Topic:- ES PHD S2

1) For an asymmetrical right skewed frequency distribution, the measures of central tendency will show which of the following patterns:
[Question ID = 1330]
1. mean > median > mode [Option ID = 5314]
2. median > mode > mean [Option ID = 5315]
3. mode > median > mean [Option ID = 5316]
4. mode = median = mean [Option ID = 5317]

Correct Answer :-
- mean > median > mode [Option ID = 5314]

2) A graphical representation shows that increasing sampling effort initially has a direct influence on the numbers of species detected at a given site, but this declines and eventually becomes asymptotic. What is this graph called?
[Question ID = 1331]
1. Diversity-area curve [Option ID = 5318]
2. J-curve [Option ID = 5319]
3. S-curve [Option ID = 5320]
4. Species-area curve [Option ID = 5321]

Correct Answer :-
- Species-area curve [Option ID = 5321]

3) Additional warming caused by methane released from decomposition of organic material in permafrost that has melted due to global warming is considered as an example of:
[Question ID = 1332]
1. a positive feedback loop [Option ID = 5322]
2. a negative feedback loop [Option ID = 5323]
3. climate forcing [Option ID = 5324]
4. sublimation [Option ID = 5325]

Correct Answer :-
- a positive feedback loop [Option ID = 5322]

4) A researcher observes aggressive behaviour for a sample of monkeys (n = 15) and classifies each monkey as high, medium, or low in terms of aggression. If the frequency distribution for these scores is presented in a graph, what kind of graph would be appropriate?

[Question ID = 1333]
1. A bar graph

   [Option ID = 5326]
2. A polygon

   [Option ID = 5327]
3. A histogram

   [Option ID = 5328]
4. All of these

   [Option ID = 5329]

Correct Answer :-
- A bar graph

  [Option ID = 5326]

5) Two species of birds found on two different islands in an archipelago have identical beak sizes and eat similar seeds. What can you predict about evolution of beak size if you translocate both the species to a new island that was not inhabited by similar birds?

[Question ID = 1334]
1. 1) The beak sizes of both species would eventually diverge from each other and from their original sizes

   [Option ID = 5330]
2. 2) The beak size of one of the species would not change

   [Option ID = 5331]
3. 3) There would be no change in the beaks of either species

[Option ID = 5332]
4. (1 and 2)
[Option ID = 5333]

Correct Answer :-

- 1) The beak sizes of both species would eventually diverge from each other and from their original sizes

[Option ID = 5330]

6) What is the measure of statistical dispersion that includes the middle 50% of measurements or a range of measurements equal to the difference between upper and lower quartiles called?

[Question ID = 1335]

1. 50% confidence interval [Option ID = 5334]
2. Interquartile range [Option ID = 5335]
3. Standard deviation [Option ID = 5336]
4. Standard error [Option ID = 5337]

Correct Answer :-

- Interquartile range [Option ID = 5335]

7) Which of the following measurements is likely to show a normal distribution?

[Question ID = 1336]

1. Body length [Option ID = 5338]
2. Exponential rates of litter decay [Option ID = 5339]
3. Proportions of different species in a community [Option ID = 5340]
4. Percentage of time an animal spends foraging [Option ID = 5341]

Correct Answer :-

- Body length [Option ID = 5338]

8) A *t*-test compares which of the following?

[Question ID = 1337]

1. Correlation

   [Option ID = 5342]
2. Mean

   [Option ID = 5343]
3. Median

   [Option ID = 5344]
4. Normal distribution

   [Option ID = 5345]

Correct Answer :-

- Mean

  [Option ID = 5343]

9) Which of the following tests is used to judge how well an observed frequency distribution matches the expected?

[Question ID = 1338]

1. Chi-square

   [Option ID = 5346]
2. Degree of freedom

   [Option ID = 5347]
3. Null hypothesis

   [Option ID = 5348]
4. *t*-test

   [Option ID = 5349]

Correct Answer :-

- Chi-square

  [Option ID = 5346]

10) The _____ is the number of values we can pick freely without being constrained by other values within a set.

