
| Scientists                                   | Associated with  |
| A. W Arber, D Nathans, and H O Smith         | I. RNA interference (RNAi)                                     |
| B. A Z Fire and C C Mello                    | II. CRISPR Technology  |
| C. Marc V Montagu, M D Chilton, and R Fraley | III. Recombinant DNA technology using restriction endonuclease |
| D. J Doudna and E Charpentier                | IV. <i>Agrobacterium</i> -mediated genetic transformation      |

Choose the correct answer from the options given below:

[Question ID = 2876][Question Description = 126\_54\_CRP\_SEP22\_Q26]

1. A - III, B - II, C - I, D - IV [Option ID = 11501]
2. A - III, B - IV, C - I, D - II [Option ID = 11502]
3. A - III, B - I, C - IV, D - II [Option ID = 11503]
4. A - I, B - II, C - III, D - IV [Option ID = 11504]

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

Assertion A: Golden Rice (GR) is rich in pro-vitamin A.

Reason R: GR is engineered with two genes (*psy* and *crtl*) of the beta-carotene biosynthesis pathway.

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

[Question ID = 2877][Question Description = 127\_54\_CRP\_SEP22\_Q27]

1. Both A and R are true and R is the correct explanation of A [Option ID = 11505]
2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 11506]
3. A is true but R is false [Option ID = 11507]
4. A is false but R is true [Option ID = 11508]

28) Which of the following strategy was used in genetically engineered *Rainbow* papaya to control ringspot virus?[Question ID = 2878][Question Description = 128\_54\_CRP\_SEP22\_Q28]

1. Antisense RNA approach [Option ID = 11509]
2. Ribozyme [Option ID = 11510]
3. cDNA of RNA satellite [Option ID = 11511]
4. Coat protein gene [Option ID = 11512]



29) Which of the following component is enriched/fortified in CRISPR-edited tomatoes commercialized in Japan?

[Question ID = 2879][Question Description = 129\_54\_CRP\_SEP22\_Q29]

1. Enriched with omega-3-fatty acids [Option ID = 11513]
2. Fortified with Fe and Zn [Option ID = 11514]
3. Enriched in gamma-aminobutyric acid [Option ID = 11515]
4. Enriched in lycopene and anthocyanin [Option ID = 11516]

30) Which population type do NAM and MAGIC represents?

[Question ID = 2880][Question Description = 130\_54\_CRP\_SEP22\_Q30]

1. Eco-tilling population [Option ID = 11517]
2. Uni-parental population [Option ID = 11518]
3. Multi-parent population [Option ID = 11519]
4. Bi-parental population [Option ID = 11520]

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

Assertion A: Biological Nitrogen Fixation (BNF) converts  $N_2$  gas to ammonia ( $NH_3$ ).

Reason R: BNF are catalyzed by a *nitrogenase* protein complex in legumes.

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

[Question ID = 2881][Question Description = 131\_54\_CRP\_SEP22\_Q31]

1. Both A and R are true and R is the correct explanation of A [Option ID = 11521]
2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 11522]
3. A is true but R is false [Option ID = 11523]
4. A is false but R is true [Option ID = 11524]

32) Who among the following first reported generation of haploid plants from pollen grains?

[Question ID = 2882][Question Description = 132\_54\_CRP\_SEP22\_Q32]

1. Murashige and Skoog [Option ID = 11525]
2. Maheshwari and Guha [Option ID = 11526]
3. Nitch and Nitch [Option ID = 11527]
4. Reinert and Steward [Option ID = 11528]

33) Which of the following is the main effect of cytokinins in the tissue culture system?

[Question ID = 2883][Question Description = 133\_54\_CRP\_SEP22\_Q33]

1. Adventitious root formation [Option ID = 11529]
2. Induction of somatic embryos [Option ID = 11530]
3. Adventitious shoot formation [Option ID = 11531]
4. Shoot elongation [Option ID = 11532]

34) How many sister chromatids are present in the maize (*Zea mays*) plant cell that is entering the first meiotic division?

[Question ID = 2884][Question Description = 134\_54\_CRP\_SEP22\_Q34]

1. 10 [Option ID = 11533]
2. 20 [Option ID = 11534]
3. 30 [Option ID = 11535]
4. 40 [Option ID = 11536]

35) Given below are two statements

Statement I: Watson and Crick proposed semi-conservative DNA replication.

Statement II:  $^{35}S$  is used in proving semi-conservative DNA replication.

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

[Question ID = 2885][Question Description = 135\_54\_CRP\_SEP22\_Q35]

1. Both Statement I and Statement II are true [Option ID = 11537]
2. Both Statement I and Statement II are false [Option ID = 11538]
3. Statement I is true but Statement II is false [Option ID = 11539]
4. Statement I is false but Statement II is true [Option ID = 11540]

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

Assertion A: Mismatch repair system is dependent on the methylation.

Reason R: MutS is a site-specific endonuclease that acts only on the hemimethylated GATC sequence.

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

[Question ID = 2886][Question Description = 136\_54\_CRP\_SEP22\_Q36]

- Both A and R are true and R is the correct explanation of A [Option ID = 11541]
- Both A and R are true but R is NOT the correct explanation of A [Option ID = 11542]
- A is true but R is false [Option ID = 11543]
- A is false but R is true [Option ID = 11544]

37) What is the histone octamer made of?

