

DU PhD in Environmental Studies

Topic:- ES PHD

1) In a forest, a wolf was hunted to extinction. Consequently, the populations of deer and other herbivores increased explosively. As these herbivores overgrazed the vegetation, many plant species that could not tolerate such grazing pressure disappeared. Many smaller animals such as insects were lost from the ecosystem because the plants they depended on for food were now less abundant. Wolves in this ecosystem are an example of:[Question ID = 8983]

1. Flagship species [Option ID = 35929]
2. Umbrella species [Option ID = 35930]
3. Indicator species [Option ID = 35931]
4. Keystone species [Option ID = 35932]

2) The water system is unsuitable for aquatic life when the concentration of dissolved oxygen is less than:[Question ID = 8984]

1. 40 ppm [Option ID = 35933]
2. 4 ppm [Option ID = 35934]
3. 10 ppm [Option ID = 35935]
4. 100 ppm [Option ID = 35936]

3) The carbon dioxide acidity and the mineral acid acidity can be determined by the titration method using the indicator:[Question ID = 8985]

1. Methylene blue [Option ID = 35937]
2. Acetocarmine [Option ID = 35938]
3. Indigo carmine [Option ID = 35939]
4. Phenolphthalein [Option ID = 35940]

4) Which of the following geological movements does not cause Tsunami?[Question ID = 8986]

1. Fault movements on the seafloor [Option ID = 35941]
2. Landslide occurring underwater [Option ID = 35942]
3. Volcanic activity [Option ID = 35943]
4. Flood tides [Option ID = 35944]

5) An analyst was given a standard reference material (SRM) and was asked to determine its zinc concentration (in mg/kg) in a soil sample using the EPA standard method. Following results were obtained for the duplicate samples; 47 mg/L and 45 mg/L. Calculate the Relative Percent Difference.[Question ID = 8987]

1. 4.34 [Option ID = 35945]
2. 2.17 [Option ID = 35946]
3. 0 [Option ID = 35947]
4. 1.0 [Option ID = 35948]

6) Which of the following are characteristic features of basic research?

- A. It focuses on accumulating knowledge
- B. It aims for a better understanding of some phenomenon
- C. Mostly, the results have immediate benefits for the application
- D. Generally, it is the first step in moving toward applied research

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

[Question ID = 8988]

1. A, B and C only
[Option ID = 35949]
2. B, C and D only
[Option ID = 35950]
3. A, C and D only
[Option ID = 35951]
4. A, B and D only
[Option ID = 35952]

7) Which of the following characteristics can be referred to as categorical data?

- A. Sex chromosome genotype (e.g., XX, XY, XO, XXY, or XYY)
- B. Method of disease transmission (e.g., water, air, animal vector, or direct contact)
- C. Chromosome length (in millimetre or nanometre)

D. Body temperature (in degree Celsius or Fahrenheit)

E. Snakebite severity score (e.g., minimal severity, moderate severity, or very severe)

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

[Question ID = 8989]

1. A, B and C only

[Option ID = 35953]

2. B, C and D only

[Option ID = 35954]

3. A, B and E only

[Option ID = 35955]

4. B, D and E only

[Option ID = 35956]

8) Which amongst these are not Data Quality Indicators?

A. Accuracy

B. Representativeness

C. Multivariate analyses

D. Hypothesis testing

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

[Question ID = 8990]

1. A and B only

[Option ID = 35957]

2. B and C only

[Option ID = 35958]

3. C and D only

[Option ID = 35959]

4. A and D only

[Option ID = 35960]

9) The main disadvantages of seed banks are:

A. Seeds are likely to remain alive indefinitely

B. Growing, harvesting, and returning seeds to storage are expensive

C. Accidents like fire or a power failure may lead to permanent loss of genetic diversity

D. Seeds stored in this manner remain stagnant in an evolutionary sense

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

[Question ID = 8991]

1. A, B and C only

[Option ID = 35961]

2. B, C and D only

[Option ID = 35962]

3. A, C and D only

[Option ID = 35963]

4. A, B and D only

[Option ID = 35964]

10) In experiment to determine the total carbon dioxide production of an animal by using double-labelled water, which of the following results are expected?

