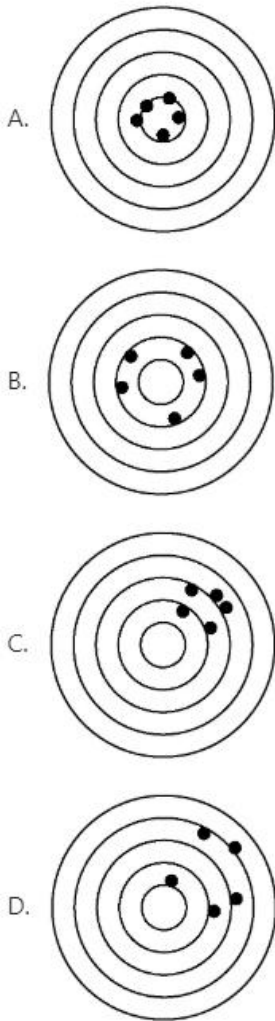If the black circles (dots) shown in the below figure represents experimental results and the centres of the bull's eyes represents the true value. Which one represents accurate and precise results ?

A.

B.

C.

D.

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

(A) ○ **A only (Correct Answer)**
(B) ○ B only
(C) ○ D only
(D) ○ C only

**Question No.2 (Question Id - 64)**
Coastline migration to inland and seaward due to rise and fall of sea level is known as :

(A) ○ Advances and retreat processes
(B) ○ **Transgression and regression processes (Correct Answer)**
(C) ○ Erosion and Accretion processes
(D) ○ All the above

**Question No.3 (Question Id - 27)**
Web of Science releases the list of journal impact factor every :

(A) ○ **One year (Correct Answer)**
(B) ○ Two years
(C) ○ Three years
(D) ○ Five years

(A) ○ A - IV, B - III, C - II, D - I (Correct Answer)
(B) ○ A - I, B - III, C - IV, D - II
(C) ○ A - III, B - II, C - I, D - IV
(D) ○ A - II, B - I, C - III, D - IV

---

**Question No.5 (Question Id - 84)**
Which of the following statements about the Coriolis force is **correct** ?

(A) ○ Coriolis force acts to its left in the northern hemisphere.
(B) ○ **Coriolis force acts to its left in the southern hemisphere. (Correct Answer)**
(C) ○ Coriolis force is maximum at the equator.
(D) ○ Coriolis force is zero at the poles.

---

**Question No.6 (Question Id - 47)**
The need to review the exiting literature is :

(A) ○ To make a long list of references
(B) ○ To cite references as much as possible
(C) ○ **To find out what is known in area of research (Correct Answer)**
(D) ○ To develop a chapter in thesis

---

**Question No.7 (Question Id - 62)**
Volcanoes that were active in the past but have shut off entirely and will never erupt in future are called
as :

(A) ○ Active volcanoes
(B) ○ Dormant volcanoes
(C) ○ **Extinct volcanoes (Correct Answer)**
(D) ○ All the above

---

**Question No.8 (Question Id - 40)**
Mathematical expression of standardized anomaly of a time series $x_1$, $x_2$, $x_3$, ……, $x_i$ having standard
deviation 's' is :

(A) ○ $\dfrac{(\bar{x} - x_i)}{s}$

(B) ○ $(\bar{x} - x_i)s$

(C) ○ $\boxed{\dfrac{(x_i - \bar{x})}{s}}$ **(Correct Answer)**

(D) ○ $(x_i - \bar{x})^s$

---

**Question No.9 (Question Id - 1)**
Ingamell's sampling for calcium analysis in soil samples is 0.50 gm. What weight should be taken to
obtain sampling precision of 0.2% RSD in the analysis ?

(A) ○ 0.25
(B) ○ **12.5 (Correct Answer)**
(C) ○ 1.00
(D) ○ 2.00

---

**Question No.10 (Question Id - 23)**
Which of the following software is NOT used for checking plagiarism ?

(A) ○ Copyleaks
○

| Pacific North America Index | II. Pressure difference between the Azores High and Icelandic Low. |
| C. El-Nino | III. Relation among the sea level pressure over the NE Pacific, the Gulf of Alaska, over the US-Canadian border and in the Florida Panhandle in the US. |
| D. Indian Ocean Dipole | IV. Sea level pressure difference between Darwin and Tahiti. |

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

(A) ◯  A - I, B - II, C - III, D - IV
(B) ◯  A - IV, B - III, C - I, D - II
(C) ◯  **A - II, B - III, C - IV, D - I (Correct Answer)**
(D) ◯  A - III, B - IV, C - II, D - I

---

**Question No.12 (Question Id - 12)**
A discrete sample is collected at a specific location in a particular time is called as :

(A) ◯  Composite sample
(B) ◯  Random sample
(C) ◯  Statigraphic sample
(D) ◯  **Grab sample (Correct Answer)**

---

**Question No.13 (Question Id - 89)**
Which of the mineral alteration takes place due to hydrolysis process ?

A.  Pyrite to Hematite

B.  Calcite to Bicarbonate and Calcium

C.  Feldspar to Clay

D.  Pyroxene to Iron Oxide

Choose the **correct** answer.