[Question ID = 2887][Question Description = 137\_54\_CRP\_SEP22\_Q37]

- 5 types of histones [Option ID = 11545]
- 8 types of histones [Option ID = 11546]
- 8 histones of 4 different types [Option ID = 11547]
- 6 histones of 3 different types [Option ID = 11548]

38) Match List I with List II

| List I                               | List II  |
|--------------------------------------|--|
| Enzyme                               | Function   |
| A. Alkaline phosphatase              | I. Removes nucleotide residues from the 3' ends of a DNA strand.                         |
| B. Polynucleotide kinase             | II. Cleave DNA molecules at a specific base sequence.                                    |
| C. Exonuclease III                   | III. Removes terminal phosphates from the 5' or 3' end (or both).                        |
| D. Type II restriction endonucleases | IV. Joins two DNA molecules or fragments.  |
| E. DNA ligase                        | V. Adds a phosphate to the 5'-OH end of a polynucleotide to label it or permit ligation. |

Choose the correct answer from the options given below:

[Question ID = 2888][Question Description = 138\_54\_CRP\_SEP22\_Q38]

- A - III, B - V, C - I, D - II, E -IV

[Option ID = 11549]

- A - V, B - III, C - I, D - II, E -IV

[Option ID = 11550]

- A - I, B - V, C - III, D - II, E -IV

[Option ID = 11551]

- A - IV, B - III, C - I, D - II, E -V

[Option ID = 11552]

39) Match List I with List II

| List I               | List II                              |
|----------------------|--------------------------------------|
| Genes / Its products | Gene product / Function              |
| A. <i>fixLJ</i>      | I. Membrane bound cytochrome oxidase |
| B. <i>fixNOQP</i>    | II. Oxygen responsive regulator      |
| C. <i>nifH</i>       | III. Negative regulator              |
| D. NifA              | IV. Dinitrogenase reductase          |
| E. NifL              | V. Positive regulator                |

Choose the correct answer from the options given below:

[Question ID = 2889][Question Description = 139\_54\_CRP\_SEP22\_Q39]

- A - V, B - III, C - II, D - I, E - IV [Option ID = 11553]
- A - IV, B - V, C - III, D - II, E - I [Option ID = 11554]
- A - II, B - I, C - IV, D - V, E - III [Option ID = 11555]
- A - II, B - V, C - IV, D - I, E - III [Option ID = 11556]

40) Common cause of gastrointestinal illness due to contaminated water and the leading cause of GI illnesses worldwide is \_\_\_\_\_.

[Question ID = 2890][Question Description = 140\_54\_CRP\_SEP22\_Q40]

- Legionella pneumophila* [Option ID = 11557]
- Toxoplasma* [Option ID = 11558]
- Norovirus [Option ID = 11559]
- Clostridium perfringens* [Option ID = 11560]

41) Match List I with List II

| List I                        | List II                          |
|-------------------------------|----------------------------------|
| Primary/Secondary Metabolites | Commercial significance          |
| A. Glutamic acid              | I. Anticancer agent              |
| B. Phenylalanine              | II. Cholesterol lowering agent   |
| C. Lysine                     | III. Antiparasitic agent         |
| D. Lovastatin                 | IV. Precursor agent of aspartame |
| E. Avermectin                 | V. Flavour enhancer agent        |
| F. Bleomycin                  | VI. Feed supplement agent        |

Choose the correct answer from the options given below:

[Question ID = 2891][Question Description = 141\_54\_CRP\_SEP22\_Q41]

1. A - IV , B - VI , C - II , D - V , E - I , F - III [Option ID = 11561]
2. A - V , B - IV , C - VI , D - II , E - III , F - I [Option ID = 11562]
3. A - III , B - VI , C - II , D - V , E - I , F - IV [Option ID = 11563]
4. A - VI , B - III , C - V , D - I , E - IV , F - II [Option ID = 11564]

42) Given below are two statements-

Statement I: As of now, 11 types of biofertilizers (bacterial and fungal) are approved under Fertilizer Control Order in India.

Statement II: Since not approved under FCO, algal biofertilizers like blue green algae are not available in the market.

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

[Question ID = 2892][Question Description = 142\_54\_CRP\_SEP22\_Q42]

1. Both Statement I and Statement II are correct [Option ID = 11565]
2. Both Statement I and Statement II are incorrect [Option ID = 11566]
3. Statement I is correct but Statement II is incorrect [Option ID = 11567]
4. Statement I is incorrect but Statement II is correct [Option ID = 11568]

43) In statistics, skewness is referred to \_\_\_\_\_.

[Question ID = 2893][Question Description = 143\_54\_CRP\_SEP22\_Q43]

1. Measure of peakedness [Option ID = 11569]
2. Measure of convexity [Option ID = 11570]
3. Lack of symmetry [Option ID = 11571]
4. Measure of chance that an event occurs [Option ID = 11572]

44) Given below are two statements-

Statement I: Ion torrent sequencing method measures the release of protons (H<sup>+</sup>) each time a new deoxyribonucleotide is added to a growing strand of DNA and the resulting pH change by an electrode.

Statement II: In nanopore sequencing method, a DNA double helix is allowed to passthrough a protein nanopore, which causes changes in electric current that are base specific.

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

[Question ID = 2894][Question Description = 144\_54\_CRP\_SEP22\_Q44]

1. Both Statement I and Statement II are true [Option ID = 11573]
2. Both Statement I and Statement II are false [Option ID = 11574]
3. Statement I is true but Statement II is false [Option ID = 11575]
4. Statement I is false but Statement II is true [Option ID = 11576]

45) The term "Vaccines" derived from Latin word *vacca*, meaning\_\_\_\_\_. [Question ID = 2895][Question Description = 145\_54\_CRP\_SEP22\_Q45]

1. Cow [Option ID = 11577]
2. Sheep [Option ID = 11578]
3. Fox [Option ID = 11579]
4. Goat [Option ID = 11580]

46) Which of the following statements are true regarding electron microscopy?

