TCSiON CAE

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name :	PC22174WaterResourcesGAZ2217 19th July 2023 Shift 2
Subject Name :	PC22174 Water Resources GAZ2217
Actual Answer Key :	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No
Is this Group for Examiner? :	No
Examiner permission :	Cant View

Show Progress Bar? :	No

Water Resources

Section type :	Online
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Is Section Default? :	null

Question Number : 1 Question Id : 630680275935 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following supercontinents based on the age of formation (from the most recent to the oldest):

A) Pangea

B) Rodinia

C) Nuna

D) Pannotia

Options :

1. ✔ A, D, B, C

2. ✖ A, B, C, D

3. ✖ D, C, B, A

4. ✖ B, C, D, A

Question Number : 2 Question Id : 630680275936 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The mineral phase transformations from olivine to wadsleyite and from ringwoodite to perovskite occur in which of the following parts of the Earth?

Options :

1. ✖ D" layer

2. ✖ Low-velocity zone (LVZ)

3. ✔ Transition zone between upper and lower mantle

4. ✖ Inner core

Question Number : 3 Question Id : 630680275937 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following are surface waves?

Options :

1. ✔ L-waves

2. ✖ P-waves

3. ✖ S-waves

4. ✖ Both P and S-waves

Question Number : 4 Question Id : 630680275938 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Mauna Loa, the largest subaerial volcano on Earth, located in the Hawaiian islands is _____ in its shape.

Options :

1. ✔ shield volcano

2. ✖ cinder volcano

3. ✖ lava dome

4. ✖ stratovolcano

Question Number : 5 Question Id : 630680275939 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following chemical reactions is an example of hydrolysis, a type of chemical weathering?

Options :

1. ✖ The breakdown of limestone due to carbonation.

2. ✖ The dissolution of quartz in water.

3. ✖ The oxidation of iron in a rock, causing it to rust.

4. ✔ Alteration of potassium feldspar to clay minerals in the presence of water.

Question Number : 6 Question Id : 630680275940 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following mineral ores is classified as sulphides?

Options :

1. ✖ Chromite

2. ✔ Galena

3. ✖ Wolframite

4. ✖ Malachite

Question Number : 7 Question Id : 630680275941 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following options correctly identifies a pair of related statements regarding earthquakes?

A: The magnitude of an earthquake is a qualitative measure that describes the effects and level of shaking experienced at specific locations as a result of an earthquake.

B: The Modified Mercalli scale is commonly used to measure the magnitude of an earthquake.

Options :

1. ✖ Only A

2. ✖ Only B

3. ✖ Both A and B

4. ✔ Neither A nor B

Question Number : 8 Question Id : 630680275942 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct?

A: Fluorite exhibits four sets of cleavage.

B: Fluorite has a hardness of four on Mohs scale.

Options :

1. ✖ Only A

2. ✖ Only B

3. ✔ Both A and B

4. ✖ Neither A nor B

Question Number : 9 Question Id : 630680275943 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The texture of igneous rocks having most of the constituent mineral grains as euhedral is known as:

Options :

1. ✖ hypidiomorphic

2. ✔ panidiomorphic

3. ✖ allotriomorphic

4.

✖ vitrophyric

Question Number : 10 Question Id : 630680275944 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Magmatic differentiation processes such as 'crystal settling' and 'crystal floatation' are parts of the:

Options :

1. ✖ flowage segregation model

2. ✖ filter pressing model

3. ✔ gravitational segregation model

4. ✖ convective melt fractionation model

Question Number : 11 Question Id : 630680275945 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the plutonic rocks in Group I with corresponding volcanic equivalents in Group II:

Group I	Group II
P. Granite	L. Rhyolite
Q. Gabbro	M. Dacite
R. Diorite	N. Basalt
S. Granodiorite	O. Andesite

Options :

1. ✖ P-N, Q-M, R-L, S-O

2. ✖ P-O, Q-L, R-M, S-N

3. ✖ P-M, Q-O, R-N, S-L

4. ✔ P-L, Q-N, R-O, S-M

Question Number : 12 Question Id : 630680275946 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The major mineral constituents of Gabbro are:

Options :

1. ✖ Alkali feldspar + Quartz

2. ✔ Ca-Plagioclase + Pyroxene

3. ✖ Na-Plagioclase + Amphibole

4. ✖ Olivine + Pyroxene

Question Number : 13 Question Id : 630680275947 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the metamorphic textures in Group I with corresponding rock/process in Group II:

Group I	Group II
P. Porphyroclastic	L. Contact metamorphism
Q. Lepidoblastic	M. Mylonite
R. Hornfelsic	N. Marble
S. Granoblastic	O. Mica schist

Options :

1. ✖ P-N, Q-M, R-L, S-O

2. ✖ P-O, Q-L, R-M, S-N

3. ✔ P-M, Q-O, R-L, S-N

4. ✖ P-L, Q-N, R-O, S-M

Question Number : 14 Question Id : 630680275948 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Four different rock types are exposed in an area coded as W, X, Y, Z; where,

W = Garnet-biotite-muscovite schist

X = Biotite-gneiss

Y = Slate

Z = Chlorite-phyllite

Select the correct order of rocks in terms of increasing grade of metamorphism:

Options :

1. ✖ Y<Z<X<W

2. ✖ W<X<Y<Z

3. ✖ Z<W<Y<X

4. ✔ Y<Z<W<X

Question Number : 15 Question Id : 630680275949 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements about metamorphic zones and isograds is INCORRECT?

Options :

1. ✖ Kyanite isograd lies between staurolite and kyanite zones.

2. ✖ Garnet zone lies between garnet and staurolite isograds.

3. ✖ Sillimanite isograd lies between kyanite and sillimanite zones.

4. ✔ Staurolite zone lies between garnet and staurolite isograds.

Question Number : 16 Question Id : 630680275950 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The dip of any inclined plane is measured from the _____ surface and in the _____ plane.

Options :

1. ✔ horizontal, vertical

2. ✖ vertical, vertical

3. ✖ horizontal, horizontal

4. ✖ vertical, horizontal

Question Number : 17 Question Id : 630680275951 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following minerals in increasing order of stability for weathering according to the Goldich dissolution series:

Options :

1. ✔ Olivine, Pyroxene, Amphibole, K-Feldspar

2. ✖ K-Feldspar, Amphibole, Pyroxene, Olivine

3. ✖ Pyroxene, K-Feldspar, Olivine, Amphibole

4. ✖ Amphibole, Olivine, K-Feldspar, Pyroxene

Question Number : 18 Question Id : 630680275952 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Most of the rock-forming minerals are studied under _____ light microscopy, while most of the ore-forming minerals are studied under _____ light microscopy.

Options :

1. ✔ transmitted, reflected

2. ✖ reflected, transmitted

3. ✖ blue, red

4. ✖ low, high

Question Number : 19 Question Id : 630680275953 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following silicate structures in increasing order of complexity.

Options :

1. ✖ Chain silicates, Sheet silicates, Framework silicates, Nesosilicates

2. ✔ Nesosilicates, Chain silicates, Sheet silicates, Framework silicates

3. ✖ Nesosilicates, Sheet silicates, Chain silicates, Framework silicates

4. ✖ Framework silicates, Chain silicates, Nesosilicates, Sheet silicates

Question Number : 20 Question Id : 630680275954 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct regarding the Pyralspite and Ugrandite series of garnet?

Statement 1: Pyralspite series consists of Almandine as one of the garnet end-members

Statement 2: Ugrandite series consists of Spessartine as one of the garnet end-members.

Options :

1. ✔ Statement 1 is correct, and Statement 2 is incorrect.

2. ✖ Statement 1 is incorrect, and Statement 2 is correct.

3. ✖ Both Statement 1 and Statement 2 are correct.

4. ✖ Both Statement 1 and Statement 2 are incorrect.

Question Number : 21 Question Id : 630680275955 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Streamflow originating from groundwater discharge is referred to as:

Options :

1. ✖ surface runoff

2. ✔ base flow

3. ✖ catchment yield

4. ✖ quick flow

Question Number : 22 Question Id : 630680275956 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the given options include mineral pairs correctly matching with the mineral families given below?

