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# TCSiON CAE

## Notations :

- Options shown in green color and with ✓ icon are correct.
- Options shown in red color and with ✗ icon are incorrect.

Question Paper Name :	PC22182 WATER RESOURCES NON GAZ2218
Subject Name :	PC22182 Water Resources NON GAZ2218
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 :	Can't 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 : 630680279752 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

The Nebular hypothesis was put forward to explain:

### Options :

- ✗ volcanic eruption
- ✗ the origin of earthquakes
- ✓ the origin of solar system
- ✗ the origin of mountains

**Question Number : 2 Question Id : 630680279753 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

In order to calculate the age of earth out of various methods, the best suited method is based on which of the given option?

### Options :

- ✗ Rate of sedimentation in ocean
- ✓ Radioactivity
- ✗ Rate of accumulation of sodium in ocean
- ✗ Thickness of sedimentary rocks

**Question Number : 3 Question Id : 630680279754 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

While studying the interior structure of earth, the mohorovicic discontinuity is found in:

**Options :**

1. ✓ the crust
2. ✗ the mantle
3. ✗ the outer core
4. ✗ the inner core

**Question Number : 4 Question Id : 630680279755 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

In course of referring plate tectonics, the process of sea floor spreading is found due to presence of:

**Options :**

1. ✓ divergent boundaries
2. ✗ convergent boundaries
3. ✗ transform boundaries
4. ✗ conservative plate boundaries

**Question Number : 5 Question Id : 630680279756 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

In terms of a volcanic activity, pyroclast is referred to as:

**Options :**

1. ✗ liquid material erupted by volcano
2. ✓ solid material thrown out by volcano
3. ✗ gaseous steam of volcanic eruption
4. ✗ crater lake formed by volcano

**Question Number : 6 Question Id : 630680279757 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following terms is NOT related to physical weathering under geological concept?

**Options :**

1. ✗ Exudation
2. ✗ Scree deposit
3. ✗ Insolation
4. ✓ Carbonation

**Question Number : 7 Question Id : 630680279758 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Select the correct statement regarding a graded stream of a river in context of geological work of rivers.

**Options :**

1. ✓ It is found in foothills and plains.
2. ✗ It has higher velocity than degrading streams.
3. ✗ It has more eroding power than degrading streams.
4. ✗ It does not have sufficient velocity to carry sediment load.

**Question Number : 8 Question Id : 630680279759 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are correct?

- A. Trellis drainage pattern of rivers have perpendicular subsequent streams.
- B. Trellis drainage pattern of rivers have inclined obsequent streams.

**Options :**

1. ✓ Only A
2. ✗ Only B
3. ✗ Both A and B
4. ✗ Neither A nor B

**Question Number : 9 Question Id : 630680279760 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

While considering the following two statements:

1. Eluvium as a product of weathering is associated by movement of disintegrated rocks.
2. Deluvium as a product of weathering is NOT associated by movement of disintegrated rocks.

Which of the above statement(s) is/are correct?

**Options :**

1. ✗ Statement 1 is correct and Statement 2 is incorrect
2. ✗ Statement 2 is correct and Statement 1 is incorrect
3. ✗ Both statements 1 and 2 are correct
4. ✓ Neither statement 1 nor 2 is correct

**Question Number : 10 Question Id : 630680279761 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statements are correct?

1. Hammada is a geological feature produced by glaciers.
2. Oasis is a lake type geological feature created by wind deflation.
3. Dunes are geological features created by abrasion of wind.

**Options :**

1. ✗ Only 1 and 2
2. ✗ All 1, 2 and 3
3. ✓ Only 1 and 3
4. ✗ Only 2 and 3

**Question Number : 11 Question Id : 630680279762 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Match the following with reference to mineral properties/ types and their interpretation under geology.

Mineral Properties/ types	Interpretation
A. Optical property of mineral	1. Colour of powder
B. Allochromatic mineral	2. Refractive index
C. Streak of mineral	3. Flat layered
D. Bladed mineral	4. Variable colour

**Options :**

1. ✗ A-4; B-3; C-2; D-1
2. ✗ A-2; B-1; C-4; D-3
3. ✓ A-2; B-4; C-1; D-3
4. ✗ A-4; B-2; C-3; D-1

**Question Number : 12 Question Id : 630680279763 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Select the correct pair(s) of geological features and natural agencies.

- A. Talus slope : Atmospheric temperature
- B. Yardangs : River
- C. Ventifacts : River
- D. Delta : Ground water

**Options :**

1. ✓ Only A
2. ✗ Only B
3. ✗ B and D

4. ✘ A, B and C

**Question Number : 13 Question Id : 630680279764 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Identify the option that arranges the following minerals in increasing order of their relative hardness based on Mohs' scale.