(A) ◯  A only
(B) ◯  **C only (Correct Answer)**
(C) ◯  B and C only
(D) ◯  C and D only

---

**Question No.14 (Question Id - 3)**
Which of the following number contains more than three significant figures ?

(A) ◯  0.216
(B) ◯  90.7
(C) ◯  **800.0 (Correct Answer)**
(D) ◯  0.0670

---

**Question No.15 (Question Id - 29)**
**Assertion A :**

In theoretical sampling, sample size is not defined in advance.

**Reason R :**

In theoretical sampling, extension of the basic population is not known in advance.

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

(A) ◯  **Both A and R are correct and R is the correct explanation of A (Correct Answer)**
(B) ◯  Both **A** and **R** are correct, but **R** is NOT the correct explanation of **A**

(A) ○ Halogenation

(B) ○ **Friedel-Crafts alkylation (Correct Answer)**

(C) ○ Friedel-Crafts acylation

(D) ○ Sulfonation

---

**Question No.17 (Question Id - 22)**

Ethics committee involves a group of experienced people :

(A) ○ Who understand the research problem.

(B) ○ **Who understand the degree of ethical issues considered in research problem. (Correct Answer)**

(C) ○ Who are useful in drawing line of action in research problem.

(D) ○ Who think about and hypothesis research problem.

---

**Question No.18 (Question Id - 67)**

Large crystals within a fine grained rock give an evidence of :

(A) ○ Relatively slow cooling

(B) ○ **Different rate of cooling (Correct Answer)**

(C) ○ Relatively rapid cooling

(D) ○ Relatively slow warming

---

**Question No.19 (Question Id - 31)**

Likert scale measures :

(A) ○ **a set of attitudes (Correct Answer)**

(B) ○ a set of statements

(C) ○ a set of indicators

(D) ○ a set of variable

---

**Question No.20 (Question Id - 18)**

The triple point temperature at which ice, liquid water and water vapor coexist at equilibrium, is approximately :

(A) ○ 293.16 K

(B) ○ 283.16 K

(C) ○ **273.16 K (Correct Answer)**

(D) ○ 263.16 K

---

**Question No.21 (Question Id - 13)**

Bed sediment sample in a stream and river at particular site should NOT be collected from :

(A) ○ **Downstream location (Correct Answer)**

(B) ○ Locations free of debris obstacle

(C) ○ Upstream location

(D) ○ No mixing zone

---

**Question No.22 (Question Id - 96)**

Which of the following irrigation systems produces the most biomass per unit of water applied ?

(A) ○ Flood irrigation

(B) ○ Furrow irrigation

(C) ○ **Drip irrigation (Correct Answer)**

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

(A) ◯ A - III, B - I, C - IV, D - II
(B) ◯ A - II, B - IV, C - I, D - III
(C) ◯ A - IV, B - III, C - I, D - II
(D) ◯ **A - III, B - IV, C - I, D - II (Correct Answer)**

---

**Question No.24 (Question Id - 45)**
**Statement I :**

Central limit theorem states that in the limit the sum of a set independent observation will have Gaussian distribution.

**Statement II :**

The observations need not even be from the same distribution.

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

(A) ◯ **Both Statement I and Statement II are correct (Correct Answer)**
(B) ◯ Both **Statement I** and **Statement II** are incorrect
(C) ◯ **Statement I** is correct, but **Statement II** is incorrect
(D) ◯ **Statement I** is incorrect, but **Statement II** is correct

---

**Question No.25 (Question Id - 99)**
The first Conference of Parties (COP) meeting in March 1995 was held in :

(A) ◯ Madrid, Spain
(B) ◯ **Berlin, Germany (Correct Answer)**
(C) ◯ Warsaw, Poland
(D) ◯ Kyota, Japan

---

**Question No.26 (Question Id - 19)**
Super-cooled (unfrozen) liquid water can exist between temperature of :

(A) ◯ + 40°C to - 40°C
(B) ◯ **0°C to - 40°C (Correct Answer)**
(C) ◯ + 40°C to 0°C
(D) ◯ 0°C

---

**Question No.27 (Question Id - 79)**
**Statement I :**

Deterministic forecast gives a prediction of what will happen at a particular time and place.