A) Pyroxene family

B) Amphibole family

Options :

1. ✖ A: Enstatite, B: Diopside

2. ✔ A: Augite, B: Actinolite

3. ✖ A: Hornblende, B: Jadeite

4. ✖ A: Tremolite, B: Riebeckite

Question Number : 23 Question Id : 630680275957 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following minerals is uniaxial positive and belongs to the hexagonal system?

Options :

1. ✖ Orthoclase

2. ✖ Garnet

3. ✔ Quartz

4. ✖ Apatite

Question Number : 24 Question Id : 630680275958 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A ray of light entering an _____ in directions other than optic axes is split into two rays vibrating at right angles to each other, generally travelling with different velocities and having different refractive indices.

Options :

1. ✖ isotropic mineral

2. ✔ anisotropic mineral

3. ✖ amorphous mineral

4. ✖ opaque mineral

Question Number : 25 Question Id : 630680275959 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the minerals in Group I with their corresponding characteristic properties in Group II.

Group I	Group II
P. Barite	A. Four sets of cleavage
Q. Labradorite	B. High specific gravity
R. Fluorite	C. Iridescence
S. Serpentine	D. Fibrous habit

Options :

1. ✖ P-B, Q-A, R-D, S-C

2. ✖ P-A, Q-B, R-C, S-D

3. ✔ P-B, Q-C, R-A, S-D

4. ✖ P-C, Q-D, R-B, S-A

Question Number : 26 Question Id : 630680275960 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following terms related to the formation of surface water resources with their corresponding descriptions:

Terms:	
I. Oxbow lake	A) A shallow body of water separated from a larger body of water by a barrier such as a sandbar or coral reef.
II. Estuary	B) A temporary lake or pond that forms in a flat desert basin, often from rainwater or occasional flooding.
III. Tidal pool	C) A curved lake or water body that forms when a meandering river changes course, leaving a horseshoe-shaped water feature.
IV. Playa lake	D) A coastal body of water where freshwater from rivers mixes with saltwater from the ocean, creating a brackish environment.
V. Lagoon	E) A small, isolated body of water that forms along rocky coastlines during low tide and may contain marine organisms.

Options :

1. ✖ I-A, II-B, III-C, IV-D, V-E

2. ✔ I-C, II-D, III-E, IV-B, V-A

3. ✖ I-D, II-A, III-E, IV-B, V-C

4. ✖ I-E, II-D, III-C, IV-B, V-A

Question Number : 27 Question Id : 630680275961 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The Ghyben–Herzberg ratio states that, for every meter of fresh water in an unconfined aquifer above sea level, there will be _____ of fresh water in the aquifer below sea level.

Options :

1. ✖ 10 meters

2. ✖ 20 meters

3. ✖ 30 meters

4. ✔ 40 meters

Question Number : 28 Question Id : 630680275962 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Water that has been out of contact with the atmosphere for an appreciable part of the geologic period is termed as:

Options :

1. ✖ juvenile water

2. ✔ connate water

3. ✖ magmatic water

4. ✖ meteoric water

Question Number : 29 Question Id : 630680275963 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Robert F Horton is often called the father of American hydrology. Which of the following statements is true regarding Horton's infiltration Mode?

Options :

1. ✖ The infiltration capacity of soil decreases as soil moisture content increases.

2. ✖ Infiltration occurs primarily through macropores in the soil.

3. ✔ If rainfall exceeds the infiltration capacity, infiltration tends to decrease in an exponential manner.

4. ✖ Surface roughness and topography have no influence on runoff generation.

Question Number : 30 Question Id : 630680275964 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is the correct expression for the storativity (S) of a confined aquifer? (b=saturated thickness of the aquifer, T=Transmissivity and S_S = Specific storage).

Options :

1. ✖ $S= b * T * S_S$

2. ✖ $S= b / S_S$

3. ✔ $S = b * S_S$

4. ✖ $S = (b * T) / S_S$

Question Number : 31 Question Id : 630680275965 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is a dimensionless quantity?

Options :

1. ✖ Transmissivity

2. ✖ Hydraulic conductivity

3. ✖ Compressibility

4. ✔ Storage coefficient

Question Number : 32 Question Id : 630680275966 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The sum of Specific Retention and Specific Yield is:

Options :

1. ✖ hydraulic resistance

2. ✔ porosity

3. ✖ capillarity

4. ✖ hydraulic diffusivity

Question Number : 33 Question Id : 630680275967 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Solid granite is an example of:

Options :

1. ✔ aquifuge

2. ✖ aquitard

3. ✖ aquiclude

4. ✖ aquifer

Question Number : 34 Question Id : 630680275968 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Low potential evapotranspiration at higher elevations _____ recharge conditions.

Options :

1. ✔ enhances

2. ✖ reduces

3. ✖ has no effect on

4. ✖ first enhances and then reduces

Question Number : 35 Question Id : 630680275969 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

An aquifer has a cross-sectional area of 800 m^2 and a hydraulic gradient of 0.01. If water is flowing from the aquifer at the rate of 8 m^3/s, the hydraulic conductivity (in m/s) of the aquifer is _____.

Options :

1. ✔ 1 m/s

2. ✖ 64 m/s

3. ✖ 8 m/s

4. ✖ 10 m/s

Question Number : 36 Question Id : 630680275970 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

If layers of unfractured bedrock sloping are at the same angle as the land surface, then the aquifer recharge will _____.

Options :

1. ✖ decrease to some extent

2. ✖ highly increase

3. ✖ rarely cause any effect

4. ✔ almost completely eliminate

Question Number : 37 Question Id : 630680275971 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct?

A) Oxbow lakes are the landforms formed by the action of rivers.

B) Cirques are erosional landforms formed by glaciers.

C) Eskers are depositional landforms formed by glaciers.

D) Ventifacts are erosional landforms formed by wind action

E) Fjords are depositional landforms formed by the action of seas

Options :

1. ✖ Only A, B and C

2. ✖ Both B and D

3. ✔ A, B, C, D and E

4. ✖ Only A, B, C and D

Question Number : 38 Question Id : 630680275972 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following minerals show low relief i.e., have a refractive index from 1.50-1.58?

Options :

1. ✖ Garnet

2. ✔ Quartz

3. ✖ Hornblende

4. ✖ Augite

Question Number : 39 Question Id : 630680275973 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Water leaks through a coarse sand aquifer having a porosity of 20%, permeability of 40 m/day, and a hydraulic gradient of 1 m per 1000 m. With what velocity does the water move?

Options :

1. ✖ 10 mm/day

2. ✔ 20 mm/day

3. ✖ 40 mm/day

4. ✖ 80 mm/day

Question Number : 40 Question Id : 630680275974 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Artesian condition occurs when the:

Options :

1. ✖ aquifer is unconfined

2. ✖ water table is perched

3. ✖ water table is above ground level

4. ✔ piezometric surface is above the ground level

Question Number : 41 Question Id : 630680275975 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A semi-permeable unit which does not yield any significant quantity of groundwater is called:

Options :

1. ✖ aquifer

2. ✖ aquiclude

3. ✔ aquitard

4. ✖ aquifuge

Question Number : 42 Question Id : 630680275976 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Ratio of discharge to drawdown in a pumping well is known as:

Options :

1. ✖ specific yield

2. ✔ specific capacity

3. ✖ specific retention

4. ✗ specific storage

Question Number : 43 Question Id : 630680275977 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following water-budget component in decreasing order of percentage of annual precipitation:

A) Total discharge to oceans

B) Discharge to oceans from base flow

C) Evapotranspiration

D) Discharge to oceans from surface runoff

E) Infiltration of precipitation

Options :

1. ✗ A, B, C, D, E

2. ✓ E, C, A, D, B

3. ✗ E, D, C, B, A

4. ✗ D, E, C, B, A

Question Number : 44 Question Id : 630680275978 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following in increasing order based on their total water volume, from smallest to largest:

A) Atmospheric water vapour

B) Lakes and rivers

C) Ice caps, Glaciers and Permanent Snow

D) Groundwater

E) Oceans, Seas, and Bays

Options :

1. ✖ B, C, D, E, A

2. ✖ C, D, B, E, A

3. ✔ A, B, D, C, E

4. ✖ D, C, B, A, E

Question Number : 45 Question Id : 630680275979 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The grain density (of solids only) and bulk density (solids + voids) of a sandstone sample are 2.5 g/cm^3 and 2.1 g/cm^3, respectively. The total porosity (in%) of the sample is:

Options :

1. ✔ 16%

2. ✖ 84%

3. ✖ 40%

4. ✖ 46%

Question Number : 46 Question Id : 630680275980 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which drilling method is commonly NOT used for drilling deep water wells?