- A. Produces good magnification but inferior resolution over light microscopy.
- B. Uses electron beam with wavelength of 0.05 Å°.
- C. Microbes can be viewed in living state under transmission electron microscope.

D. Scanning electron microscope can reveal striking three dimensional picture of specimen.

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

[Question ID = 2896][Question Description = 146\_54\_CRP\_SEP22\_Q46]

1. A, B and D only [Option ID = 11581]
2. A, C and D only [Option ID = 11582]
3. B and D only [Option ID = 11583]
4. A and D only [Option ID = 11584]

47) Which of the following organisms are capable of using either respiratory or fermentation processes, depending on the availability of oxygen in the cultural environment?

[Question ID = 2897][Question Description = 147\_54\_CRP\_SEP22\_Q47]

1. Obligate anaerobes [Option ID = 11585]
2. Facultative anaerobes [Option ID = 11586]
3. Obligate aerobes [Option ID = 11587]
4. Microaerophiles [Option ID = 11588]

48) Given below are two statements-

Statement I: Autotroph can derive its carbon from carbon dioxide.

Statement II: Lithotroph is an organism that uses organic molecules as sources of electron.

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

[Question ID = 2898][Question Description = 148\_54\_CRP\_SEP22\_Q48]

1. Both Statement I and Statement II are true [Option ID = 11589]
2. Both Statement I and Statement II are false [Option ID = 11590]
3. Statement I is true but Statement II is false [Option ID = 11591]
4. Statement I is false but Statement II is true [Option ID = 11592]

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

Assertion A : Nitrogenase enzyme complex is highly sensitive to oxygen and must be protected from oxygen inactivation for nitrogen fixation process.

Reason R : *Azotobacter* forms specialized cell structure called heterocyst to prevent oxygen inactivation of nitrogenase.

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

[Question ID = 2899][Question Description = 149\_54\_CRP\_SEP22\_Q49]

1. Both A and R are true and R is the correct explanation of A [Option ID = 11593]
2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 11594]
3. A is true but R is false [Option ID = 11595]
4. A is false but R is true [Option ID = 11596]

50) Which of the following method is used to determine species richness in soil sample?[Question ID = 2900][Question Description = 150\_54\_CRP\_SEP22\_Q50]

1. Viable plate count [Option ID = 11597]
2. Fatty acid methyl ester profiles [Option ID = 11598]
3. Soil respiration [Option ID = 11599]
4. Soil enzymes activity [Option ID = 11600]

Topic:- 11 Microbiology\_PHD

1) Who is called as founder of soil microbiology?

[Question ID = 3051][Question Description = 101\_159\_AMM\_SEP22\_Q01]

1. Louis Pasteur [Option ID = 12201]
2. Sergei Winogradsky [Option ID = 12202]
3. Dimitri Ivanovski [Option ID = 12203]
4. W. M. Stanley [Option ID = 12204]

2) Read the following statements regarding mycoplasma-

A. Has pseudopeptidoglycan in cell wall.

B. Excretion of hydrogen peroxide by mycoplasma adherent to the surface of cells appears to be an important factor causing tissue damage.

C. *Mycoplasma pneumoniae* is airborne in nature and causative agent of atypical pneumonia.

D. Antibiotic penicillin is superior in the inhibition of mycoplasmas.

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

[Question ID = 3052][Question Description = 102\_159\_AMM\_SEP22\_Q02]

1. B, C and D only

[Option ID = 12205]

2. A, C and D only

[Option ID = 12206]

3. B and C only

[Option ID = 12207]

4. A and D only

[Option ID = 12208]

3) Given below are two statements-

Statement I: An undefined or complex microbiological medium is the one whose precise chemical composition is known.

Statement II: A fastidious organism is unable to synthesize a range of nutrients and therefore has complex requirements in culture medium.

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

[Question ID = 3053][Question Description = 103\_159\_AMM\_SEP22\_Q03]

1. Both Statement I and Statement II are true [Option ID = 12209]

2. Both Statement I and Statement II are false [Option ID = 12210]

3. Statement I is true but Statement II is false [Option ID = 12211]

4. Statement I is false but Statement II is true [Option ID = 12212]

4) The microbial composition of mycorrhizal root systems is very different from that of nonmycorrhizal roots, a phenomenon known as the\_\_\_\_\_.

[Question ID = 3054][Question Description = 104\_159\_AMM\_SEP22\_Q04]

1. Mycozoneplus effect [Option ID = 12213]

2. Mycorrhizosphere effect [Option ID = 12214]

3. Mycorrhizaprime effect [Option ID = 12215]

4. Mycorrhizoplane effect [Option ID = 12216]

5) Which of the following method is used to stain endospore of bacteria?[Question ID = 3055][Question Description = 105\_159\_AMM\_SEP22\_Q05]

1. Schaeffer-Fulton method [Option ID = 12217]

2. Gray's method [Option ID = 12218]

3. Anthony's method [Option ID = 12219]

4. Hiss's method [Option ID = 12220]

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

Assertion A : MacConkey agar favours the growth of coliforms.

Reason R : It contains dyes plus sodium deoxycholate that allows selective growth of coliforms.