**Statement II :**

Probabilistic forecast gives an indication of a probability of particular event within a particular time frame or geographic location.

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

(A) ◯ **Both Statement I and Statement II are correct (Correct Answer)**
(B) ◯ Both **Statement I** and **Statement II** are incorrect
(C) ◯ **Statement I** is correct but **Statement II** is incorrect
(D) ◯ **Statement I** is incorrect but **Statement II** is correct

---

**Question No.28 (Question Id - 24)**

) ○ $CaCl_2$ (anhydrous)

(B) ○ $MgClO_4$ (anhydrous)

(C) ○ $P_2O_5$

(D) ○ **Silica gel (Correct Answer)**

---

### Question No.30 (Question Id - 59)

Which of the following compounds can exhibit *cis/trans* isomerism ?

(A) ○ 1-heptene

(B) ○ **2-heptene (Correct Answer)**

(C) ○ 2-methyl-2-hexene

(D) ○ 3-ethyl-2-pentene

---

### Question No.31 (Question Id - 33)

The square of sample standard deviation ($s^2$) is known as :

(A) ○ Sample mean

(B) ○ Sample square

(C) ○ Sample deviation

(D) ○ **Sample variance (Correct Answer)**

---

### Question No.32 (Question Id - 55)

Which of the following molecules have Trigonal Planer shape ?

A. $BF_3$

B. $SO_3$

C. $CO_3^{2-}$

D. $NO_2^-$

Choose the **correct** option.

(A) ○ A and B only

(B) ○ **A, B and C only (Correct Answer)**

(C) ○ C and D only

(D) ○ A, B, C and D

---

### Question No.33 (Question Id - 63)

Medium to course grained rock formed at high temperature and has schistosity with long preferred orientation of mica minerals is known as :

(A) ○ Gneiss

(B) ○ Phyllite

(C) ○ **Schist (Correct Answer)**

(D) ○ Slate

---

### Question No.34 (Question Id - 4)

The pH of a $2.0 \times 10^{-3}$ M solution of HCl is :

(A) ○ **2.70 (Correct Answer)**

(B) ○ 3.30

(C) ○ 1.70

(D) ○ 3.70

**Question No.36 (Question Id - 82)**

e rate of heat penetration in a material is dependent on its :

(A) ◯  Kinematic viscosity

(B) ◯  **Thermal diffusivity (Correct Answer)**

(C) ◯  Specific density

(D) ◯  Dynamic viscosity

---

**Question No.37 (Question Id - 42)**

Confidence interval around sample statistics is represented using :

(A) ◯  **Error bar (Correct Answer)**

(B) ◯  Range plot distribution

(C) ◯  Type 1 error

(D) ◯  Type 2 error

---

**Question No.38 (Question Id - 48)**

Which of the following correctly explains plagiarism ?

(A) ◯  Make use of work of others to gather information

(B) ◯  **Make use of work of others and misrepresent it as your own (Correct Answer)**

(C) ◯  Make use of work of others to support your own argument

(D) ◯  Make use of work of others to help shape you research objectives

---

**Question No.39 (Question Id - 6)**

**Statement I :**

Silica in a soil sample digested following combination of acids (HF, $HNO_3$, $HClO_4$) cannot be determined using ICP-OES.

**Statement II :**

ICP-OES instrument is not capable of detecting silica.

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

(A) ◯  Both **Statement I** and **Statement II** are correct

(B) ◯  **Both Statement I and Statement II are incorrect (Correct Answer)**

(C) ◯  **Statement I** is correct, but **Statement II** is incorrect

(D) ◯  **Statement I** is incorrect, but **Statement II** is correct

---

**Question No.40 (Question Id - 53)**

Internal energy (U) of a system is :

A.  A state property

B.  Extensive property

C.  Intensive property

D.  Independent of state

Choose the **correct** option.