A. Heavy isotope of hydrogen is eliminated only as water

B. Heavy isotope of hydrogen is not eliminated as water

C. Heavy isotope of oxygen is eliminated both as carbon dioxide and as water

D. Heavy isotope of oxygen is eliminated only as carbon dioxide

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

[Question ID = 8992]

1. B and D only

[Option ID = 35965]

2. A and B only

[Option ID = 35966]

3. A and C only

[Option ID = 35967]

4. B and C only

[Option ID = 35968]

11) There are two broad categories of data problems that emerge through exploratory analysis.

A. Irregularities in the distribution of observations

B. Regularities in the distribution of observations

C. Inter-relationships between individual observations

D. No relationships between the observation

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

[Question ID = 8993]

1. A and C only

[Option ID = 35969]

2. B and C only

[Option ID = 35970]

3. C and D only

[Option ID = 35971]

4. A and D only

[Option ID = 35972]

12) In a forest with five warbler species, a researcher observes that the individuals of each species spend most of their feeding time in different parts of the trees. They also travel differently in the tree canopy, consume different combinations of insects, and nest at slightly different times. Such an arrangement is an example of: [Question ID = 8994]

1. Competitive exclusion [Option ID = 35973]

2. Resource partitioning [Option ID = 35974]

3. Character displacement [Option ID = 35975]

4. Oscillating populations [Option ID = 35976]

13) Which of the following statements is correct for the goals of sampling?[Question ID = 8995]

1. To increase the accuracy and precision of estimates and to ensure that it is possible to quantify precision [Option ID = 35977]

2. To increase the accuracy of estimates with low precision and to ensure that it is possible to quantify precision [Option ID = 35978]

3. To increase the accuracy and precision of estimates because it is possible to quantify the precision [Option ID = 35979]

4. To decrease the accuracy of estimates with high precision and to ensure that it is possible to quantify precision [Option ID = 35980]

14) *Daphnia magna* immobilization test, a short-duration assay is an example of:

[Question ID = 8996]

1. Acute toxicity assay

[Option ID = 35981]

2. Chronic toxicity assay

[Option ID = 35982]

3. Carcinogenic toxicity assay

[Option ID = 35983]

4. Allergy toxicity assay

[Option ID = 35984]

15) Which of the following gases is used as a carrier in gas chromatography?[Question ID = 8997]

1. Helium [Option ID = 35985]

2. Oxygen [Option ID = 35986]

3. Carbon dioxide [Option ID = 35987]

4. Carbon monoxide [Option ID = 35988]

16) The term used for changes in gene frequencies in populations or species over time is: [Question ID = 8998]

1. Natural selection [Option ID = 35989]

2. Evolution [Option ID = 35990]

3. Ecology [Option ID = 35991]

4. Recombination [Option ID = 35992]

17) Given below are two statements

Statement I: Median and mean measure different aspects of the location of a distribution.

Statement II: The mean is the middle value of the data, whereas the median is its center of gravity.

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



[Question ID = 8999]

1. Both Statement I and Statement II are correct

[Option ID = 35993]

2. Both Statement I and Statement II are incorrect

[Option ID = 35994]

3. Statement I is correct but Statement II is incorrect

[Option ID = 35995]

4. Statement I is incorrect but Statement II is correct

[Option ID = 35996]

18) Given below are two statements

Statement I: An industrial ecosystem may consist of an electric power plant, an oil refinery, a pharmaceutical plant, a wallboard factory, a sulfuric acid producer, a cement manufacturer, fish farming, horticulture (greenhouses), and area homes and farms, where the wastes produced by one company are sold to another company as raw materials for their processes.

Statement II: Industrial ecosystems compare in many ways to natural ecosystems as here, the different entities are linked to one another in ways that resemble a food web.