Options :

1. ✖ Percussion drilling

2. ✖ Rotary drilling

3. ✔ Augering

4. ✖ Rotary-Percussion drilling

Question Number : 47 Question Id : 630680275981 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What is the purpose of cementing in water well design?

Options :

1. ✔ To seal the wellbore and prevent fluid migration between formations

2. ✖ To keep the wellbore temperature under control

3. ✖ To facilitate the logging and testing of the well

4. ✖ To control well pressure and prevent blowouts

Question Number : 48 Question Id : 630680275982 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the option that arranges the following terms related to the vertical distribution of groundwater in increasing order of depth (from top to bottom).

A) Soil water zone

B) Phreatic water

C) Intermediate vadose zone

D) Capillary zone

Options :

1. ✖ A, B, C, D

2. ✖ D, C, B, A

3. ✔ A, C, D, B

4. ✖ C, B, A, D

Question Number : 49 Question Id : 630680275983 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following has the lowest hydraulic conductivity?

Options :

1. ✖ Coarse gravel

2. ✖ Dune sand

3. ✖ Fine sand

4. ✔ Limestone

Question Number : 50 Question Id : 630680275984 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following two statements is/are correct?

Statements:

A) The Aral Sea, located between Kazakhstan and Uzbekistan, has experienced a significant decrease in its water volume over the past few decades.

B) The depletion of the Aral Sea's water volume is primarily attributed to excessive irrigation practices diverting water from the rivers that feed into the sea.

Options :

1. ✔ Both A and B

2. ✖ B only

3. ✖ A only

4. ✖ Neither A nor B

Question Number : 51 Question Id : 630680275985 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is the correct lithostratigraphic Jurassic sequence (older to younger) of Jaisalmer?

Options :

1. ✖ Lathi Fm., Jaisalmer Fm., Bhadasar Fm., Baisakhi Fm.

2. ✔ Lathi Fm., Jaisalmer Fm., Baisakhi Fm., Bhadasar Fm.

3. ✖ Lathi Fm., Bhadasar Fm., Jaisalmer Fm., Baisakhi Fm.

4. ✖ Lathi Fm., Bhadasar Fm., Baisakhi Fm., Jaisalmer Fm.

Question Number : 52 Question Id : 630680275986 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Choose the correct chronological sequence (older to younger) of the stratigraphic units of Vindhyan supergroup of rocks.

Options :

1. ✔ Semri Group, Kaimur Group, Rewa Group, Bhander Group

2. ✖ Bhander Group, Rewa Group, Kaimur Group, Semri Group

3. ✖ Rewa Group, Bhander Group, Semri Group, Kaimur Group

4. ✖ Kaimur Group, Rewa Group, Semri Group, Bhander Group

Question Number : 53 Question Id : 630680275987 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the lithostratigraphic units of India in Group I with their respective ages mentioned in Group II.

Group I:	Group II:
P. Deccan Trap	1. Archaean
Q. Panjal Trap	2. Cretaceous
R. Malani Rhyolite	3. Permian
S. Closepet Granite	4. Proterozoic

Options :

1. ✖ P-1, Q-4, R-2, S-3

2. ✖ P-1, Q-4, R-3, S-2

3. ✔ P-2, Q-3, R-4, S-1

4. ✖ P-4, Q-1, R-3, S-2

Question Number : 54 Question Id : 630680275988 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

As per the lithostratigraphy of the Cretaceous rocks of Tiruchirappalli, Tamil Nadu, _____ is the oldest (earliest) one.

Options :

1. ✖ Trichinopoly group

2. ✔ Uttatur group

3. ✖ Niniyur group

4. ✖ Ariyalur group

Question Number : 55 Question Id : 630680275989 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The rock body that is NOT a part of the Dharwar craton is:

Options :

1. ✖ Closepet granite

2. ✖ Chamundi granite

3. ✔ Bonai granite

4. ✖ Chitradurga granite

Question Number : 56 Question Id : 630680275990 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the option that arranges the following geological time periods in chronological order, from oldest to most recent.

A) Ediacaran

B) Carboniferous

C) Neoproterozoic

D) Palaeozoic

E) Quaternary

Options :

1. ✖ E, B, D, A, C

2. ✖ B, E, D, A, C

3. ✔ C, A, D, B, E

4. ✖ D, E, B, A, C

Question Number : 57 Question Id : 630680275991 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the option that arranges the following geological time periods in chronological order, from the oldest to the most recent.

A) Jurassic

B) Devonian

C) Cretaceous

D) Cambrian

Options :

1. ✖ A, B, C, D

2. ✖ C, B, A, D

3. ✔ D, B, A, C

4. ✖ B, A, C, D

Question Number : 58 Question Id : 630680275992 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following folds has two hinges and three planar limbs?

Options :

1. ✖ Chevron fold

2. ✖ Fan fold

3. ✖ Isoclinal fold

4. ✔ Conjugate fold

Question Number : 59 Question Id : 630680275993 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the columns.

Fold	Interlimb Angle
A) Gentle fold	P) 120°-70°
B) Open fold	Q) 30°-0°
C) Close fold	R) 180°-120°
D) Tight fold	S) 70°-30°

Options :

1. ✖ A-S, B-R, C-P, D-Q

2. ✔ A-R, B-P, C-S, D-Q

3. ✖ A-P, B-S, C-Q, D-R

4. ✖ A-Q, B-S, C-R, D-P

Question Number : 60 Question Id : 630680275994 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following are methods of artificial recharge of groundwater?

A) Basin Method

B) Stream-Channel Method

C) Ditch-and-Furrow Method

D) Flooding Method

E) Recharge Well Method

Options :

1. ✖ A, B and C only

2. ✖ B, C and D only

3. ✖ B, C and E only

4. ✔ A, B, C, D and E

Question Number : 61 Question Id : 630680275995 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following types of unconformities with their respective descriptions.

Unconformity:

A) Disconformity

B) Nonconformity

C) Paraconformity

D) Angular unconformity

Description:

P) Strata on either side of the unconformity are parallel, there is little apparent erosion

Q) Exists where the layers above and below an erosional boundary have the same orientation

R) Strata is deposited on tilted and eroded layers

S) Develops where sediments are deposited on top of an eroded surface of igneous or metamorphic rocks

Options :

1. ✔ A-Q, B-S, C-P, D-R

2. ✖ A-R, B-P, C-S, D-Q

3. ✖ A-P, B-S, C-Q, D-R

4. ✖ A-Q, B-S, C-R, D-P

Question Number : 62 Question Id : 630680275996 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is a blackbody?

Options :

1. ✖ An ideal body that reflects completely all radiation without any absorption

2. ✔ An ideal body that absorbs all radiations incident on it without any reflection

3. ✖ An ideal body that reflects only 50% of the total radiation

4. ✖ An ideal body that reflects only 12% of the total radiation

Question Number : 63 Question Id : 630680275997 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The ultra-violet region in the electromagnetic spectrum has a wavelength range of _____.

Options :

1. ✔ 0.1–0.4 micrometer

2. ✖ 0.4–0.7 micrometer

3. ✖ 0.7–1.0 micrometer

4. ✖ 1.0–3.0 micrometer

Question Number : 64 Question Id : 630680275998 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The Plank equation describes the energy (E) of a photon in terms of its frequency (ν). Which of the following equations represents the Plank equation?

Options :

1. ✖ $E = mc^2$

2. ✔ $E = h\nu$

3. ✖ $E = \lambda\nu$

4. ✖ $E = h/\lambda$

Question Number : 65 Question Id : 630680275999 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are true?

A) Passive remote sensing focuses on land use, land cover analysis and small-scale mapping requirements.

B) Active remote sensing targets areas like flooding, geological data, volcanic eruptions, earthquake disaster management, soil study and mapping of mineral zones.

C) Active remote sensing uses its energy source to illuminate electromagnetic radiation to the target and record the reflected radiation measurement.