(A) ◯  **A and B only (Correct Answer)**

(B) ◯  A and C only

(C) ◯  D and B only

(D) ◯  D and C only

---

**Question No.41 (Question Id - 97)**

Landscape evolution can be best described :

(A) ○ Methane
) ○ Nitrous Oxide
) ○ $H_2O$ vapor
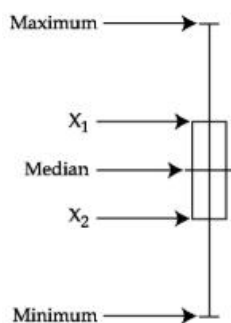(D) ○ **Nitrogen dioxide (Correct Answer)**

---

**Question No.43 (Question Id - 68)**

Oceanic crust made up of basalt has the density of :

(A) ○ 2.70 g/cm$^3$

(B) ○ 3.35 g/cm$^3$

(C) ○ **3.05 g/cm$^3$ (Correct Answer)**

(D) ○ 2.95 g/cm$^3$

---

**Question No.44 (Question Id - 32)**

In the following Box and Whisker plot, $X_1$ and $X_2$ correspond to :



(A) ○ **$X_1$ = upper quartile; $X_2$ = lower quartile (Correct Answer)**

(B) ○ $X_1$ = lower quartile; $X_2$ = upper quartile

(C) ○ $X_1$ = upper median; $X_2$ = lower median

(D) ○ $X_1$ = lower median; $X_2$ = upper median

---

**Question No.45 (Question Id - 49)**

Which of the following best explains the ''informed consent'' while conducting surveys ?

(A) ○ Telling participants about yourself and your study

(B) ○ Telling participants that research ethics committee has approved your work

(C) ○ **Telling participants about the research interest and their involvement (Correct Answer)**

(D) ○ Telling participants about findings of research at the end of the research

---

**Question No.46 (Question Id - 17)**

**Statement I :**

Parametric tests are those conducted in situations where one knows or assumes that a particular theoretical distribution is an appropriate representation for the data and/or test statistics.

**Statement II :**

Non-parametric or distribution-free tests are constructed without the necessity of assumptions about what, if any, theoretical distribution pertain to the data at hand.

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

(A) ○ **Both Statement I and Statement II are correct (Correct Answer)**

(B) ○ Both **Statement I** and **Statement II** are incorrect

(C) ○ **Statement I** is correct but **Statement II** is incorrect

(D) ○ **Statement I** is incorrect but **Statement II** is correct

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**Question No.47 (Question Id - 9)**

(A) ⬭ A, C, D only
(B) ⬭ A, B, D only
(C) ⬭ B, C, D only
(D) ⬭ **A, B, C and D (Correct Answer)**

---

**Question No.48 (Question Id - 100)**
Which earth process would be increased if there were a slight increase in solar energy received by the earth ?

A. Erosion

B. Infiltration

C. Evapotranspiration

D. Mountain building

Choose the **correct** answer given below :

(A) ⬭ **C only (Correct Answer)**
(B) ⬭ A and C only
(C) ⬭ A, B, C, D
(D) ⬭ A only

---

**Question No.49 (Question Id - 50)**
Which of the following is true regarding Beer's Law ?

(A) ⬭ **Absorbance is proportional to both path length and concentration of absorbing species (Correct Answer)**
(B) ⬭ Absorbance is proportional to the log of the concentration of absorbing species
(C) ⬭ Absorbance is proportional to atmospheric pressure
(D) ⬭ Absorbance is proportional to volume of absorbing species

---

**Question No.50 (Question Id - 15)**

The given below has a list of quality control parameters and the primary means of general quality control procedures. Based on this, match the following :

| A. Accuracy | I. Analysis of Blanks |
|---|---|
| B. Precision | II. Analysis of matrix spikes |
| C. Cross contamination | III. Analysis of replicate samples |
| D. Extraction efficiency | IV. Analysis of reference materials or samples of known concentration |

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

(A) ⬭ A - I, B - III, C - II, D - IV
(B) ⬭ **A - I, B - II, C - III, D - IV (Correct Answer)**
(C) ⬭ A - II, B - III, C - I, D - IV
(D) ⬭ A - IV, B - III, C - II, D - I

---

**Question No.51 (Question Id - 54)**
Van der Waals equation is correctly represented as :

(A) ⬭ $\left(p + \dfrac{an^2}{V^2}\right)\left(V^2 - nb\right) = nRT$ **(Correct Answer)**

(B) ⬭ $\left(p + \dfrac{a}{V^2}\right)\left(V - nb\right) = nRT$

(C) ⬭ $\left(p + \dfrac{a}{V^2}\right)\left(V - b\right) = nRT$

(A) ○ A, B, C, D
(B) ○ B, C, A, D
(C) ○ **C, B, A, D (Correct Answer)**
(D) ○ C, A, D, B