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

[Question ID = 9000]

1. Both Statement I and Statement II are correct

[Option ID = 35997]

2. Both Statement I and Statement II are incorrect

[Option ID = 35998]

3. Statement I is correct but Statement II is incorrect

[Option ID = 35999]

4. Statement I is incorrect but Statement II is correct

[Option ID = 36000]

19) Given below are two statements

Statement I: As soon as the water sample is brought to the laboratory, its pH should not be determined immediately.

Statement II: The delay in pH measurements may involve change in the pH value of the sample because of absorption of laboratory fumes, loss of dissolved gases and chemical changes.

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

[Question ID = 9001]

1. Both Statement I and Statement II are correct

[Option ID = 36001]

2. Both Statement I and Statement II are incorrect

[Option ID = 36002]

3. Statement I is correct but Statement II is incorrect

[Option ID = 36003]

4. Statement I is incorrect but Statement II is correct

[Option ID = 36004]

20) Given below are two statements

Statement I: The advantage of pyrolysis is that, the metals get oxidized and hence have high commercial value.

Statement II: The disadvantage of pyrolysis is that the products cannot be disposed without further treatment.

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

[Question ID = 9002]

1. Both Statement I and Statement II are correct

[Option ID = 36005]

2. Both Statement I and Statement II are incorrect

[Option ID = 36006]

3. Statement I is correct but Statement II is incorrect

[Option ID = 36007]

4. Statement I is incorrect but Statement II is correct

[Option ID = 36008]

21) Given below are two statements

Statement I: Captive breeding is the process of breeding animals inside the natural habitats of those organisms.

Statement II: Cryopreservation is a technique where cell vulnerable to damage caused by time are preserved by cooling to sub-zero temperature.

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

[Question ID = 9003]

- Both Statement I and Statement II are correct
[Option ID = 36009]
- Both Statement I and Statement II are incorrect
[Option ID = 36010]
- Statement I is correct but Statement II is incorrect
[Option ID = 36011]
- Statement I is incorrect but Statement II is correct
[Option ID = 36012]

22) Given below are two statements

Statement I: The disposal of radioactive wastes by dilution method is adopted for high-level radioactive wastes.

Statement II: The delay and decay method is generally employed for only low-level radioactive waste.

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

[Question ID = 9004]

- Both Statement I and Statement II are correct
[Option ID = 36013]
- Both Statement I and Statement II are incorrect
[Option ID = 36014]
- Statement I is correct but Statement II is incorrect
[Option ID = 36015]
- Statement I is incorrect but Statement II is correct
[Option ID = 36016]

23) Which of the following statements explains the concept of 'Skew' in statistics?[Question ID = 9005]

- Asymmetry in the shape of a frequency distribution for a numerical variable [Option ID = 36017]
- Symmetry in the shape of a frequency distribution for a numerical variable [Option ID = 36018]
- Asymmetry in the shape of a frequency distribution for a categorical variable [Option ID = 36019]
- An observation well outside the range of values of other observations in the data set [Option ID = 36020]

24) In mass spectrometry, ions separation is based on[Question ID = 9006]

- Mass [Option ID = 36021]
- Charge [Option ID = 36022]
- Mass to charge ratio [Option ID = 36023]
- weight [Option ID = 36024]

25) In toxicology, we identify a group of people who have been exposed to a suspected risk factor and then compare their health with that of a control group who are as nearly identical as possible to the experimental group, except for exposure to that particular factor. Such studies are known as[Question ID = 9007]

- Prospective study [Option ID = 36025]
- Cross-sectional study [Option ID = 36026]
- Longitudinal study [Option ID = 36027]
- Retrospective case-control study [Option ID = 36028]

26) Which of the following statements is 'incorrect' related to the constructed wetland systems?