[Question ID = 1339]

1. Chi-square value [Option ID = 5350]
2. degrees of freedom [Option ID = 5351]
3. expected value [Option ID = 5352]
4. level of significance [Option ID = 5353]

Correct Answer :-
- ees of freedom [Option ID = 5351]

11) What percentage of the observations fall within three standard deviations of the mean in a normal distribution?
[Question ID = 1340]
1. 31.7% [Option ID = 5354]
2. 68.3% [Option ID = 5355]
3. 95.5% [Option ID = 5356]
4. 99.7% [Option ID = 5357]

Correct Answer :-
- 99.7% [Option ID = 5357]

12) What is the brief summary found at the beginning of most research reports known as?
[Question ID = 1341]
1. Abstract [Option ID = 5358]
2. Introduction [Option ID = 5359]
3. Preface [Option ID = 5360]
4. Synopsis [Option ID = 5361]

Correct Answer :-
- Abstract [Option ID = 5358]

13) The hypothesis of a study should be stated in which section of a research report?
[Question ID = 1342]
1. Introduction [Option ID = 5362]
2. Method [Option ID = 5363]
3. References [Option ID = 5364]
4. Results [Option ID = 5365]

Correct Answer :-
- Introduction [Option ID = 5362]

14) What does the steep slope of a rank-abundance plot indicate?
[Question ID = 1343]
1. Greater abundance of dominant species in the community [Option ID = 5366]
2. Greater abundance of rare species in the community [Option ID = 5367]
3. Greater dominance of common species over rare species in the community [Option ID = 5368]
4. Greater dominance of rare species over common species in the community [Option ID = 5369]

Correct Answer :-
- Greater dominance of common species over rare species in the community [Option ID = 5368]

15) What does the term (P_i) in the Shannon-Wiener index indicate?

[Question ID = 1344]
1. Distribution of vegetative biomass among vertical layers

   [Option ID = 5370]
2. Number of species in the community

   [Option ID = 5371]
3. Proportion of each species in the community

   [Option ID = 5372]
4. Proportion of vegetative biomass among vertical layer

   [Option ID = 5373]

Correct Answer :-
- Proportion of each species in the community

  [Option ID = 5372]

16) A scientist captures 20 deer in an area, marks them with collars, and releases them. Two months later the scientist captures 20 deer in the same area and notes that 10 of the deer have collars. Based on this capture-recapture experiment, how many deer are in the area?
[Question ID = 1345]
1. 20 [Option ID = 5374]
2. 40 [Option ID = 5375]
3. 200 [Option ID = 5376]
4. 400 [Option ID = 5377]

Correct Answer :-
- 40 [Option ID = 5375]

The principle of island biogeography states that species richness in an island results from:
[Question ID = 1346]

1. equilibrium between extinction and colonization [Option ID = 5378]
2. the distance of the island from the mainland [Option ID = 5379]
3. the type of organism [Option ID = 5380]
4. the size of the island [Option ID = 5381]

Correct Answer :-

- the equilibrium between extinction and colonization [Option ID = 5378]

18) Biodiversity is important for many reasons, one of which is its usefulness to people and the economy as a source of food, medicine, materials, or energy. What term is used for this kind of biodiversity value?
[Question ID = 1347]

1. Aesthetic value [Option ID = 5382]
2. Extrinsic value [Option ID = 5383]
3. Instrumental value [Option ID = 5384]
4. Intrinsic value [Option ID = 5385]

Correct Answer :-

- Instrumental value [Option ID = 5384]

19) Ozone hole is the thinning of ozone layer over the polar caps. This phenomenon is observed throughout the year, however, the degree of ozone damage varies with seasons. Ozone layer is most severely damaged during which part of the year in the Antarctic?

[Question ID = 1348]

1. Spring

   [Option ID = 5386]
2. Summers

   [Option ID = 5387]
3. Winters

   [Option ID = 5388]
4. None of these

   [Option ID = 5389]

Correct Answer :-

- Spring

  [Option ID = 5386]

20) Which of the following is the correct sequence of IUCN Red List of Threatened species for the worldwide conservation status of species from low risk to highest risk?
[Question ID = 1349]

1. LC-NT-VU-EN-CR [Option ID = 5390]
2. LC-NT-EN-VU-CR [Option ID = 5391]
3. CR-EN-VU-NT-LC [Option ID = 5392]
4. CR-EN-VU-LC-NT [Option ID = 5393]

Correct Answer :-

- LC-NT-VU-EN-CR [Option ID = 5390]

21) When two variables are positively correlated, increase in values of *x* is associated with _____in values of *y* variable.

[Question ID = 1350]

1. decrease

   [Option ID = 5394]
2. increase

   [Option ID = 5395]
3. no change

   [Option ID = 5396]
4. random change

   [Option ID = 5397]

Correct Answer :-

- increase

  [Option ID = 5395]

22) What is the difference between a proximate and an ultimate explanation of an ecological phenomenon?