D) Passive remote sensing has to use naturally occurring energy that illuminates the target and reflects the electromagnetic radiation to the remote senor to record the electromagnetic radiation.

Options :

1. ✖ A, B and C only

2. ✖ B and D only

3. ✔ A, B, C and D

4. ✖ A and C only

Question Number : 66 Question Id : 630680276000 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements describes the typical spectral reflectance curves for vegetation?

Options :

1. ✖ Vegetation has high reflectance in the visible region and low reflectance in the near-infrared region.

2. ✔ Vegetation has low reflectance in the visible region and high reflectance in the near-infrared region.

3. ✖ Vegetation has high reflectance in both the visible and near-infrared regions.

4. ✖ Vegetation has low reflectance in both the visible and near-infrared regions.

Question Number : 67 Question Id : 630680276001 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements accurately describes a key characteristic of a geo-synchronous orbit?

Options :

1. ✔ It is an orbit that maintains a fixed position relative to a specific location on Earth's surface.

2. ✖ It is an orbit that follows Earth's rotation, completing one orbit per day.

3. ✖ It is an orbit that is highly elliptical, with a high point above Earth's atmosphere.

4. ✖ It is an orbit that is highly inclined, allowing for coverage of different latitudes on Earth.

Question Number : 68 Question Id : 630680276002 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the option that arranges the following Indian satellites in order of their respective launch dates from earliest to most recent.

P) IRS-1A

Q) IRS-P2

R) IRS-1C

S) IRS-P3

T) IRS-1D

U) IRS-P4

Options :

1. ✔ P, Q, R, S, T, U

2. ✖ T, R, U, S, P, Q

3. ✖ U, T, S, R, Q, P

4. ✖ R, U, T, S, P, Q

Question Number : 69 Question Id : 630680276003 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which was the first Indian Remote Sensing Satellite capable of providing in-orbit stereo images?

Options :

1. ✖ Bhaskara-1

2. ✔ CARTOSAT–1

3. ✖ Resourcesat-1

4. ✖ Resourcesat-2

Question Number : 70 Question Id : 630680276004 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following image classification techniques is/are correctly matched with its/their description?

A) Supervised classification - This technique requires training samples with known class labels to classify pixels in an image.

B) Unsupervised classification - This technique groups pixels into clusters based on their spectral properties without the need for predefined training samples.

Options :

1. ✔ Both A and B are correctly matched.

2. ✖ Only A is correctly matched.

3. ✖ Neither A nor B is correctly matched.

4. ✖ Only B is correctly matched.

Question Number : 71 Question Id : 630680276005 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following regions of the electromagnetic spectrum in the increasing order of their wavelengths, from shortest to longest.

A) X-rays

B) Visible light

C) Radio waves

D) Infrared radiation

Options :

1. ✔ A < D < B < C

2. ✖ C < A < B < D

3. ✖ B < C < D < A

4. ✖ D < B < A < C

Question Number : 72 Question Id : 630680276006 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is/are correct regarding the characteristics of incoming shortwave (solar) radiation and outgoing longwave (terrestrial) radiation?

Statement 1: Incoming shortwave radiation has a higher energy intensity compared with outgoing longwave radiation.

Statement 2: Incoming shortwave radiation primarily consists of visible and ultraviolet (UV) wavelengths, while outgoing longwave radiation consists of infrared (IR) wavelengths.

Options :

1. ✔ Both statements 1 and 2 are correct.

2. ✖ Statement 1 is correct, but statement 2 is incorrect.

3. ✖ Statement 1 is incorrect, but statement 2 is correct.

4. ✖ Both statements 1 and 2 are incorrect.

Question Number : 73 Question Id : 630680276007 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following pairs are correctly matched?

P) IRS-P5 – CartoSat-1

Q) Megha-Tropiques – ALtiKa

R) IRS-P6 – ResourceSat-1

S) SARAL – SAPHIR

T) IRS-P4 – OceanSat-1

Options :

1. ✖ P, Q, R, S and T

2. ✖ Only P, R, S and T

3. ✖ Only P, Q, S and T

4. ✔ Only P, R and T

Question Number : 74 Question Id : 630680276008 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is/are true?

P) In a multi-spectral image, water appears in a lighter tone in the IR bands.

Q) Radar waves can penetrate the clouds and the vegetation cover (depending upon the wavelength of the signal and the structure of the vegetation).

R) Microwave remote sensing uses both passive and active sensors (radar) and has also been largely used for the estimation of instantaneous precipitation.

S) Optical remote sensing using the VIS and NIR bands is the most commonly used approach for Snow Cover Area mapping.

Options :

1. ✖ P, Q, R, S

2. ✔ Only Q, R and S

3. ✖ Only P, Q, S and T

4. ✖ Only P, R and T

Question Number : 75 Question Id : 630680276009 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT a meteorological satellite?

Options :

1. ✖ INSAT-4B

2. ✖ KALPANA-1

3. ✔ GSAT-6

4. ✖ INSAT-3D

Question Number : 76 Question Id : 630680276010 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Bairenkonda quartzites belong to which of the following groups?

Options :

1. ✖ Kistna

2. ✔ Nallamalai

3. ✖ Cheyair

4. ✖ Papaghni

Question Number : 77 Question Id : 630680276011 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match Satellite Navigation System with Owned by Country/Union correctly.

Satellite Navigation System:	Owned by Country/Union:
A) GPS	P) USA
B) GLONASS	Q) China
C) Beidou	R) European Union
D) Galileo	S) Russia

Options :

1. ✖ A-S, B-R, C-P, D-Q

2. ✖ A-R, B-Q, C-S, D-P

3. ✔ A-P, B-S, C-Q, D-R

4. ✖ A-Q, B-S, C-R, D-P

Question Number : 78 Question Id : 630680276012 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements about measurement scales and data types is correct?

Options :

1. ✖ Interval data are measured along a scale with a meaningful zero value, while ratio data are measured along an equidistant scale.

2. ✖ Interval data have a meaningful zero value, while ratio data are measured along a scale with equidistant positions.

3. ✔ Interval data are measured along an equidistant scale, while ratio data have a meaningful zero value.

4. ✖ Interval data and ratio data are both discrete types of data.

Question Number : 79 Question Id : 630680276013 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements about DBMS is correct?

Options :

1. ✖ DBMS is used only for creating databases and does not involve data manipulation or retrieval.

2. ✖ DBMS is a hardware component that stores and manages data.

3. ✔ DBMS provides a way to organise and structure data, ensuring data integrity and security.

4. ✖ DBMS is primarily used for creating graphical user interfaces (GUIs) for data entry.

Question Number : 80 Question Id : 630680276014 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A cylindrical sandstone core sample of diameter 0.02 m and length 0.06 m is fully saturated with a brine solution of resistivity 0.314 Ω-m. The resistance of the saturated sample measured in the laboratory is 600 Ω. The formation factor of the sample is _____ (Use π =3.14).

Options :

1. ✖ 12

2. ✔ 10

3. ✖ 30

4. ✖ 20

Question Number : 81 Question Id : 630680276015 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements best describes throughflow of water?

Options :

1. ✖ Throughflow is the vertical movement of water within the soil profile, influenced by gravity and capillary action.

2. ✖ Throughflow refers to the process of water seeping into underground aquifers through permeable layers.

3. ✔ Throughflow is the movement of water horizontally beneath the land surface till it reaches a surface water body, usually when the soil is completely saturated.

4. ✖ Throughflow is the rapid movement of water over the land surface during heavy rainfall events.

Question Number : 82 Question Id : 630680276016 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is/are correct about resistivity sounding?

A) It is a suitable technique that can be applied in exploring for groundwater in anisotropic aquifers such as carbonate rocks.

B) The resistivity variation within a single layer can be considered an expression of the changes in porosity (primary and/or secondary).

Options :

1. ✔ Both A and B

2. ✖ Only B

3. ✖ Only A

4. ✖ Neither A nor B

Question Number : 83 Question Id : 630680276017 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Pulicat Lake is located in which physiographic subdivisions of India?

Options :

1. ✖ The Himalayan Mountains

2. ✖ The Peninsular plateau

3. ✖ The Western Coastal Plains

4. ✔ The Eastern Coastal Plains

Question Number : 84 Question Id : 630680276018 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Choose the most appropriate tool for the estimation of moisture content in a geological formation.