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

[Question ID = 3056][Question Description = 106\_159\_AMM\_SEP22\_Q06]

1. Both A and R are true and R is the correct explanation of A [Option ID = 12221]

2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 12222]

3. A is true but R is false [Option ID = 12223]

4. A is false but R is true [Option ID = 12224]

7) Match List I with List II

| List I           | List II                        |
|------------------|--------------------------------|
| Antibiotic       | Mode of action                 |
| A. Cephalosporin | Inhibitor of protein synthesis |

|                 |  |
|-----------------|--|
| B. Polyene      | II. Inhibitor of cell wall synthesis     |
| C. Streptomycin | III. Inhibitor of nucleic acid synthesis |
| D. Rifamycin    | IV. Disrupter of cell membranes          |

Choose the correct answer from the options given below:

[Question ID = 3057][Question Description = 107\_159\_AMM\_SEP22\_Q07]

1. A -II , B -I , C -IV , D -III [Option ID = 12225]
2. A -II , B -I , C -III , D -IV [Option ID = 12226]
3. A -IV , B -III , C -II , D -I [Option ID = 12227]
4. A -II , B -IV , C -I , D -III [Option ID = 12228]

8) Given below are two statements

Statement I: DNA polymerase from *Thermus aquaticus* (*Taq polymerase*) is more thermostable than DNA polymerase of *Pyrococcus furiosus* (*Pfu polymerase*).

Statement II: *Pfu polymerase* has good proofreading activity and more accurate over *Taq polymerase*.

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

[Question ID = 3058][Question Description = 108\_159\_AMM\_SEP22\_Q08]

1. Both Statement I and Statement II are true [Option ID = 12229]
2. Both Statement I and Statement II are false [Option ID = 12230]
3. Statement I is true but Statement II is false [Option ID = 12231]
4. Statement I is false but Statement II is true [Option ID = 12232]

9) In which of the following culture, all the bacterial cells grow in the same stage of growth cycle?

[Question ID = 3059][Question Description = 109\_159\_AMM\_SEP22\_Q09]

1. Batch culture [Option ID = 12233]
2. Continuous culture [Option ID = 12234]
3. Synchronous culture [Option ID = 12235]
4. Fed batch culture [Option ID = 12236]

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

Assertion A : In a medium containing glucose and another carbohydrate, bacteria use glucose preferentially.

Reason R : Glucose prevents entry of the second substrate by a process known as inducer exclusion and represses induction of the genes coding for the enzymes required for utilization of the second substrate.

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

[Question ID = 3060][Question Description = 110\_159\_AMM\_SEP22\_Q10]

1. Both A and R are true and R is the correct explanation of A [Option ID = 12237]
2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 12238]
3. A is true but R is false [Option ID = 12239]
4. A is false but R is true [Option ID = 12240]

11) Read the following statements regarding cyanobacteria-

- A. All are heterogeneous group of anoxygenic photosynthetic bacteria.
- B. Cell wall is similar to Gram negative bacteria and peptidoglycan is present in the cell wall.
- C. They produce chlorophyll and they also have characteristic biliprotein pigments.
- D. Heterocyst, a specialized nitrogen fixing cell of cyanobacteria possesses well developed photosystem-II.
- E. Akinetes are the special resting structures that protect cyanobacteria against adverse conditions.

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

[Question ID = 3061][Question Description = 111\_159\_AMM\_SEP22\_Q11]

1. B, C and D only [Option ID = 12241]
2. A, C and D only [Option ID = 12242]
3. B and C only [Option ID = 12243]
4. B, C and E only [Option ID = 12244]

12) RNA molecules with biocatalytic potential and function as enzymes are called\_\_\_\_\_.

[Question ID = 3062][Question Description = 112\_159\_AMM\_SEP22\_Q12]

1. Ribase [Option ID = 12245]
2. Riboplus [Option ID = 12246]
3. Ribozyme [Option ID = 12247]
4. Riboprime [Option ID = 12248]

13) Given below are two statements-

Statement I: *Allorhizobium undicola* forms symbiotic association with *Sesbania rostrata* for nitrogen fixation.

Statement II: *Frankia* sp. symbiotically fixes atmospheric nitrogen in association with *Paspalum notatum*.

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

[Question ID = 3063][Question Description = 113\_159\_AMM\_SEP22\_Q13]

1. Both Statement I and Statement II are true [Option ID = 12249]
2. Both Statement I and Statement II are false [Option ID = 12250]
3. Statement I is true but Statement II is false [Option ID = 12251]
4. Statement I is false but Statement II is true [Option ID = 12252]

14) Which of the following DNA replication process produce double helix consists of one complete "old" strand and complementary one complete "new" strand?

[Question ID = 3064][Question Description = 114\_159\_AMM\_SEP22\_Q14]

1. Dispersive [Option ID = 12253]
2. Semidispersive [Option ID = 12254]
3. Conservative [Option ID = 12255]
4. Semiconservative [Option ID = 12256]

15) Read the following statements regarding protein synthesis (Translation) process-

A. The message encoded in mRNA is translated into a sequence of amino acids at the ribosome.

B. The initial amino acid in the chain is always corresponding to the UAA start codon.

C. t-RNA acts as an adaptor, bearing at one end the complementary sequence for a particular triplet codon, and at the other the corresponding amino acid.

D. Enzymes called m-RNA synthetases ensure that each tRNA is coupled with the correct amino acid in an ATP-dependent process.

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

[Question ID = 3065][Question Description = 115\_159\_AMM\_SEP22\_Q15]

1. A, C and D only [Option ID = 12257]
2. A and C only [Option ID = 12258]
3. B and C only [Option ID = 12259]
4. B, C and D only [Option ID = 12260]

16) Given below are two statements

Statement I: Plasmid incompatibility is the property where two similar yet distinct plasmids might not be maintained in the same cell.