**Question No.53 (Question Id - 98)**
Which of the following biogeochemical cycle do not involve gas phase ?

(A) ○ Nitrogen
(B) ○ Carbon
(C) ○ **Phosphorus (Correct Answer)**
(D) ○ Sulfur

**Question No.54 (Question Id - 37)**

Match the following measured (**List-I** with **List-II**) used in hypothesis.

| List - I | List - II |
|---|---|
| A. Test statistic | I. It constitutes a specific logical frame of reference |
| B. Null hypothesis | II. It is generalised hypothesis which mainly states that null hypothesis is not true |
| C. Alternative hypothesis | III. It is simply the sampling distribution of the test statistic |
| D. Null distribution | IV. That is appropriate to the data and question in hand |

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

(A) ○ A - I, B - II, C - III, D - IV
(B) ○ A - II, B - I, C - III, D - IV
(C) ○ A - III, B - II, C - I, D - IV
(D) ○ **A - IV, B - I, C - II, D - III (Correct Answer)**

**Question No.55 (Question Id - 69)**
Haemoglobin in human has the highest affinity to which of the following gas ?

(A) ○ $CH_4$
(B) ○ **CO (Correct Answer)**
(C) ○ $N_2O$
(D) ○ $CO_2$

**Question No.56 (Question Id - 35)**
The most commonly used measure of dispersion is :

(A) ○ Average
(B) ○ Interquartile range
(C) ○ **Standard deviation (Correct Answer)**
(D) ○ Mean deviation

**Question No.57 (Question Id - 41)**
Stationarity in data time series corresponds to :

(A) ○ same underlying mean but varying variance
(B) ○ varying underlying mean but same variance
(C) ○ **same underlying mean and variance (Correct Answer)**

**Question No.59 (Question Id - 73)**

$p_i$ is the proportion to total sample represented by species $i$, and H' is the maximum possible diversity then the Species diversity is represented by :

(A) ○ $H' = -p_i \sum_{i=0}^{n} p_i \log_{10} p_i$

(B) ○ $\boxed{H' = -\sum_{i=0}^{n} p_i \log_e p_i}$ **(Correct Answer)**

(C) ○ $H' = -p_i \sum_{i=0}^{n} p_i \log_e p_i$
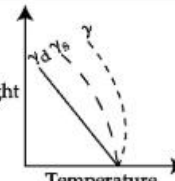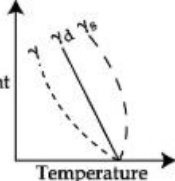
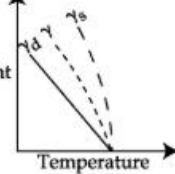(D) ○ $H' = -\sum_{i=0}^{n} p_i \log_{10} p_i$

**Question No.60 (Question Id - 94)**
Which is NOT a characteristic of a eutrophic lake ?

(A) ○ **High fish population (Correct Answer)**
(B) ○ High BOD
(C) ○ Low dissolved oxygen
(D) ○ High Benthic demand

**Question No.61 (Question Id - 80)**

Match the following figure with corresponding atmospheric stability conditions (where, $\gamma_s$ : saturated adiabatic lapse rate; $\gamma_d$ : dry adiabatic lapse rate; $\gamma$ : environmental lapse rate)



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

(A) ○ A - I, B - II, C - III
(B) ○ A - III, B - II, C - I
(C) ○ **A - III, B - I, C - II (Correct Answer)**
(D) ○ A - II, B - III, C - I

**Question No.62 (Question Id - 56)**
Which of the following have highest ligand field strength ?

(A) ○ $NH_3$
(B) ○ $Cl^-$
(C) ○ $NO_3^-$
(D) ○ **$CN^-$ (Correct Answer)**

(C) ◯ A - I, B - II, C - IV, D - III

(D) ◯ A - III, B - IV, C - I, D - II

---

**Question No.64 (Question Id - 85)**

The absorption of sound by a porous ground surface would be maximum among which of the following frequency ranges ?

(A) ◯ **500 Hz (Correct Answer)**

(B) ◯ 2000 Hz

(C) ◯ 10000 Hz

(D) ◯ 15000 Hz

---

**Question No.65 (Question Id - 90)**

A mass of fragmented rock will weather faster than a solid mass of the same weight and chemical composition because :

 A. Surface area is increased

 B. The volume of the material is increased

 C. Molecular structure is altered by crushing

 D. The inner structure of the material is exposed

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

(A) ◯ A, B and C only

(B) ◯ B and D only

(C) ◯ **A only (Correct Answer)**

(D) ◯ C only

---

**Question No.66 (Question Id - 30)**

Layout of any scientific manuscript does not include :

(A) ◯ Font

(B) ◯ Margin

(C) ◯ **Breaks (Correct Answer)**

(D) ◯ Lines

---

**Question No.67 (Question Id - 93)**

Which of the following is considered necessary features for an area to be delineated as a wetland ?