Options :

1. ✔ Calibrated neutron logs

2. ✖ Calibrated long-normal resistivity logs

3. ✖ Caliper or sonic logs

4. ✖ Natural gamma logs

Question Number : 85 Question Id : 630680276019 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The bulk electrical conductivity of soil and rock is dominantly controlled by which of the following factors?

P) The porosity available to be filled by fluid

Q) The electrical conductivity of the pore-filling solution

R) The type and quantity of clay material present

S) The amount of fluid filling the porosity (degree of saturation)

T) The frequency (electrical) at which the measurement is made

Options :

1. ✖ Only P and R

2. ✖ Only Q, R and S

3. ✔ P, Q, R, S and T

4. ✖ Only R, S and T

Question Number : 86 Question Id : 630680276020 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Bouguer correction is a part of:

Options :

1. ✖ Electrical Survey

2. ✔ Gravity Survey

3. ✖ Seismic Survey

4. ✖ Electromagnetic Survey

Question Number : 87 Question Id : 630680276021 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the given geophysical logs with the most suitable property each one is used to measure.

Geophysical Logs:	Property measured:
A) Resistivity log	P) Average compressional–wave transit time
B) Gamma-gamma log	Q) Electron density
C) Neutron log	R) Both resistivity and volume of fluid in interconnected pores
D) Acoustic Velocity log	S) Hydrogen content

Options :

1. ✖ A-S, B-R, C-P, D-Q

2. ✔ A-R, B-Q, C-S, D-P

3. ✖ A-R, B-P, C-Q, D-S

4. ✖ A-Q, B-S, C-R, D-P

Question Number : 88 Question Id : 630680276022 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following parameters can be measured in the field to reduce the quality-related data alteration between sampling and laboratory analysis of groundwater?

A) Temperature

B) pH

C) Total dissolved solids

D) Eh

E) EC

Options :

1. ✖ Only A, B and C

2. ✖ Only B and D

3. ✔ A, B, C, D and E

4. ✖ Only A, B, C and D

Question Number : 89 Question Id : 630680276023 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The value of free air correction at an elevation of 200 m is _____ mGal (Assume sea-level as datum plane).

Options :

1. ✖ 46.29

2. ✔ 61.72

3. ✖ 90.60

4. ✖ 20.41

Question Number : 90 Question Id : 630680276024 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A Wenner array with 90 m spacing between current electrodes is placed over an inhomogeneous ground. If the measured potential difference and current flow in sub-surface are 20 mV and 10 mA, respectively, the apparent resistivity will be _____ Ω-m (Use $\pi = 3.14$).

Options :

1. ✖ 282.3

2. ✖ 564.5

3. ✔ 376.8

4. ✖ 188.4

Question Number : 91 Question Id : 630680276025 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A Schlumberger array with current electrode separation 40 m and potential electrode separation 4 m is placed over an inhomogeneous medium. If the measured potential difference is 40 mV and the computed apparent resistivity is 80 Ω-m, then the magnitude of current passing through the sub-surface is _____ mA (Use $\pi = 3.14$).

Options :

1. ✖ 252.23

2. ✔ 155.43

3. ✖ 512.21

4. ✖ 323.72

Question Number : 92 Question Id : 630680276026 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In a Magneto-Telluric experiment over a homogeneous and isotropic half-space, the apparent resistivity is 40 Ω-m for an electric field intensity of 10 $mVkm^{-1}$ and time period of 8 s. The magnetic field strength is ____ nT.

Options :

1. ✖ 40

2. ✖ 100

3. ✖ 20

4. ✔ 2

Question Number : 93 Question Id : 630680276027 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The following gamma ray (GR) log data are recorded in a borehole.

GR log value against a formation = 40 API units.

Maximum GR log value = 50 API units.

Minimum GR log value = 30 API units.

What is the fraction of shale in the formation?

Options :

1. ✖ 0.2

2. ✖ 0.3

3. ✖ 0.4

4. ✔ 0.5

Question Number : 94 Question Id : 630680276028 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

For an axial dipole-dipole configuration, what is the apparent resistivity (in Ω-m) if 2.0 A current flowing between current electrodes produces 12 mV potential difference between potential electrodes? Given, the distance of separation between two current electrodes is 8 m; the current electrode and the potential electrode towards the inner side are separated by 64 m. (Use π =3.14).

Options :

1. ✖ 200.24

2. ✖ 54.26

3. ✔ 108.52

4. ✖ 96

Question Number : 95 Question Id : 630680276029 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The source utilised by the VLF method is electromagnetic radiation generated in the frequency band of:

Options :

1. ✖ 0.5–2 kHz

2. ✖ 100–250 kHz

3. ✔ 15–25 kHz

4. ✖ 70-90 kHz

Question Number : 96 Question Id : 630680276030 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Select the correct statement(s) related to induced polarisation (IP) method.

A) In the time-domain IP surveying, the measurement of a decaying voltage is done over a certain time interval.

B) In the frequency-domain IP surveying, measurement of apparent resistivity is done at two or more low DC frequencies.

Options :

1. ✔ Only A

2. ✖ Only B

3. ✖ Both A and B

4. ✖ Neither A nor B

Question Number : 97 Question Id : 630680276031 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

What principle forms the basis of land magnetic surveys?

Options :

1. ✔ Detection of changes in the Earth's magnetic field caused by subsurface features.

2. ✖ Analysis of seismic wave reflections and refractions.

3. ✖ Measurement of variations in the Earth's gravitational forces.

4. ✖ Measurement of electrical conductivity of subsurface materials.

Question Number : 98 Question Id : 630680276032 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

In a Piper diagram, the interpretation of the relative position of a water sample point is primarily based on:

Options :

1. ✖ total dissolved solids (TDS) concentration

2. ✖ pH and alkalinity values

3. ✔ concentrations of major ions

4. ✖ organic matter content

Question Number : 99 Question Id : 630680276033 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is correct?

A) Permeability index is concerned with four ions, namely, Na^{+}, Ca^{2+}, Mg^{2+} and HCO^{3-}, and it indicates the suitability of water for irrigation purposes.

B) Higher Electrical Conductivity readings imply inorganic dissolved solids such as Cl^{-}, SO_4^{2-}, Na^{+} and Ca^{2+}.

C) Total Hardness is dependent mainly on the presence of alkaline earths, Ca^{2+} and Mg^{2+} ions.

D) Sodium Adsorption Ratio (SAR) is a measure of groundwater suitability for use in agricultural irrigation activities.

E) The bicarbonate content of groundwater is expressed by the residual sodium carbonate, where high concentrations of bicarbonate lead to an increase in pH value that may cause dissolution of organic matter.

Options :

1. ✔ A, B, C, D, E

2. ✖ Only A, C, D and E

3. ✖ Only C, D and E

4. ✖ Only C and D

Question Number : 100 Question Id : 630680276034 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following parameters is commonly used as an indicator of water's acidity or alkalinity?

Options :

1. ✔ pH

2. ✖ Turbidity

3. ✖ Conductivity

4. ✖ Total Dissolved Solids (TDS)

Question Number : 101 Question Id : 630680276035 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following instruments/techniques with their specific application and/or characteristics.

Instruments/ Techniques	Specific Application and/or Characteristics
P) Cavity Ring-Down Spectroscopy (CDRS)	I) Utilises laser attenuation to measure the concentration of stable isotopes (D, ^{13}C, ^{18}O and ^{15}N) in water, water vapour and gases (including CO_2, CH_4 and N_2O). Measurements are made by the degree of absorbance of pulsed laser light.
Q) Total Carbon Elemental Analyser Interfaced with Isotope Ratio Mass Spectrometry (TC-EA-IRM)	II) High-temperature (pyrolysis) conversion of solid samples followed by gas separation (CO and H_2) for elemental analysis, using a He carrier gas.
R) Thermal Ionisation Mass Spectrometer (TIMS)	III) Enables high-precision measurement of isotopic ratios in trace elements. Samples are prepared as coatings on the source filament and ionised by resistance heating of the filament.
S) Quadrupole Mass Spectrometer (QMS)	IV) Offers qualitative and quantitative analysis of organic compounds in water samples, aiding in the assessment of water contamination. It uses a radio frequency through the four rods to generate a magnetic field.
T) Noble Gas Mass Spectrometer (NGMS)	V) Measures the abundance of noble gases in water, providing insights into groundwater recharge and circulation patterns.