[Question ID = 9008]

- It can be designed with endless varieties, but all filter water through a combination of beneficial microorganisms and plants
[Option ID = 36029]
- Anaerobic bacteria convert nitrate to nitrogen gas and organic molecules to methane
[Option ID = 36030]
- Aerobic bacteria convert ammonium to nitrate; green plants and algae take up nutrients
[Option ID = 36031]
- Water leaving the system is clean, and it never requires disinfection from chlorine or ozone or ultraviolet light
[Option ID = 36032]

27) A chemical communication system that is widespread in prokaryotes and is used by bacteria to detect one another and to coordinate gene expression among neighbouring microbial populations is most appropriately known as[Question ID = 9009]

- Quorum sensing [Option ID = 36033]
- Gene regulation [Option ID = 36034]

3. Expression profiling [Option ID = 36035]
4. Community profiling [Option ID = 36036]

28) Match List I with List II

List I	List II
Soil horizon	Characteristic feature
A. Horizon-A	I. Contains plant litter that gradually decays
B. Horizon-B	II. Weathered pieces of rock and borders the unweathered solid parent material
C. Horizon-C	III. Accumulate nutrient minerals that leached out of the topsoil and litter
D. Horizon-O	IV. The topsoil

Choose the correct answer from the options given below:

[Question ID = 9010]

1. A - IV, B - III, C - II, D - I [Option ID = 36037]
2. A - IV, B - I, C - III, D - II [Option ID = 36038]
3. A - IV, B - III, C - I, D - II [Option ID = 36039]
4. A - I, B - II, C - III, D - IV [Option ID = 36040]

29) Match List I with List II

List I	List II
Plastic identification code	Types of plastic polymer
A. 01	I. LDPE
B. 02	II. PVC
C. 03	III. HDPE
D. 04	IV. PET

Choose the correct answer from the options given below:

[Question ID = 9011]

1. A - III, B - IV, C - I, D - II [Option ID = 36041]
2. A - IV, B - III, C - II, D - I [Option ID = 36042]
3. A - IV, B - II, C - III, D - I [Option ID = 36043]
4. A - I, B - IV, C - III, D - II [Option ID = 36044]

30) Match List I with List II

List I	List II
Concept	Definition
A. Risk management	I. Process by which the ecological consequences of a range of human-induced stressors are estimated
B. Risk assessment	II. A method for assigning the responsibility for harm to multiple causes, where each cause is assigned a fraction or percent of the responsibility based on its relative contribution to the harm
C. Ecological risk assessment	III. Process of identifying, assessing, and reducing risks
D. Fractional risk attribution	IV. Using statistical methods to quantify the risks of a particular action so that these risks can be compared and contrasted with other risks

Choose the correct answer from the options given below:

[Question ID = 9012]

1. A - III, B - IV, C - I, D - II [Option ID = 36045]
2. A - IV, B - III, C - II, D - I [Option ID = 36046]
3. A - IV, B - II, C - III, D - I [Option ID = 36047]
4. A - I, B - IV, C - III, D - II [Option ID = 36048]

31) Match List I with List II

List I	List II
Process	Explanation
A. Exploitation competition	I. Individuals of one species release toxins that harm to other species
B. Interference competition	II. Individuals reduce the supply of a shared resource as they use it
C. Allelopathy	III. A dominant species prevents another species from using essential resources, the inferior species may become locally extinct
D. Competitive exclusion	IV. One plant species grows over another, reducing its access to light

Choose the correct answer from the options given below:

[Question ID = 9013]

1. A - II, B - III, C - I, D - IV [Option ID = 36049]
2. A - IV, B - III, C - II, D - I [Option ID = 36050]
3. A - IV, B - II, C - I, D - III [Option ID = 36051]
4. A - II, B - IV, C - I, D - III [Option ID = 36052]

32) Identify the incorrect statement in respect of earthquake.[Question ID = 9014]

1. P and S waves are body waves [Option ID = 36053]
2. The energy released as seismic waves increases even more with earthquake magnitude, by a factor of 33 for each Richter unit [Option ID = 36054]
3. Modified Mercalli intensity scale has values from I to X [Option ID = 36055]
4. Love waves and Rayleigh waves are surface waves [Option ID = 36056]