(A) ◯ **Hydric soil (Correct Answer)**

(B) ◯ Shallow standing water

(C) ◯ Aquatic vegetation

(D) ◯ Organic soil

---

**Question No.68 (Question Id - 76)**

Statement I :

The convex curve (Type I) indicates remarkably low mortality during most part of the organism life and heavy mortality when the members reach the age of senescence.

Statement II :

The concave curve (Type III) indicates excessively high mortality in early life.

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

III. Argon
IV. LPG

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

(A) ○ A - I, B - II, C - III, D - IV
(B) ○ **A - I, B - III, C - II, D - IV (Correct Answer)**
(C) ○ A - II, B - III, C - I, D - IV
(D) ○ A - IV, B - III, C - II, D - I

**Question No.70 (Question Id - 34)**

Mathematical expression of standard deviation, say "s", of a time series of a sample $x_1, x_2, x_3, ……, x_i$ is :

(A) ○ $s = \sqrt{\dfrac{1}{n+1}(x_i - \bar{x})^2}$

(B) ○ $s = \sqrt{\dfrac{1}{n-1}(\bar{x} - x_i)^2}$

(C) ○ $s = \sqrt{\dfrac{1}{n-1}(x_i - \bar{x})^2}$ **(Correct Answer)**

(D) ○ $s = \sqrt{\dfrac{1}{n+1}(\bar{x} - x_i)^2}$

**Question No.71 (Question Id - 77)**

Match the following for the cell cycle :

| A. M phase | I. DNA replicates as associated proteins synthesized; two copies of cell's genetic information now exist |
|---|---|
| B. $G_1$ phase | II. Two sets of chromosomes are separated and cell divides |
| C. $G_2$ phase | III. Cell doubles in size, organelles, enzymes and other molecules increase in number |
| D. S phase | IV. Structure required for cell division begin to assemble; chromosomes begin to condense |

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

(A) ○ **A - II, B - III, C - IV, D - I (Correct Answer)**
(B) ○ A - III, B - I, C - II, D - IV
(C) ○ A - IV, B - I, C - II, D - III
(D) ○ A - I, B - IV, C - II, D - III

**Question No.72 (Question Id - 70)**

Calcitriol is the biologically active form of which of the following vitamins :

(A) ○ B
(B) ○ C
(C) ○ **D (Correct Answer)**
(D) ○ E

**Question No.73 (Question Id - 52)**

**Assertion A :**

Temperature of 100 gm of water in a plastic beaker dropped from 18.2ºC to 12.8ºC after addition of 7.10 gm of $NH_4NO_3$.

**Reason R :**

Above reaction is endothermic in nature.

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

(A) ◯ Judgmental sampling **(Correct Answer)**
(B) ◯ Simple random sampling
(C) ◯ Systematic random sampling
(D) ◯ Search sampling

---

**Question No.75 (Question Id - 61)**
The water yielding capacity of an aquifer can be expressed in terms of its :

(A) ◯ Transmissivity
(B) ◯ Leaky aquifer
(C) ◯ **Storage coefficient (Correct Answer)**
(D) ◯ Hydraulic conductivity

---

**Question No.76 (Question Id - 14)**
Which of the following equipment is preferred for simultaneous analysis of metals in water samples ?

(A) ◯ Atomic Absorption Spectrometer
(B) ◯ Spectrophotometer
(C) ◯ **Inductively Couples Plasma - Optical Emission Spectrometer (Correct Answer)**
(D) ◯ Spectrofluorimeter

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**Question No.77 (Question Id - 81)**
The energy available for the sensible, latent and ground heat fluxes is not partitioned equally between them. However major partitioning of energy is in between sensible (H) and latent heat (LE) fluxes. The H/LE is represent :

(A) ◯ Emission ratio
(B) ◯ Buduyko ratio
(C) ◯ Partitioning ratio
(D) ◯ **Bowen ratio (Correct Answer)**

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**Question No.78 (Question Id - 25)**
Science Citation Index (SCI) was introduced by :

(A) ◯ Scopus
(B) ◯ Web of Science
(C) ◯ **Institute of Scientific Information (Correct Answer)**
(D) ◯ Clarivate