Statement II: If two plasmids produce similar repressor protein for replication initiation, then the repressor of one could regulate the replication of other plasmid and *vice versa*.

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

[Question ID = 3066][Question Description = 116\_159\_AMM\_SEP22\_Q16]

1. Both Statement I and Statement II are true [Option ID = 12261]
2. Both Statement I and Statement II are false [Option ID = 12262]
3. Statement I is true but Statement II is false [Option ID = 12263]
4. Statement I is false but Statement II is true [Option ID = 12264]

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

Assertion A : Base analogue 5-Bromouracil is a chemical mutagenic agent.

Reason R : It causes mutation by formation of pyrimidine dimer between two DNA strands.

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

[Question ID = 3067][Question Description = 117\_159\_AMM\_SEP22\_Q17]

1. Both A and R are true and R is the correct explanation of A [Option ID = 12265]
2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 12266]
3. A is true but R is false [Option ID = 12267]
4. A is false but R is true [Option ID = 12268]

18) Which of the following substrate is used in blue-white selection method during gene cloning?

[Question ID = 3068][Question Description = 118\_159\_AMM\_SEP22\_Q18]

1. Fructose [Option ID = 12269]
2. X-gal [Option ID = 12270]
3. X-fru [Option ID = 12271]
4. Raffinose [Option ID = 12272]

19) Read the following statements regarding humus-

- A. Humus is a light coloured substance that can be easily attacked by soil microorganisms.
- B. It improves water holding capacity and soil aeration.
- C. It is rich in inorganic matter and deficient in organic carbon.
- D. It improves chemical properties such as solubility and buffering capacity in soil.
- E. When virgin land put to agricultural use, their humus content increases drastically up to 40-50 years and then reaching a stable concentration.

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

[Question ID = 3069][Question Description = 119\_159\_AMM\_SEP22\_Q19]

1. A, C and D only [Option ID = 12273]
2. A, C and E only [Option ID = 12274]
3. B and C only [Option ID = 12275]
4. B and D only [Option ID = 12276]

20) In which of the following interaction between two organisms, one species of the pair benefits and the other remains unaffected?

[Question ID = 3070][Question Description = 120\_159\_AMM\_SEP22\_Q20]

1. Syntrophism [Option ID = 12277]
2. Commensalism [Option ID = 12278]
3. Mutualism [Option ID = 12279]
4. Antagonism [Option ID = 12280]

21) Given below are two statements-

Statement I: *Gluconoacetobacter* is a heterotrophic and obligate anaerobic nitrogen fixer.

Statement II: *Chromatium* is a phototrophic and obligate aerobic nitrogen fixer.

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

[Question ID = 3071][Question Description = 121\_159\_AMM\_SEP22\_Q21]

1. Both Statement I and Statement II are true [Option ID = 12281]
2. Both Statement I and Statement II are false [Option ID = 12282]
3. Statement I is true but Statement II is false [Option ID = 12283]
4. Statement I is false but Statement II is true [Option ID = 12284]

22) Given below are two statements-

Statement I: Water insoluble phosphate in soil remains unavailable for plants growth.

Statement II: Phosphate solubilizing microbes convert insoluble phosphate to soluble form and make it available for plants growth.

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

[Question ID = 3072][Question Description = 122\_159\_AMM\_SEP22\_Q22]

1. Both Statement I and Statement II are true [Option ID = 12285]
2. Both Statement I and Statement II are false [Option ID = 12286]
3. Statement I is true but Statement II is false [Option ID = 12287]
4. Statement I is false but Statement II is true [Option ID = 12288]



23) Read the following statements regarding fluorescent method of soil enzyme determination-

- A. It uses highly fluorescent compounds 4-methylumbelliferone (MUB) and 7-amino-4-methyl coumarin (AMC).
- B. Rapid but offers lower sensitivity over spectrophotometric determination.
- C. It cannot detect enzyme activities in small sized microaggregates.
- D. Only one sample can be analyzed at a time and automization is not effective.
- E. It can be used for determination of soil enzymes involved in nitrogen cycle, phosphorus cycle, carbon cycle, sulfur cycle, etc.

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

[Question ID = 3073][Question Description = 123\_159\_AMM\_SEP22\_Q23]

- 1. A, B and D only [Option ID = 12289]
- 2. A, C and D only [Option ID = 12290]
- 3. A and E only [Option ID = 12291]
- 4. A and D only [Option ID = 12292]

24) Commercially available Biolog bacterial identification system has been used to assess functional diversity of microorganisms, based on \_\_\_\_\_ principle.

[Question ID = 3074][Question Description = 124\_159\_AMM\_SEP22\_Q24]

- 1. Phage sensitivity [Option ID = 12293]
- 2. Antibiotics production [Option ID = 12294]
- 3. Immunological specificity [Option ID = 12295]
- 4. Utilization of carbon sources [Option ID = 12296]

25) Given below are two statements

Statement I: For quorum sensing, bacteria produce chemical molecules called an autoinducer or pheromone.

Statement II: Quorum sensing is highly specific in nature and only possible between two bacteria of same species.

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

[Question ID = 3075][Question Description = 125\_159\_AMM\_SEP22\_Q25]

- 1. Both Statement I and Statement II are true [Option ID = 12297]
- 2. Both Statement I and Statement II are false [Option ID = 12298]
- 3. Statement I is true but Statement II is false [Option ID = 12299]
- 4. Statement I is false but Statement II is true [Option ID = 12300]

26) In mycorrhizal mutual relationship, the penetrating hyphae forming dichotomously branched or coiled hyphal structure within the cells of plant's inner cortex is referred as \_\_\_\_\_.