33) A large degree of uncertainty exists in radiative forcing estimates of[Question ID = 9015]

1. Greenhouse gases [Option ID = 36057]
2. Short-lived gases [Option ID = 36058]
3. Atmospheric aerosols [Option ID = 36059]
4. Long-lived gases [Option ID = 36060]

34) The number of offspring born per female per unit time is known as[Question ID = 9016]

1. Crude density [Option ID = 36061]
2. Natality [Option ID = 36062]
3. Allelopathy [Option ID = 36063]
4. Biotic potential [Option ID = 36064]

35) Variability, plasticity, and even epigenetic changes fall within the realm of[Question ID = 9017]

1. Radiation [Option ID = 36065]
2. Divergence [Option ID = 36066]
3. Microevolutionary change [Option ID = 36067]
4. Macroevolutionary change [Option ID = 36068]

36) The acquisition of sequence data from the RNA produced in a given tissue, usually mRNA derived from expressed genes, is referred to as:[Question ID = 9018]

1. Metagenomics [Option ID = 36069]
2. Metabolomics [Option ID = 36070]
3. Transcriptomics [Option ID = 36071]
4. Genomics [Option ID = 36072]

37) Arrange the following land uses in decreasing order of global land area covered:

- A. Forests and grasslands
- B. Snow or bare rock
- C. Cropland
- D. Urban

Choose the *correct* answer from the options given below

[Question ID = 9019]

1. A>B>C>D
[Option ID = 36073]
2. B>C>D>A
[Option ID = 36074]
3. C>D>A>B
[Option ID = 36075]
4. D>A>B>C
[Option ID = 36076]

38) Arrange the following in the correct chronological order, from the earliest to the most recent in a magnetic time scale.

- A. Gilbert reverse chron
- B. Gauss normal chron
- C. Matuyama reverse chron
- D. Brunhes normal chron

Choose the *correct* answer from the options given below

[Question ID = 9020]

1. A, B, C, D
[Option ID = 36077]
2. B, C, A, D
[Option ID = 36078]
3. A, C, B, D
[Option ID = 36079]
4. B, D, A, C
[Option ID = 36080]

39) Arrange the steps during plant-metal interaction, in a sequence of its occurrence from initial to final steps

- A. Bioavailability in soil
- B. Compartmentalization in leaves
- C. Root uptake
- D. Vascular translocation

Choose the *correct* answer from the options given below

[Question ID = 9021]

1. A, B, C, D

[Option ID = 36081]

2. A, C, B, D

[Option ID = 36082]

3. A, C, D, B

[Option ID = 36083]

4. A, B, D, C

[Option ID = 36084]

40) James Lovelock proposed that Earth's biogeochemical cycles are biologically driven, and that on any planet which supports life conditions favourable to life are maintained biologically. This hypothesis is popularly known as:[Question ID = 9022]

- 1. Gaia hypothesis [Option ID = 36085]
- 2. Monoclimax hypothesis [Option ID = 36086]
- 3. Tangled Bank hypothesis [Option ID = 36087]
- 4. Thornthwaite hypothesis [Option ID = 36088]

41) Which of the following Indian government body issue an early warning for disaster?[Question ID = 9023]

- 1. CPCB [Option ID = 36089]
- 2. IMD [Option ID = 36090]
- 3. DRDO [Option ID = 36091]
- 4. NDRF [Option ID = 36092]

42) An increase of clutch size imposes a cost to chick mortality is a typical example of:[Question ID = 9024]

- 1. Retrogressive evolution [Option ID = 36093]
- 2. Trade-off [Option ID = 36094]
- 3. Mutation [Option ID = 36095]
- 4. Ecological success [Option ID = 36096]

43) The strip chart is used for the graphical display of :[Question ID = 9025]

- 1. A numerical variable and a categorical variable in which each observation is represented as a dot [Option ID = 36097]
- 2. A numerical variable without a categorical variable in which each observation is represented as a dot [Option ID = 36098]
- 3. A categorical variable without a numerical variable in which each observation is represented as a dot [Option ID = 36099]
- 4. The median, quartiles, range, and extreme measurements of the data using lines and a rectangular box [Option ID = 36100]

44) As per the emissions trading mechanism to control greenhouse gases, the first step is to mandate _____ on how much each country, sector, or specific industry is allowed to emit. Companies that can cut pollution by more than they are required to can sell _____ to other companies that have more difficulty meeting their mandated levels.