[Question ID = 1351]

1. ...irst depends on an evolutionary explanation, the second on a predictive explanation [Option ID = 5398]
2. ...irst depends on factors operating at the present time, the second on an evolutionary explanation [Option ID = 5399]
3. The first depends on a mathematical model, the second on observations [Option ID = 5400]
4. The first depends on a small-scale explanation, the second on a large-scale explanation [Option ID = 5401]

Correct Answer :-

- The first depends on factors operating at the present time, the second on an evolutionary explanation [Option ID = 5399]

23) Which type of life history strategy is the most advantageous; semelparity or iteroparity and why?

[Question ID = 1352]

1. Iteroparity because the total number of offspring produced over the individual's life will be greater. [Option ID = 5402]
2. Neither; they are equivalent because they represent the trade-off between age and fecundity. [Option ID = 5403]
3. Semelparity because reproduction is assured. [Option ID = 5404]
4. Semelparity because the total number of offspring produced over the individual's life will be greater. [Option ID = 5405]

Correct Answer :-

- Neither; they are equivalent because they represent the trade-off between age and fecundity. [Option ID = 5403]

24) Based on the results of a statistical test, an ecologist reports a highly significant relationship between altitude and the number of species of tree in terms of a *p*-value as:

[Question ID = 1353]

1. $p > 0.50$

   [Option ID = 5406]
2. $p < 0.25$

   [Option ID = 5407]
3. $p < 0.10$

   [Option ID = 5408]
4. $p < 0.01$

   [Option ID = 5409]

Correct Answer :-

- $p < 0.01$

  [Option ID = 5409]

25) According to the basic Lotka-Volterra model, what is the final outcome of predator-prey interaction?

[Question ID = 1354]

1. Both predator and prey will ultimately go extinct [Option ID = 5410]
2. Both predator and prey will increase their numbers in a chaotic manner [Option ID = 5411]
3. Predator and prey populations coexist, each population maintaining equilibrium population sizes that never oscillate [Option ID = 5412]
4. Predator and prey will cycle in response to one another's abundance [Option ID = 5413]

Correct Answer :-

- Predator and prey will cycle in response to one another's abundance [Option ID = 5413]

26) Why does a lake often become inhospitable to aquatic animals after eutrophication?

[Question ID = 1355]

1. Eutrophication causes the explosive growth of algal and cyanobacterial populations. Decomposition of dead algae and cyanobacteria leads to depletion of oxygen

   [Option ID = 5414]
2. Eutrophication causes the explosive growth of algal and cyanobacterial populations reducing the penetration of light into the lake

   [Option ID = 5415]
3. Eutrophication causes the death of algae and cyanobacteria reducing the availability of food for fish within the lake, leading to their death

   [Option ID = 5416]
4. All of these

   [Option ID = 5417]

Correct Answer :-

- Eutrophication causes the explosive growth of algal and cyanobacterial populations. Decomposition of dead algae and cyanobacteria leads to depletion of oxygen

  [Option ID = 5414]

27) Which of the following characterises oligotrophic lakes?

[Question ID = 1356]

1. Animals that are tolerant of low-oxygen conditions [Option ID = 5418]
2. Few littoral plants, a low density of phytoplankton [Option ID = 5419]
3. Frequent algal blooms [Option ID = 5420]

4. [illegible]nal oxygen depletion [Option ID = 5421]

Answer :-

- Few littoral plants, a low density of phytoplankton [Option ID = 5419]

28) Which of the following pairs of biomes are characterized by relatively simple food webs?

[Question ID = 1357]

1. Desert and Grassland

   [Option ID = 5422]
2. Tundra and Desert

   [Option ID = 5423]
3. Tundra and Grassland

   [Option ID = 5424]
4. None of these

   [Option ID = 5425]

Correct Answer :-

- Tundra and Desert

  [Option ID = 5423]

29) Different species that belong to the same biome, but occur in widely separated geographic regions, often appear similar due to which of the following?

[Question ID = 1358]

1. Chance [Option ID = 5426]
2. Close evolutionary relationships [Option ID = 5427]
3. Convergent evolution [Option ID = 5428]
4. Recent common ancestry [Option ID = 5429]

Correct Answer :-

- Convergent evolution [Option ID = 5428]

30) Which of the following is the correct order of geologic eras, from most ancient to most recent?