---

**Question No.79 (Question Id - 43)**
In 2-D  cumulative frequency distribution plot, vertical and horizontal axes respectively correspond to :

(A) ◯ data values in both axes
(B) ◯ **quantile probabilities and data values (Correct Answer)**
(C) ◯ data values and quantile probabilities
(D) ◯ quantile probabilities in both axes

---

**Question No.80 (Question Id - 46)**
In the histogram, the range of data is divided into :

(A) ◯ **Bins (Correct Answer)**
(B) ◯ Orders
(C) ◯ Series
(D) ◯ Widths

(D) ΔE = + CAT (Correct Answer)

**Question No.82 (Question Id - 28)**

i10-index of an author is available at :

(A) ○ Springer
(B) ○ Research Gate
(C) ○ Scopus
(D) ○ **Google Scholar Citation (Correct Answer)**

**Question No.83 (Question Id - 66)**

Match **List-I** with **List-II** :

| List - I | List - II |
| --- | --- |
| A. Contact metamorphism | I. Blue schist |
| B. Collisional mountain belt | II. Green schist |
| C. Stable continent | III. Amphibolite |
| D. Accretionary prism | IV. Hornfels |

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

(A) ○ A - I, B - III, C - II, D - IV
(B) ○ A - III, B - II, C - I, D - IV
(C) ○ A - II, B - IV, C - III, D - I
(D) ○ **A - IV, B - III, C - II, D - I (Correct Answer)**

**Question No.84 (Question Id - 36)**

**Statement I :**

Sample skewness coefficient, a measure of symmetry in a batch of data is neither robust not resistant.

**Statement II :**

A robust and resistant alternative to the sample skewness is the Yule-Kendall index.

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

(A) ○ **Both Statement I and Statement II are correct (Correct Answer)**
(B) ○ **Statement I** is correct, but **Statement II** is incorrect
(C) ○ **Statement I** is incorrect, but **Statement II** is correct
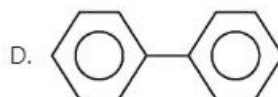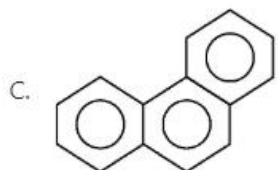(D) ○ Both **Statement I** and **II** are incorrect

**Question No.85 (Question Id - 38)**

If p represents the probability of success and N represents the number of trails, then the probability (P) that a random variable X takes a specific value x, is :

(A) ○ $P\{X=x\} = \binom{N}{x} p^x (1-p)^{N-x}$ **(Correct Answer)**

(B) ○ $P\{X = x\} = (N)p^x (1 - p)^{N-x}$

(C) ○ $P\{X = x\} = (x) p^x (1 - p)N - x$

(D) ○ $P\{X=x\} = \binom{x}{N} p^N (1-p)^{N-x}$

**Question No.86 (Question Id - 26)**

Which of the following is a specific database of Medical or health-related research areas ?

B. 

C. 

D. 

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

(A) ○ **A (Correct Answer)**
(B) ○ B
(C) ○ C
(D) ○ D

---

**Question No.88 (Question Id - 65)**

The mats of cyanobacteria occurs in rocks as fossil forms of bacteria and archea during the geological period corresponding to approximately :

(A) ○ 5.8 million years ago
(B) ○ **3.2 million years ago (Correct Answer)**
(C) ○ 4.5 million years ago
(D) ○ 5.2 million years ago

---

**Question No.89 (Question Id - 95)**

Which of the following is NOT formed during the decay of $^{238}U$ ?

(A) ○ $^{234}Th$
(B) ○ $^{234}U$
(C) ○ **$^{208}Pb$ (Correct Answer)**
(D) ○ $^{206}Pb$

---

**Question No.90 (Question Id - 44)**

In simple liner regression equation, the true value of predictant is the sum of :

(A) ○ Constants
(B) ○ **Predicted values (Correct Answer)**
(C) ○ Regression coefficient
(D) ○ Dependent variable

---

**Question No.91 (Question Id - 58)**

An IR spectrum of an unknown organic molecule having the formula $C_3H_6O$ gives a strong absorption at 1725 cm$^{-1}$. To what class of compounds does the unknown belong ?

(A) ○ Acid chloride
(B) ○ Alkene
(C) ○ **Ketone (Correct Answer)**
(D) ○ Phenol

pine forest the C:N ratio in tree trunk is much higher than that of either branches or needles.

**Statement II :**

In pine forest, living needles have C:N ratio similar to those understory herbs living on forest floor.