[Question ID = 3076][Question Description = 126\_159\_AMM\_SEP22\_Q26]

- 1. Hyphopodium [Option ID = 12301]
- 2. Apoplast [Option ID = 12302]
- 3. Arbuscule [Option ID = 12303]
- 4. Myc factor [Option ID = 12304]

27) Read the following statements regarding type three secretion systems of bacteria-

- A. Type III secretion system (T3SS) is one step system because it forms channels through both inner and outer membranes.
- B. T3SS require both Sec and Tat systems.
- C. T3SS is used by Gram positive bacteria only.
- D. T3SS structure is referred as 'injectisome'.
- E. T3SS has similarity to a syringe in both structure and function.

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

[Question ID = 3077][Question Description = 127\_159\_AMM\_SEP22\_Q27]

- 1. A, C and D only [Option ID = 12305]
- 2. A, D and E only [Option ID = 12306]
- 3. C, D and E only [Option ID = 12307]
- 4. A, B and C only [Option ID = 12308]

28) Match List I with List II

| List I   | List II   |
|--|---|
| Genes / Its products                           | Proposed function                                   |
| A. NFR1 and NFR5                               | I. LCO backbone                                     |
| B. DMI1 and DMI2                               | II. Bacterial infection in root hair epidermal cell |
| C. <i>nodA</i> , <i>nodB</i> and <i>nodC</i>   | III. Glomus root infection                          |
| D. Cytokinin                                   | IV. Molecular switch                                |
| E. Calcium/calmodulin dependant protein kinase | V. Rhizobial infection and no nodule formation      |

Choose the correct answer from the options given below:

[Question ID = 3078][Question Description = 128\_159\_AMM\_SEP22\_Q28]

1. A - V , B - III , C - I , D - II , E - IV [Option ID = 12309]
2. A - V , B - I , C - IV , D - III , E - II [Option ID = 12310]
3. A - IV , B - V , C - II , D - III , E - I [Option ID = 12311]
4. A - IV , B - III , C - I , D - V , E - II [Option ID = 12312]

29) Given below are two statements-

Statement I: Mild heating may make the food safe, because staph enterotoxins are not stable at 60° C.

Statement II: Treatment of staph food poisoning with antibiotics is not useful, as antibiotics have no effect on the enterotoxins.

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

[Question ID = 3079][Question Description = 129\_159\_AMM\_SEP22\_Q29]

1. Both Statement I and Statement II are true [Option ID = 12313]
2. Both Statement I and Statement II are false [Option ID = 12314]
3. Statement I is true but Statement II is false [Option ID = 12315]
4. Statement I is false but Statement II is true [Option ID = 12316]

30) Given below are two statements-

Statement I: The coccus grows faster than the rod and it is responsible for initial acid production at higher rate in yoghurt production.

Statement II: More acetaldehyde is produced by *Lactobacillus delbrueckii* subsp. *bulgaricus* when growing in association with *Streptococcus salivarius* subsp. *thermophilus*.

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

[Question ID = 3080][Question Description = 130\_159\_AMM\_SEP22\_Q30]

1. Both Statement I and Statement II are true [Option ID = 12317]
2. Both Statement I and Statement II are false [Option ID = 12318]
3. Statement I is true but Statement II is false [Option ID = 12319]
4. Statement I is false but Statement II is true [Option ID = 12320]

31) Read the following statements regarding food safety systems-

A. Classical approaches to food safety rely heavily on testing raw materials.

B. HACCP is a proactive, systematic approach to controlling food borne hazards.

C. Prerequisite programs for HACCP implementation include GMP, personal hygiene of employees *etc* which are not part of HACCP.

D. HACCP system consists of 7 principles to control microbiological hazards in foods.

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

[Question ID = 3081][Question Description = 131\_159\_AMM\_SEP22\_Q31]

1. A, B and C only [Option ID = 12321]
2. B, C and D only [Option ID = 12322]
3. A, C and D only [Option ID = 12323]
4. A, B and D only [Option ID = 12324]

32) Read the following statements regarding heat processing of food-

A. D value is the decimal reduction time, or the time required to destroy 90% of the organisms.

B. z value refers to the degrees Fahrenheit required for the thermal destruction curve to traverse one log cycle.

C. D value is numerically equal to the number of minutes required for the thermal destruction curve to traverse one log cycle.

D. z value is equal to the reciprocal of the slope of the TDT curve.

E. z reflects the resistance of an organism to a specific temperature, while D provides information on the relative resistance of an organism to different destructive temperatures.

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

[Question ID = 3082][Question Description = 132\_159\_AMM\_SEP22\_Q32]

1. A, B and C only [Option ID = 12325]
2. B, C and D only [Option ID = 12326]
3. A, C and D only [Option ID = 12327]
4. A, B and D only [Option ID = 12328]

33) The chlorine residual level suitable for most drinking water supplies is \_\_\_\_\_.

[Question ID = 3083][Question Description = 133\_159\_AMM\_SEP22\_Q33]

1. 2-6 mg/l [Option ID = 12329]
2. 20-60 mg/l [Option ID = 12330]
3. 0.2-0.6 mg/l [Option ID = 12331]
4. 200-600 mg/l [Option ID = 12332]

34) Given below are two statements-

Statement I: A-factor ( $\gamma$ -butyrolactone) synthesized by *Streptomyces griseus* at a very low concentration ( $10^{-9}$  M) is required for streptomycin production and sporulation.