[Question ID = 9026]

- 1. The cap, carbon credits [Option ID = 36101]
- 2. Lower limits, carbon products [Option ID = 36102]
- 3. Carbon credits, carbon products [Option ID = 36103]
- 4. Limit gases, carbon dioxide [Option ID = 36104]

45) In a water body, if fish need to ventilate its gills more frequently than usual to obtain enough oxygen, then it is likely that [Question ID = 9027]

- 1. Due to the release of cooled industrial effluent, the average temperature of the waterbody is decreased, resulting in less dissolved oxygen [Option ID = 36105]
- 2. Due to the release of cooled industrial effluent, the average temperature of the waterbody is decreased, resulting in more dissolved oxygen [Option ID = 36106]
- 3. Due to the release of heated industrial effluent, less oxygen is dissolved in the water body [Option ID = 36107]
- 4. Due to the release of heated industrial effluent, more oxygen is dissolved in the water body [Option ID = 36108]

46) Given below are two statements :

Statement I : Interaction between the plate tectonic system (uplift of rocks) and climate system (weathering of uplifted rocks) results in the transformation of igneous and metamorphic rocks into loose sediment that erosion then strips away.

Statement II : Any type of rock—igneous, sedimentary, or metamorphic—can be uplifted during a mountain-building event and weathered and eroded to form new sediments.

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

[Question ID = 9028]

1. Both Statement I and II are correct

[Option ID = 36109]

2. Both Statement I and II are incorrect

[Option ID = 36110]

3. Statement I is correct but statement II is incorrect

[Option ID = 36111]

4. Statement I is incorrect but Statement II is correct

[Option ID = 36112]

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

Assertion A : As a first step in water treatment, some municipal water supplies are drawn from beneath the surface of natural or artificial river banks.

Reason R : Binding of xenobiotic with humic substances reduce the mobility of toxicants. Subsequent uptake of organic matter by suspended and sedimentary material in water may significantly reduce toxicity in water.

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

[Question ID = 9029]

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

[Option ID = 36113]

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

[Option ID = 36114]

3. A is true but R is false

[Option ID = 36115]

4. A is false but R is true

[Option ID = 36116]

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

Assertion A: Many kinds of aquatic organisms cannot exist in water without an appreciable level of dissolved oxygen.

Reason R: The solubility of oxygen in water does not depend on water temperature, the partial pressure of oxygen in the atmosphere and the salt content of the water.

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

[Question ID = 9030]

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

[Option ID = 36117]

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

[Option ID = 36118]

3. A is correct but R is not correct

[Option ID = 36119]

4. A is not correct but R is correct

[Option ID = 36120]

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

Assertion A: The global warming potential (GWP) of CO₂ is the highest among all Green House Gases (GHGs).

Reason R: The GWP of GHGs depends on the absorption of IR radiation and their residence time.

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

[Question ID = 9031]

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

[Option ID = 36121]

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

[Option ID = 36122]

3. A is correct but R is not correct

[Option ID = 36123]

4. A is not correct but R is correct

[Option ID = 36124]

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

Assertion A: In a random sample, each member of a population has an equal and independent chance of being selected.

Reason R: Random sampling minimizes bias and makes it possible to measure the amount of sampling error.

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

[Question ID = 9032]

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

[Option ID = 36125]

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

[Option ID = 36126]

3. A is correct but R is not correct

[Option ID = 36127]

4. A is not correct but R is correct

[Option ID = 36128]