Options :

1. ✔ P-I, Q-II, R-III, S-IV, T-V

2. ✖ P-V, Q-I, R-II, S-III, T-IV

3. ✖ P-IV, Q-V, R-I, S-II, T-III

4. ✖ P-III, Q-IV, R-V, S-I, T-II

Question Number : 102 Question Id : 630680276036 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct?

A) Ratio of faecal coliform (FC) to faecal streptococci (FS) more than 2 : 1 generally suggests that the groundwater is polluted with human faecal wastes.

B) *Escherichia coli* is the most common type of bacteria present in FCs.

C) *E. coli* are commonly found in the human intestine but are not usually harmful.

D) Membrane filtration (MF) and the most probable number (MPN) methods are commonly used for counting bacteria in groundwater samples.

Options :

1. ✖ Only A and C

2. ✖ Only A and D

3. ✖ Only A, B and C

4. ✔ A, B, C and D

Question Number : 103 Question Id : 630680276037 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which bacterial disease is commonly associated with groundwater contamination?

Options :

1. ✔ Cholera

2. ✖ Tuberculosis

3. ✖ Malaria

4. ✖ Influenza

Question Number : 104 Question Id : 630680276038 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is a standard laboratory technique that is commonly used to analyse certain heavy metals in aqueous samples?

Options :

1. ✖ Electron Probe Micro-analyser (EPMA)

2. ✔ Atomic Absorption Spectroscopy (AAS)

3. ✖ X-ray Diffraction (XRD)

4. ✖ X-ray Fluorescence (XRF)

Question Number : 105 Question Id : 630680276039 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding groundwater sampling and analysis?

A) If the purpose is to assess the groundwater quality variation spatially, then a set of representative wells must be selected for water sampling.

B) For dynamic groundwater quality change, one may take water sampling as in the previous step but on monthly, seasonal or annual periods.

C) Short-term local and temporal groundwater quality variations can be traced during a pumping test.

D) Some of the quality variables can be measured easily in the field (pH, electrical conductivity) and others in the laboratory.

Options :

1. ✖ Only A and C

2. ✖ Only A and D

3. ✖ Only A, B and C

4. ✔ A, B, C and D

Question Number : 106 Question Id : 630680276040 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is true regarding groundwater quality,sampling and analysis?

Options :

1. ✖ Anthropogenic influences have no impact on groundwater quality.

2. ✖ Laboratory analysis is the only method used to determine groundwater quality variations.

3. ✖ Groundwater monitoring should be conducted sporadically, without considering the purpose of water supply.

4. ✔ Monitoring wells should be strategically located to capture possible contamination traces.

Question Number : 107 Question Id : 630680276041 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Isohyets are lines connecting points on a map having equal (same amount of):

Options :

1. ✔ rainfall

2. ✖ humidity

3. ✖ geopotential height

4. ✖ dewpoint

Question Number : 108 Question Id : 630680276042 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is an example of non-point source pollution in groundwater?

Options :

1. ✖ Underground storage tank leak

2. ✖ Industrial wastewater discharge

3. ✖ Spill from a chemical manufacturing facility

4. ✔ Agricultural runoff from fields

Question Number : 109 Question Id : 630680276043 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following parameters is NOT typically considered in assessing water quality for irrigation purposes according to irrigation water criteria?

Options :

1. ✖ Sodium adsorption ratio (SAR)

2. ✖ Chloride levels

3. ✔ Dissolved oxygen (DO) concentration

4. ✖ Electrical conductivity (EC)

Question Number : 110 Question Id : 630680276044 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The isotopic composition of water varies due to different isotopes of hydrogen and oxygen and their behaviour during various processes. Which of the following statements accurately describes the behaviour of isotopes during water vaporisation and condensation?

Options :

1. ✖ Water vaporisation enriches the vapor with heavier isotopes, while water condensation enriches the rain or snow with lighter isotopes.

2. ✔ Water vaporisation enriches the vapor with lighter isotopes, while water condensation enriches the rain or snow with heavier isotopes.

3. ✖ Water vaporisation and water condensation have no effect on the isotopic composition of water.

4. ✖ Water vaporisation and water condensation result in an equal enrichment of both heavier and lighter isotopes in the water.

Question Number : 111 Question Id : 630680276045 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the three phases of water with their correct specific heats.

Three Phases of Water:	Specific Heats:
A) Ice at 0°C	P) 1 cal/g/°C
B) Liquid water at 25°C	Q) 2.01 J/g/°C
C) Vapour at 100°C	R) 2.03 J/g/°C

Options :

1. ✖ A-P, B-Q, C-R

2. ✖ A-R, B-P, C-Q

3. ✖ A-Q, B-R, C-P

4. ✔ A-R, B-Q, C-P

Question Number : 112 Question Id : 630680276046 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Choose the correct pairs of ions present in the groundwater and associated major natural sources.

P. Ca^{2+} – Amphiboles, Feldspars

Q. Mg^{2+} – Dolomite, Magnesite

R. Na^{+} – Evaporites, Clay minerals

S. SO_4^{2} – Gypsum, Anhydrite

Options :

1. ✖ Only P and R

2. ✖ Only Q and S

3. ✖ Only P, Q and R

4. ✔ P, Q, R and S

Question Number : 113 Question Id : 630680276047 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Arrange the following terms for groundwater salinity in the order of decreasing Cl^{-} concentration.

P. Fresh brackish

Q. Fresh

R. Salt

S. Brackish

T. Hypersaline

U. Brackish-salt

Options :

1. ✖ P, Q, R, S, T, U

2. ✔ T, R, U, S, P, Q

3. ✖ U, T, S, R, Q, P

4. ✖ R, U, T, S, P, Q

Question Number : 114 Question Id : 630680276048 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following specific diseases caused by element toxicity in drinking water with their respective causative elements.

Diseases:	Elements:
I) Itai-itai disease	A) Arsenic
II) Minamata disease	B) Mercury
III) Blackfoot disease	C) Cadmium
IV) Methemoglobinemia	D) Nitrate

Options :

1. ✖ I-A, II-B, III-C, IV-D

2. ✔ I-C, II-B, III-A, IV-D

3. ✖ I-C, II-D, III-A, IV-B

4. ✖ I-A, II-B, III-D, IV-C

Question Number : 115 Question Id : 630680276049 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the acceptable limits for the given trace elements in drinking water as per World Health Organization standards.

Trace elements:	Acceptable limits:
A) Arsenic	P) 30 µg/L
B) Mercury	Q) 70 µg/L
C) Uranium	R) 6 µg/L
D) Lead	S) 10 µg/L

Options :

1. ✔ A-S, B-R, C-P, D-Q

2. ✖ A-P, B-Q, C-S, D-R

3. ✖ A-R, B-P, C-Q, D-S

4. ✖ A-Q, B-S, C-R, D-P

Question Number : 116 Question Id : 630680276050 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements regarding control measures/treatment methods of contaminated water are correct?

A) Microbial decomposition refers to the breakdown of contaminants in groundwater by microorganisms, converting them into harmless substances through biological processes.

B) Chemical processes involve the use of chemical agents or reactions to transform or neutralise contaminants present in groundwater, rendering them less harmful or non-toxic.

C) Dilution is an effective control measure for groundwater contamination, wherein the contaminated water is mixed with a larger volume of clean water to reduce the concentration of pollutants.

D) Sorption is a chemical process that removes suspended particles and larger contaminants from groundwater, typically through the use of porous media such as sand or activated carbon.

Options :

1. ✖ Only A and C

2. ✖ Only A and D

3. ✔ Only A, B and C

4. ✖ A, B, C and D

Question Number : 117 Question Id : 630680276051 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

There is an unconfined aquifer, which is the primary source of drinking water for a town. Hydraulic conductivity, porosity and hydraulic gradient in this aquifer are 5×10^{-5} m/s, 0.4 and 0.08, respectively. After how many days will a contaminant from a point source located at a distance 90 m from the town affect the town in terms of water quality?