Statement II: 'Cluster-situated (transcriptional) regulators' (CSRs) are the focal point of a number of environmental stimuli involved in the onset of the synthesis of a secondary metabolite.

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

[Question ID = 3084][Question Description = 134\_159\_AMM\_SEP22\_Q34]

1. Both Statement I and Statement II are true [Option ID = 12333]
2. Both Statement I and Statement II are false [Option ID = 12334]
3. Statement I is true but Statement II is false [Option ID = 12335]
4. Statement I is false but Statement II is true [Option ID = 12336]

35) Vitamin B<sub>12</sub> is commercially produced by using \_\_\_\_\_.

[Question ID = 3085][Question Description = 135\_159\_AMM\_SEP22\_Q35]

1. *Ashbya gossypii* [Option ID = 12337]
2. *Blakeslea trispora* [Option ID = 12338]
3. *Pseudomonas denitrificans* [Option ID = 12339]
4. *Clostridium acetobutylicum* [Option ID = 12340]

36) Read the following statements regarding SCP-

A. Single cell protein is the microbial biomass that is produced for human or animal consumption.

B. Batch culture is the ideal method for the production of SCP.

C. In SCP processes, phosphoric acid is used as a flocculating agent.

D. Quorn™ products contain mycoprotein from the filamentous fungus *Fusarium venenatum*, is the SCP product exclusively used for human nutrition.

E. SCP derived from *Euglena* consists of hard cell walls and requires cell wall disruption to make it digestible.

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

[Question ID = 3086][Question Description = 136\_159\_AMM\_SEP22\_Q36]

1. A, B and C only [Option ID = 12341]
2. A, C and D only [Option ID = 12342]
3. A, D and E only [Option ID = 12343]
4. A, C and E only [Option ID = 12344]

37) Read the following statements regarding beer-

A. Beer is a distilled beverage made from malt by yeast fermentation.

- B. *Saccharomyces cerevisiae* is a top-fermenting yeast, used in lager beer fermentation.
- C. Lager is the beer made with bottom fermenting yeast (*Saccharomyces carlsbergensis*).
- D. Growth of brewing yeasts increases the pH of the medium.
- E. Beer is brewed using cylindro-conical fermenters worldwide.

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

[Question ID = 3087][Question Description = 137\_159\_AMM\_SEP22\_Q37]

1. A, B and C only [Option ID = 12345]
2. B, C and D only [Option ID = 12346]
3. C, D and E only [Option ID = 12347]
4. A, C and E only [Option ID = 12348]

38) According to Centers for Disease Control and Prevention (USA) classification of bioweapons, category C agents are \_\_\_\_\_.

[Question ID = 3088][Question Description = 138\_159\_AMM\_SEP22\_Q38]

1. Moderately easy to spread pathogens [Option ID = 12349]
2. Easy to disseminate pathogens [Option ID = 12350]
3. Emerging pathogens [Option ID = 12351]
4. Difficult to disseminate pathogens [Option ID = 12352]

39) Match List I with List II

| List I                            | List II                        |
|-----------------------------------|--------------------------------|
| Organism                          | Production / biodegradation of |
| A. <i>Ralstonia eutropha</i>      | I. Hydrocarbon                 |
| B. <i>Burkholderia</i>            | II. Bioplastics                |
| C. <i>Alcanivorax borkumensis</i> | III. PCBs                      |
| D. <i>Shewanella</i>              | IV. Herbicide (2,4,5-T)        |
| E. <i>Phanerochaete</i>           | V. Uraninite                   |

Choose the correct answer from the options given below:

[Question ID = 3089][Question Description = 139\_159\_AMM\_SEP22\_Q39]

1. A - II , B - V , C - IV , D - III , E - I [Option ID = 12353]
2. A - I , B - III , C - II , D - V , E - IV [Option ID = 12354]
3. A - II , B - IV , C - I , D - V , E - III [Option ID = 12355]
4. A - IV , B - III , C - V , D - II , E - I [Option ID = 12356]

40) Read the following statements regarding biofilm-

- A. Switch from planktonic to biofilm growth is triggered by cyclic di-GMP.
- B. Elevated c-di-GMP levels increases flagellar functions in *Pseudomonas aeruginosa*.
- C. *Pseudomonas fluorescens* does not form biofilms.
- D. Acyl homoserine lactones are major intercellular signalling molecules in *Pseudomonas aeruginosa*.
- E. In biofilm state, *Pseudomonas aeruginosa* is difficult to treat with antibiotics.

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

[Question ID = 3090][Question Description = 140\_159\_AMM\_SEP22\_Q40]

1. A, B and C only [Option ID = 12357]
2. B, C and D only [Option ID = 12358]
3. C, D and E only [Option ID = 12359]
4. A, D and E only [Option ID = 12360]

41) Read the following statements regarding biocontrol-

- A. *Trichoderma* winds around mycelia strands of the plant pathogens and by lytic action, penetrates their cell wall.
- B. Chitinase involved in the recognition between *Trichoderma* and pathogenic fungi.
- C. Production of 8-hydroxy linoleic acid by *Laetisaria arvalis* induces rapid control of *Pythium ultimum* and *rhizoctonia solani*.
- D. *Trichoderma* is a specific mycoparasite.

E. *Trichoderma* attack young, vigorously growing hyphae of the pathogen.

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

[Question ID = 3091][Question Description = 141\_159\_AMM\_SEP22\_Q41]

1. A, B and C only [Option ID = 12361]
2. A, C and D only [Option ID = 12362]
3. A, D and E only [Option ID = 12363]
4. C, D and E only [Option ID = 12364]

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

Assertion A : Tertiary aerobic waste water treatment employs a process called enhanced biological phosphorus removal, which removes about 90% of P by phosphorus accumulating bacteria.