[Question ID = 1359]

1. Paleozoic, Cenozoic, Mesozoic, Precambrian [Option ID = 5430]
2. Paleozoic, Mesozoic, Cenozoic, Precambrian [Option ID = 5431]
3. Precambrian, Paleozoic, Mesozoic, Cenozoic [Option ID = 5432]
4. Precambrian, Mesozoic, Cenozoic, Paleozoic [Option ID = 5433]

Correct Answer :-

- Precambrian, Paleozoic, Mesozoic, Cenozoic [Option ID = 5432]

31) A phylogenetic tree of insect families constructed by cladistic analysis would show which of the following?

[Question ID = 1360]

1. characteristics shared by all insect species

   [Option ID = 5434]
2. evolutionary relationships among families

   [Option ID = 5435]
3. analogous structures shared by species

   [Option ID = 5436]
4. all of these

   [Option ID = 5437]

Correct Answer :-

- evolutionary relationships among families

  [Option ID = 5435]

32) On 15th October 2016, countries adopted an amendment to phase down HFCs under the Montreal Protocol in which of the following countries?

[Question ID = 1361]

1. Algeria [Option ID = 5438]
2. Morocco [Option ID = 5439]
3. Rwanda [Option ID = 5440]
4. South Africa [Option ID = 5441]

Correct Answer :-

- Rwanda [Option ID = 5440]

Light absorption by Chlorophyll pigments *a* and *b* are highest for which of the following bands?

[Question ID = 1362]

1. Blue and Red

   [Option ID = 5442]
2. Blue and Green

   [Option ID = 5443]
3. Red and Green

   [Option ID = 5444]
4. Middle IR

   [Option ID = 5445]

Correct Answer :-

- Blue and Red

  [Option ID = 5442]

34) Stratospheric ozone absorbs UV radiation principally in which of the following wavelength ranges?

[Question ID = 1363]

1. 320-380 nm [Option ID = 5446]
2. 290-320 nm [Option ID = 5447]
3. 250-290 nm [Option ID = 5448]
4. Visible/Near IR [Option ID = 5449]

Correct Answer :-

- 290-320 nm [Option ID = 5447]

35) Which of the following protozoans is related to water borne diseases?

[Question ID = 1364]

1. *Paramecium sp.*

   [Option ID = 5450]
2. *Plasmodium vivax*

   [Option ID = 5451]
3. *Entamoeba histolytica*

   [Option ID = 5452]
4. All of these

   [Option ID = 5453]

Correct Answer :-

- *Entamoeba histolytica*

  [Option ID = 5452]

36) An international treaty on the control of transboundary movements of hazardous wastes and their disposal, usually known as the Basel Convention, does not include which of the following?

[Question ID = 1365]

1. Minimize the amount and toxicity of wastes generated [Option ID = 5454]
2. Movement of radioactive waste [Option ID = 5455]
3. Prevent transfer of hazardous waste from developed to less developed countries [Option ID = 5456]
4. Reduce the movements of hazardous waste between nations [Option ID = 5457]

Correct Answer :-

- Movement of radioactive waste [Option ID = 5455]

37) Which of the following is an *in-situ* biodiversity conservation site?

[Question ID = 1366]

1. Arboretum

   [Option ID = 5458]
2. Biosphere reserve

   [Option ID = 5459]
3. Botanical garden

   [Option ID = 5460]
4. Orchidarium

   [Option ID = 5461]

Correct Answer :-

- Biosphere reserve

on ID = 5458]

38) As per USDA soil taxonomy, the soil order that comprises temperate grassland soils with a dark humus-rich surface layer containing high concentrations of calcium and magnesium is called:

[Question ID = 1367]

1. Alfisol [Option ID = 5462]
2. Entisol [Option ID = 5463]
3. Mollisol [Option ID = 5464]
4. Spodosol [Option ID = 5465]

Correct Answer :-

- Mollisol [Option ID = 5464]

39) What is the direction of Ekman transport in the Northern hemisphere?

[Question ID = 1368]

1. 45° angle to the wind [Option ID = 5466]
2. 90° clockwise from wind direction [Option ID = 5467]
3. 90° counter clockwise from wind direction [Option ID = 5468]
4. Parallel to the surface wind [Option ID = 5469]

Correct Answer :-

- 90° clockwise from wind direction [Option ID = 5467]

40) Bleaching of corals is primarily due to which of the following?

[Question ID = 1369]

1. Loss of epithelial membrane [Option ID = 5470]
2. Loss of polyps [Option ID = 5471]
3. Loss of symbiotic alga [Option ID = 5472]
4. Rapid calcification [Option ID = 5473]

Correct Answer :-

- Loss of symbiotic alga [Option ID = 5472]

41) The oldest rock reported from India dates back to approximately which of the following?