Options :

1. ✖ 52 days

2. ✔ 104 days

3. ✖ 84 days

4. ✖ 16 days

Question Number : 118 Question Id : 630680276052 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which transport mechanism is primarily responsible for the long-range migration of contaminants in groundwater systems, allowing them to travel significant distances from the original source?

Options :

1. ✔ Advection

2. ✖ Diffusion

3. ✖ Dispersion

4. ✖ Sorption

Question Number : 119 Question Id : 630680276053 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is/are correct?

A) Arsenic is strongly absorbed by clay minerals and increases in solubility when redox potential is low.

B) Arsenic compounds are plant macronutrients and are generally abundant in soils throughout the world.

Options :

1. ✔ A only

2. ✖ B only

3. ✖ Both A and B

4. ✖ Neither A nor B

Question Number : 120 Question Id : 630680276054 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is/are correct?

A) High concentrations of fluoride in drinking water can cause bone disease and mottling of tooth enamel.

B) As per World Health Organization (WHO) the upper limit of fluoride concentrations in drinking water is 1.5 mg/L.

Options :

1. ✖ A only

2. ✖ B only

3. ✔ Both A and B

4. ✖ Neither A nor B

Question Number : 121 Question Id : 630680276055 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the option that arranges the following events related to greenhouse effect, global warming and ozone layer depletion in chronological order from the earliest occurrence to the newest.

A) Discovery of the Antarctic ozone hole

B) Ratification of the Montreal Protocol

C) Signing of the Kyoto Protocol

D) First scientific recognition of the greenhouse effect

Options :

1. ✖ D - B - C - A

2. ✔ D - A - B - C

3. ✖ B - D - C - A

4. ✖ B - C - D - A

Question Number : 122 Question Id : 630680276056 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is the primary cause of acid rain?

Options :

1. ✔ Atmospheric emissions of sulphur dioxide and nitrogen oxides caused by combustion of fossil fuels.

2. ✖ Emissions of carbon dioxide (CO_2) from industrial activities

3. ✖ Release of volatile organic compounds (VOCs) from manufacturing processes

4. ✖ Discharge of heavy metals from mining operations

Question Number : 123 Question Id : 630680276057 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Conceptual hydrological models are sometimes also called:

Options :

1. ✖ black-box models

2. ✔ grey-box models

3. ✖ white-box models

4. ✖ red-box models

Question Number : 124 Question Id : 630680276058 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify whether the following statements related to stochastic and deterministic models in hydrology are correct or incorrect.

Statements:

1) Stochastic models incorporate uncertainties and randomness in hydrological processes, while deterministic models assume known inputs and system behaviour.

2) Stochastic models use historical data and empirical relationships to simulate hydrological processes, while deterministic models use mathematical equations based on physical principles.

Options :

1. ✔ Both statements are correct.

2. ✖ Statement 1 is correct, but statement 2 is incorrect.

3. ✖ Statement 1 is incorrect, but statement 2 is correct.

4. ✖ Both statements are incorrect.

Question Number : 125 Question Id : 630680276059 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify whether the following statements are correct or incorrect.

Statements:

1) Lumped parameter models represent a hydrological system using physically-based equations, while distributed parameter models utilise statistical approaches and empirical relationships.

2) Lumped parameter models assume uniform properties and average characteristics for the entire system, while distributed parameter models account for spatial variability and represent the system as interconnected subunits.

Options :

1. ✖ Both statements are incorrect.

2. ✖ Statement 1 is correct, but statement 2 is incorrect.

3. ✖ Statement 1 is incorrect, but statement 2 is correct.

4. ✔ Both statements are correct.

Question Number : 126 Question Id : 630680276060 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements are correct regarding hydrological models?

A. Lumped conceptual and Empirical models are deterministic methods.

B. Probabilistic and Stochastic models are statistical methods.

C. Deterministic and statistical methods are types of non-optimising hydrological models.

D. Distributed physically-based methods are types of optimising hydrological models.

Options :

1. ✖ A, B, C and D

2. ✖ A and B only

3. ✖ C and D only

4. ✔ A, B and C only

Question Number : 127 Question Id : 630680276061 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the option that arranges the following hydrological models in oldest to newest chronological order of development.

P. White box

Q. Grey box

R. Black box

Options :

1. ✖ R, P, Q

2. ✖ P, Q, R

3. ✔ R, Q, P

4. ✖ Q, P, R

Question Number : 128 Question Id : 630680276062 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which method is NOT commonly used for well rehabilitation?

Options :

1. ✖ Chemical treatment to remove mineral deposits

2. ✖ Surge block treatment to clear clogged screens

3. ✖ Mechanical brushing to remove biofouling

4. ✔ Over pumping of the well beyond its design capacity

Question Number : 129 Question Id : 630680276063 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements related to hydrological models is/are correct?

A. A physical model is a replica of the prototype and is constructed by some physical material.

B. A mathematical model is a quantitative description of the processes or phenomena by using a collection of mathematical, logical statements, initial and boundary conditions, expressing relationships between input and output.

Options :

1. ✖ A only

2. ✖ B only

3. ✔ Both A and B

4. ✖ Neither A nor B

Question Number : 130 Question Id : 630680276064 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the option that arranges the following developments in the history of hydrologic modelling in chronological order.

A) Mulvany's development of the rational method

B) Green and Ampt's theory of infiltration

C) Horton's development of erosion and streamflow generation

D) Theis's investigation of the subsurface phase of the hydrologic cycle

E) Nash's theory of the instantaneous unit hydrograph

F) Lighthill and Whitham's development of kinematic wave theory

G) Crawford and Linsley's development of the Stanford Watershed Model

Options :

1. ✖ A, C, E, F, D, B, G

2. ✖ B, C, A, D, F, E, G

3. ✔ C, A, D, E, F, B, G

4. ✖ D, C, B, A, E, F, G

Question Number : 131 Question Id : 630680276065 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The Antecedent Precipitation Index (API) is a black-box model used in hydrological forecasting. Which of the following statements best describes the API model?

Options :

1. ✖ The API model calculates the potential evapotranspiration rates based on historical data to estimate future precipitation patterns.

2. ✖ The API model uses satellite data to determine the antecedent precipitation levels and predicts future rainfall based on the established patterns.

3. ✔ The API model incorporates historical rainfall data and calculates an index that represents the soil moisture condition, which is used to forecast the potential for floods or droughts.

4. ✖ The API model analyses weather radar data to identify potential areas of heavy rainfall and predicts the occurrence of extreme weather events.

Question Number : 132 Question Id : 630680276066 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following terms are correctly paired with their descriptions?

A) Rising limb of a hydrograph – Reflects the rate of increase of the river discharge from the peak rainfall intensity

B) Bankfull Discharge – The flow at which water just fills a channel without overtopping the banks

C) Lag Time in hydrology – Time period between maximum rainfall and maximum discharge

D) Recession limb of a hydrograph – Represents the rate of decrease of the river discharge

Options :

1. ✖ A ,B, C and D

2. ✖ A, B and C only

3. ✖ D and C only

4. ✔ A, B and D only

Question Number : 133 Question Id : 630680276067 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following conceptual hydrological models with their corresponding descriptions.

Models:	Acceptable limits:
A) Tank Model	P) This model is commonly used for flood forecasting and simulation, focusing on the representation of surface runoff and its routing through the river network.
B) Xinanjiang Model	Q) This model is widely used for rainfall-runoff simulation, particularly in humid and semi-humid regions, and incorporates multiple components such as infiltration, surface runoff and base flow.
C) Sacramento Model	R) This model conceptualises the hydrological system as a series of interconnected storage tanks representing different components of the water cycle, such as precipitation, evapotranspiration and runoff.

Options :

1. ✖ A-Q, B-P, C-R

2. ✖ A-P, B-R, C-Q

3. ✔ A-R, B-P, C-Q

4. ✖ A-Q, B-R, C-P

Question Number : 134 Question Id : 630680276068 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements accurately describes the Tank Conceptual Model?

Options :

1. ✖ The Tank Model incorporates a single tank to represent the entire hydrological system and generates surface runoff as the only output.

2. ✖ The Tank Model consists of multiple vertically arranged tanks, with each tank representing a specific hydrological process such as infiltration, percolation or evapotranspiration.