Reason R : *Accumulibacter phosphatis* helps in stable operation of enhanced biological phosphorus removal process.

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

[Question ID = 3092][Question Description = 142\_159\_AMM\_SEP22\_Q42]

1. Both A and R are true and R is the correct explanation of A [Option ID = 12365]
2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 12366]
3. A is true but R is false [Option ID = 12367]
4. A is false but R is true [Option ID = 12368]

43) Determining the location and nature of genes or presumed genes on a newly sequenced genome is called\_\_\_\_\_.

[Question ID = 3093][Question Description = 143\_159\_AMM\_SEP22\_Q43]

1. Decoding [Option ID = 12369]
2. Microarray [Option ID = 12370]
3. Open reading frame [Option ID = 12371]
4. Annotation [Option ID = 12372]

44) Given below are two statements-

Statement I: The fungus *Phanerochaete chrysosporium* is also called as 'black rot fungi'.

Statement II: *Phanerochaete chrysosporium* has good potential to degrade benzene, toluene and xylene.

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

[Question ID = 3094][Question Description = 144\_159\_AMM\_SEP22\_Q44]

1. Both Statement I and Statement II are true [Option ID = 12373]
2. Both Statement I and Statement II are false [Option ID = 12374]
3. Statement I is true but Statement II is false [Option ID = 12375]
4. Statement I is false but Statement II is true [Option ID = 12376]

45) Read the following statements regarding fluorescent *in situ* hybridization-microautoradiography (FISH-MAR) -

- A. It gives idea pertaining to only phylogenetic diversity of microbes but not physiological details.
- B. It is a powerful technique for tracking specific bacterial populations at a single cell resolution.
- C. It could determine which organisms in a natural sample are metabolizing specific radio-labelled substance.
- D. The method is qualitative one and does not give any idea related to quantity of substrate consumed by cell(s).
- E. It could generate data for understanding activity of microbes in ecosystem.

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

[Question ID = 3095][Question Description = 145\_159\_AMM\_SEP22\_Q45]

1. A and D only  
[Option ID = 12377]
2. B, C and E only  
[Option ID = 12378]
3. A, D and E only  
[Option ID = 12379]
4. A, C and D only  
[Option ID = 12380]

46) Match List I with List II

| List I        | List II   |
|---------------|---|
| Technique     | Detection tool/principle                                      |
| A. FISH       | I. Fluorescent probe with enzyme conjugate                    |
| B. CARD-FISH  | II. DNA chips   |
| C. SIMS       | III. Fluorescent probe  |
| D. Microarray | IV. Ions released due to focused high energy primary ion beam |

Choose the correct answer from the options given below:

[Question ID = 3096][Question Description = 146\_159\_AMM\_SEP22\_Q46]

1. A - III , B - I , C - IV , D - II [Option ID = 12381]
2. A - III , B - IV , C - I , D - II [Option ID = 12382]
3. A - IV , B - III , C - I , D - II [Option ID = 12383]
4. A - II , B - III , C - IV , D - I [Option ID = 12384]

47) Which of the following is a measure of dispersion?[Question ID = 3097][Question Description = 147\_159\_AMM\_SEP22\_Q47]

1. Mean [Option ID = 12385]
2. Geometric mean [Option ID = 12386]
3. Arithmetic mean [Option ID = 12387]
4. Standard deviation [Option ID = 12388]

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

Assertion A : Correlation coefficient is good to know the strength of relationship between two continuous variables.

Reason R : Scatter diagram will give only a vague idea about the presence or absence of correlation.

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

[Question ID = 3098][Question Description = 148\_159\_AMM\_SEP22\_Q48]

1. Both A and R are true and R is the correct explanation of A [Option ID = 12389]
2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 12390]
3. A is true but R is false [Option ID = 12391]
4. A is false but R is true [Option ID = 12392]

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

Assertion A : Simple linear regression is straight line.

Reason R : Because it predicts the value of a dependent variable by incorporating a number of independent variables simultaneously.

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

[Question ID = 3099][Question Description = 149\_159\_AMM\_SEP22\_Q49]

1. Both A and R are true and R is the correct explanation of A [Option ID = 12393]
2. Both A and R are true but R is NOT the correct explanation of A [Option ID = 12394]
3. A is true but R is false [Option ID = 12395]
4. A is false but R is true [Option ID = 12396]

50) Match List I with List II

| List I  | List II                                      |
|---|--|
| (Statistical attribute)                                   | (Corresponds to)                             |
| A. Paired distribution                                    | I. Z, t and Chi-square test                  |
| B. Test statistics  | II. Direction of the difference is known     |
| C. Two-tailed test ( $\mu_1 \neq \mu_2$ )                 | III. Shapiro-Wilk                            |
| D. One-tailed test ( $\mu_1 > \mu_2$ or $\mu_1 < \mu_2$ ) | IV. Direction of the difference is not known |
| E. Test of normality                                      | V. Comparing two sets                        |

Choose the correct answer from the options given below:

[Question ID = 3100][Question Description = 150\_159\_AMM\_SEP22\_Q50]

1. A - II , B - V , C - IV , D - III , E - I [Option ID = 12397]
2. A - I , B - III , C - II , D - V , E - IV [Option ID = 12398]
3. A - II , B - IV , C - I , D - V , E - III [Option ID = 12399]
4. A - V , B - I , C - IV , D - II , E - III [Option ID = 12400]