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

(A) ○ **Both Statement I and Statement II are correct (Correct Answer)**

(B) ○ Both **Statement I** and **Statement II** are incorrect

(C) ○ **Statement I** is correct but **Statement II** is incorrect

(D) ○ **Statement I** is incorrect but **Statement II** is correct

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**Question No.94 (Question Id - 39)**

Pearson correlation coefficient of the two variables $x_i$ and $y_i$ is expressed as :

(A) ○ $$\frac{\frac{1}{(n-1)}\sum_{i=1}^{n}[(x_i-\bar{x})(x_i-\bar{x})]}{\left\{\sum_{i=1}^{n}(x_i-\bar{x})^2\right\}\left\{\sum_{i=1}^{n}(y_i-\bar{y})^2\right\}}$$

(B) ○ $$\frac{\frac{1}{(n-1)}\sum_{i=1}^{n}[(x_i-\bar{x})(y_i-\bar{y})]}{\left\{\frac{1}{(n-1)}\sum_{i=1}^{n}(x_i-\bar{x})^2\right\}^{\frac{1}{2}}\left\{\frac{1}{(n-1)}\sum_{i=1}^{n}(y_i-\bar{y})^2\right\}^{\frac{1}{2}}}$$ **(Correct Answer)**

(C) ○ $$\frac{\sum_{i=1}^{n}[(x_i-\bar{x})(y_i-\bar{y})]}{\{(x_i-\bar{x})\}^2\{(y_i-\bar{y})\}^2}$$

(D) ○ $$\frac{(n-1)\sum_{i=1}^{n}[(x_i-\bar{x})(y_i-\bar{y})]}{\left\{\frac{1}{(n-1)}\sum_{i=1}^{n}(x_i-\bar{x})^2\right\}^{\frac{1}{2}}\left\{\frac{1}{(n-1)}\sum_{i=1}^{n}(y_i-\bar{y})^2\right\}^{\frac{1}{2}}}$$

---

**Question No.95 (Question Id - 86)**

Most of the terrestrial radiation is absorbed in the infrared portion of the electromagnetic radiation. The major exception in the region between 8 and 14 µm is called :

(A) ○ Terrestrial windows

(B) ○ Radiation windows

(C) ○ **Atmospheric windows (Correct Answer)**

(D) ○ Earth windows

---

**Question No.96 (Question Id - 74)**

The term 'keystone species' was given by :

(A) ○ **Robert Paine (Correct Answer)**

(B) ○ Kirk Winemiller

(C) ○ Joseph Connell

(D) ○ David Tilman

---

**Question No.97 (Question Id - 10)**

Benzene measurements in the ground water samples are given below :

| Measurement | Benzene concentration (µg/L) |
|---|---|
| 1 | 3.35 |
| 2 | 2.25 |
| 3 | 2.09 |
| 4 | 2.01 |
| 5 | 2.15 |

What will be the mean concentration (µg/L) ?

○

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

(A) ○  C, D, B, A
(B) ○  **C, A, B, D (Correct Answer)**
(C) ○  A, B, C, D
(D) ○  C, B, A, D

---

**Question No.99 (Question Id - 21)**

University Grants Commission (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Education Institutes Regulation, 2018) recommends the following penalties in case of plagiarism in submission of thesis and dissertations.

| A. Level 0 : Similarities upto 10% | I. Shall be asked to submit a revised script within a stipulated time period not exceeding 6 months. |
|---|---|
| B. Level 1 : Similarities above 10% to 40% | II. Minor similarities, no penalty. |
| C. Level 2 : Similarities above 40% to 60% | III. Student shall be debarred from submitting a revised script for a period of one year. |
| D. Level 3 : Similarities above 60% | IV. Student registration for that program shall be cancelled. |

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

(A) ○  **A - II, B - I, C - III, D - IV (Correct Answer)**
(B) ○  A - III, B - I, C - II, D - IV
(C) ○  A - III, B - II, C - I, D - IV
(D) ○  A - IV, B - III, C - II, D - I

---

**Question No.100 (Question Id - 11)**
Which of the following statements are true for both gas chromatography and high pressure liquid chromatography ?

A. The analyte is partitioned between a stationary phase and a gaseous phase.

B. The partitioning process occurs between stationary and liquid phase.

C. Separation is based on the affinity of the analyte of interest with stationary phase.

D. Analyte having the highest affinity is retained in the column.

Choose the **correct** statement .

(A) ○  A & B only
(B) ○  C & B only
(C) ○  **C & D only (Correct Answer)**
(D) ○  B & C only

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