3. ✔ The Tank Model utilises a series of tanks to simulate surface runoff, subsurface flow, intermediate flow, sub-base flow and base flow, as well as phenomena like infiltration and water storage.

4. ✖ The Tank Model focuses on evaporation and evapotranspiration as the primary inputs and calculates the water storage capacity of the tanks based on the hydrological conditions.

Question Number : 135 Question Id : 630680276069 Is Question Mandatory : No Calculator :

None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Lysimeter is:

Options :

1. ✖ an instrument to estimate the soil water content using a radioactive source of fast neutrons

2. ✖ a tube with holes at the base that is placed at a depth within a soil or rock mantle to measure the water pressure at a set location

3. ✖ a technique to investigate the magnitude–frequency relationship for low flows in a particular river

4. ✔ a device for collecting water from the pore spaces of soils and for determining the soluble constituents removed in the drainage

Question Number : 136 Question Id : 630680276070 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following is NOT a characteristic of fully distributed, physically based hydrological models?

Options :

1. ✖ They are based on the understanding of the physics of catchment processes.

2. ✖ They use numerical methods to solve governing partial differential equations.

3. ✔ They are computationally efficient and have low data requirements.

4. ✖ They simulate the spatial variation in hydrological conditions in a catchment.

Question Number : 137 Question Id : 630680276071 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following hydrological equations with their corresponding infiltration models.

Hydrological Equations	Their Infiltration Models
A. Kostiakov equation	P. Assumes a linear relationship between cumulative infiltration and time
B. Horton equation	Q. Assumes a power-law relationship between cumulative infiltration and time
C. Holtan equation	R. Assumes an exponential relationship between infiltration rate and time

Options :

1. ✖ A-P, B-Q, C-R

2. ✔ A-Q, B-P, C-R

3. ✖ A-R, B-P, C-Q

4. ✖ A-R, B-Q, C-P

Question Number : 138 Question Id : 630680276072 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Artificial Neural Network (ANN) is a commonly used technique in hydrological modelling due to its ability to capture complex non-linear relationships. Which of the following statements is true regarding ANN hydrological models?

Options :

1. ✖ ANN models use biological neurons to simulate hydrological processes.

2. ✖ ANN models are solely based on statistical analysis of historical hydrological data.

3. ✔ ANN models can approximate any continuous function, making them suitable for modelling complex hydrological systems.

4. ✖ ANN models require a large number of input variables to accurately represent hydrological processes.

Question Number : 139 Question Id : 630680276073 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The size of a Milli watershed is:

Options :

1. ✖ 10,000 to 50,000 Ha

2. ✔ 1000 to 10,000 Ha

3. ✖ 100 to 1000 Ha

4. ✖ 1 to 100 Ha

Question Number : 140 Question Id : 630680276074 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following terms is/are correctly paired with their definitions?

A) Precipitation rate: The precipitation at a specific location, expressed as a water layer thickness over a horizontal surface during a period of observation

B) Evaporation rate: The water loss through evaporation at a specific location, expressed as a water layer thickness over a horizontal surface during a period of observation

C) Discharge rate: The total discharge at a specific location, expressed as a water layer thickness over a horizontal surface during a period of observation

Options :

1. ✖ A only

2. ✖ B only

3. ✖ B and C only

4. ✔ A, B and C

Question Number : 141 Question Id : 630680276075 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

A monthly mean air temperature of 27°C and a monthly mean of relative air humidity of 79% was recorded for the month of February. Using Schendel's method, the potential evapotranspiration rate (mm/month) for the given values is:

Options :

1. ✖ 4.8

2. ✔ 16.4

3. ✖ 3.42

4. ✖ 21.33

Question Number : 142 Question Id : 630680276076 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Identify the option that arranges the following national projects of India related to watershed and agriculture practices in chronological order, from earliest to most recent.

A) Drought Prone Areas Program (DPAP)

B) Integrated Watershed Management Program (IWMP)

C) National Watershed Development Project for Rainfed Areas (NWDPRA)

D) Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

Options :

1. ✖ A, B, C, D

2. ✔ A, C, B, D

3. ✖ C, D, B, A

4. ✖ B, C, A, D

Question Number : 143 Question Id : 630680276077 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The storage coefficient is the product of:

Options :

1. ✔ specific storage coefficient and groundwater thickness

2. ✖ hydraulic resistance and groundwater thickness

3. ✖ specific yield and specific retention

4. ✖ storativity and specific storage coefficient

Question Number : 144 Question Id : 630680276078 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements accurately describes the Weibull formula in hydrology?

Options :

1. ✖ The Weibull formula is used to calculate the velocity of water in open channels.

2. ✔ The Weibull formula is a mathematical model used to describe the distribution of extreme events, such as floods or wind speeds.

3. ✖ The Weibull formula is an equation that calculates the sediment transport capacity of a river.

4. ✖ The Weibull formula is used to estimate the evapotranspiration rate in hydrological modelling.

Question Number : 145 Question Id : 630680276079 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the following hydrological parameters with their descriptions.

Hydrological Parameters:	Their Descriptions:
I. Precipitation	A) The volume of water flowing through a stream or river at a given point.
II. Evapotranspiration	B) The process of water seeping into the soil from the land surface.
III. Infiltration	C) The combined loss of water to the atmosphere through evaporation from land surfaces and transpiration from plants.
IV. Runoff	D) The amount of moisture, in the form of rain, snow, sleet or hail, that falls on the watershed over a specific period.
V. Streamflow	E) The portion of precipitation that flows over the land surface, eventually reaching streams, rivers and other water bodies.

Options :

1. ✖ I-A, II-B, III-C, IV-D, V-E

2. ✖ I-E, II-A, III-B, IV-C, V-D

3. ✔ I-D, II-C, III-B, IV-E, V-A

4. ✖ I-B, II-C, III-D, IV-E, V-A

Question Number : 146 Question Id : 630680276080 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

The objectives of National Watershed Development Programme for Rain fed Areas (NWDPRA) are:

A. conservation, development and sustainable management of natural resources including their use

B. enhancement of agricultural productivity and production in a sustainable manner

C. restoration of ecological balance in the degraded and fragile rainfed ecosystems by greening these areas through appropriate mix of trees, shrubs and grasses

D. reduction in regional disparity between irrigated and rainfed areas

E. creation of sustained employment opportunities for the rural community including the landless

Options :

1. ✔ A, B, C, D and E

2. ✖ A, C, D and E only

3. ✖ C, D and E only

4. ✖ C and D only

Question Number : 147 Question Id : 630680276081 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statement/s related to various characteristics of watersheds and their effects on hydrograph is/are correct?

A. Higher stream order increases time of concentration, time to peak and base time.

B. Higher form factor increases peak discharge and reduces time of concentration and base time.

Options :

1. ✖ A only

2. ✖ B only

3. ✔ Both A and B

4. ✖ Neither A nor B

Question Number : 148 Question Id : 630680276082 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Match the columns.

Elongation ratio	Shape of watershed
I. < 0.7	P. Oval
II. 0.8 - 0.7	Q. Elongated
III. 0.9 - 0.8	R. Less elongated
IV. > 0.9	S. Circular

Options :

1. ✖ I-P, II-Q, III-R, IV-S

2. ✖ I-S, II-P, III-Q, IV-R

3. ✖ I-R, II-S, III-P, IV-Q

4. ✔ I-Q, II-R, III-P, IV-S

Question Number : 149 Question Id : 630680276083 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following best describes integrated watershed management?

Options :

1. ✖ The management of water resources within a single river basin

2. ✔ The process of sustaining and enhancing the coordination of land, water and related resources within a specific watershed, thereby protecting and restoring ecosystem services for environmental, social and economic benefit

3. ✖ The restoration of wetlands and water bodies within a designated watershed

4. ✖ The regulation of land use activities to prevent water pollution

Question Number : 150 Question Id : 630680276084 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2 Wrong Marks : 0

Which of the following statements is/are correct?

A) The size of a watershed depends on the location of the outlet and it is largest when the streams or river of that watershed discharges directly into an ocean.

B) The micro-watershed scale is the smallest scale for conducting a hydrologic study for studying the different components of hydrologic cycle.

Options :

1. ✖ A only

2. ✖ B only

3. ✔ Both A and B

4. ✖ Neither A nor B