[Question ID = 1370]

1. 800 Ma [Option ID = 5474]
2. 2500 Ma [Option ID = 5475]
3. 3500 Ma [Option ID = 5476]
4. 4500 Ma [Option ID = 5477]

Correct Answer :-

- 3500 Ma [Option ID = 5476]

42) Albedo will significantly increase due to which of the following changes in land use and land cover?

[Question ID = 1371]

1. Temperate forest to Grassland [Option ID = 5478]
2. Temperate forest to Tropical forest [Option ID = 5479]
3. Tropical forest to Savannah [Option ID = 5480]
4. Savannah to Desert [Option ID = 5481]

Correct Answer :-

- Savannah to Desert [Option ID = 5481]

43) Which of the following is *not* linked to ozone destruction in the stratosphere?

[Question ID = 1372]

1. CFC

   [Option ID = 5482]
2. Chlorine nitrate

   [Option ID = 5483]
3. Hydrocarbons

   [Option ID = 5484]
4. Hydrogen chloride

   [Option ID = 5485]

Correct Answer :-

- Hydrocarbons

  [Option ID = 5484]

44) What happened to the average salinity of the oceans during the glacial periods?

[Question ID = 1373]

1. ased [Option ID = 5486]
2. eased [Option ID = 5487]
3. ained unchanged [Option ID = 5488]
4. Was highest in the North Atlantic Ocean [Option ID = 5489]

Correct Answer :-

- Increased [Option ID = 5486]

45) The temperature attained by the atmosphere through isobaric cooling to saturation is known as:

[Question ID = 1374]

1. dew point temperature

   [Option ID = 5490]
2. equivalent temperature

   [Option ID = 5491]
3. wet-bulb temperature

   [Option ID = 5492]
4. All of these

   [Option ID = 5493]

Correct Answer :-

- dew point temperature

  [Option ID = 5490]

46) What happens to volume and temperature when a parcel of air moves upward?

[Question ID = 1375]

1. Its volume and temperature increases [Option ID = 5494]
2. Its volume and temperature decreases [Option ID = 5495]
3. Its volume decreases and temperature increases [Option ID = 5496]
4. Its volume increases and temperature decreases [Option ID = 5497]

Correct Answer :-

- Its volume increases and temperature decreases [Option ID = 5497]

47) The best sampling strategy for populations embracing a number of different habitat categories is:

[Question ID = 1376]

1. accidental sampling [Option ID = 5498]
2. clustered sampling [Option ID = 5499]
3. line-intercept sampling [Option ID = 5500]
4. stratified sampling [Option ID = 5501]

Correct Answer :-

- stratified sampling [Option ID = 5501]

48) During the course of ecological sampling, the accumulation of new species with increasing sampling effort can be visualized with:

[Question ID = 1377]

1. Simpson's index

   [Option ID = 5502]
2. species accumulation curve

   [Option ID = 5503]
3. Shannon-Wiener index

   [Option ID = 5504]
4. None of these

   [Option ID = 5505]

Correct Answer :-

- species accumulation curve

  [Option ID = 5503]

49) Who were awarded the Nobel Prize in Physiology or Medicine 2019 "for their discoveries of how cells sense and adapt to oxygen availability"?

[Question ID = 1378]

1. Abhijit Banerjee, Esther Duflo and Michael Kremer [Option ID = 5506]
2. John B. Goodenough, M. Stanley Whittingham and Akira Yoshino [Option ID = 5507]
3. Michel Mayor and Didier Queloz [Option ID = 5508]
4. William G. Kaelin Jr, Sir Peter J. Ratcliffe and Gregg L. Semenza [Option ID = 5509]

Correct Answer :-

am G. Kaelin Jr., Sir Peter J. Ratcliffe and Gregg L. Semenza [Option ID = 5509]

50) Shannon-Weiner diversity index is calculated using the equation?

[Question ID = 1379]

1. $S = \sum_{i=2}^{s} P_u^2$

   [Option ID = 5510]

2. $H = Pi \times \ln(Pi)$

   [Option ID = 5511]

3. $S = \sum P(n)$

   [Option ID = 5512]

4. $S = \frac{P}{n} \sum i$

   [Option ID = 5513]

Correct Answer :-

- $H = Pi \times \ln(Pi)$

  [Option ID = 5511]