A. Gypsum; B. Talc; C. Topaz; D. Corundum

**Options :**

1. ✘ D-C-B-A

2. ✘ A-B-C-D

3. ✘ B-C-A-D

4. ✔ B-A-C-D

**Question Number : 14 Question Id : 630680279765 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Identify the option that arranges the following river erosion processes for a valley in chronological sequence.

A. Valley deepening; B. Valley widening; C. Origin; D. Lengthening of valley

**Options :**

1. ✘ C-D-A-B

2. ✘ C-B-A-D

3. ✔ C-A-D-B

4. ✘ B-C-A-D

**Question Number : 15 Question Id : 630680279766 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which type of igneous rock is found at the highest depth from earth surface?

**Options :**

1. ✘ Volcanic rock

2. ✔ Plutonic rock

3. ✘ Hypabyssal rock

4. ✘ Clastic rock

**Question Number : 16 Question Id : 630680279767 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is NOT an agent of metamorphism in geological rocks?

**Options :**

1. ✘ Temperature

2. ✘ Pressure

3. ✘ Chemically active fluids

4. ✔ Extreme winds

**Question Number : 17 Question Id : 630680279768 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Granite rock found on earth is an example of:

**Options :**

1. ✘ Sedimentary rocks

2. ✘ Volcanic igneous rocks

3. ✔ Plutonic igneous rocks

4. ✘ Metamorphic rocks

**Question Number : 18 Question Id : 630680279769 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following options is best suited regarding the directive texture of an igneous rock in geological study?

**Options :**

1. ✘ Majority of constituent crystals have equal size.
2. ✘ Majority of constituent minerals have unequal relative size.
3. ✘ Polygonal or trigonal spaces are left blank between crystals.
4. ✔ It has crystals resulted along the flow of magma.

**Question Number : 19 Question Id : 630680279770 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Under the study of structural geology, an exposure of solid rock on the surface of earth is referred to as:

**Options :**

1. ✔ outcrop
2. ✘ outrock
3. ✘ bedding
4. ✘ plunge

**Question Number : 20 Question Id : 630680279771 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

The two quantities used to represent the attitude of a rock in structural geology are known as \_\_\_\_\_ and \_\_\_\_\_, respectively.

**Options :**

1. ✘ fold, fault
2. ✔ dip, strike
3. ✘ dip, slip
4. ✘ bedding, lamination

**Question Number : 21 Question Id : 630680279772 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the given option is correct regarding movement of faults under structural geology?

**Options :**

1. ✘ Horst has normal fault movement and Graben has reverse fault movement.
2. ✘ Horst has reverse fault movement and Graben has normal fault movement.
3. ✘ Both Horst and Graben has reverse fault movement.
4. ✔ Both Horst and Graben has normal fault movement.

**Question Number : 22 Question Id : 630680279773 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are correct regarding the classification of folds under structural geology?

1. Anticline folds have convex shape upward.
2. Syncline folds have convex downward shape.

**Options :**

1. ✔ Both statements 1 and 2 are correct
2. ✘ Both statements 1 and 2 are incorrect
3. ✘ Only statement 1 is correct
4. ✘ Only statement 2 is correct

**Question Number : 23 Question Id : 630680279774 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

While considering following two statements about stratigraphy of India, which of the statements are true?

1. The basin of Cuddapah system is found in Andhra Pradesh.
2. The basin of Cuddapah is found in Karnataka.

Choose correct statement (s) out of given option?

**Options :**

1. ✘ Both statements 1 and 2 correct
2. ✘ Both statements 1 and 2 incorrect
3. ✔ Only statement 1 correct

4. ✖ Only statement 2 correct

**Question Number : 24 Question Id : 630680279775 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are correct regarding metamorphic changes of rocks under geology?

1. Metamorphic change occurs only in igneous rocks.
2. Both igneous and sedimentary rocks may have metamorphic change.
3. Metamorphism causes granulation in rocks.

**Options :**

1. ✖ Only 1 and 2
2. ✔ Only 2 and 3
3. ✖ Only 1 and 3
4. ✖ All 1, 2 and 3

**Question Number : 25 Question Id : 630680279776 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are correct regarding folds under structural geology?

1. Class 1 folds have less degree of curvature in outer arc as compared to inner arc.
2. Class 2 folds have more degree of curvature in outer arc as compared to inner arc.
3. Class 3 folds have equal degree of curvature in both outer arc and inner arc.

**Options :**

1. ✔ Only 1
2. ✖ Only 2 and 3
3. ✖ Only 1 and 2
4. ✖ All 1, 2 and 3

**Question Number : 26 Question Id : 630680279777 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Match the names of the following rocks before and after their metamorphic change of form under petrology.

Before metamorphic change	After metamorphic change
A. Sandstone	1. Gneiss
B. Granite	2. Slate
C. Limestone	3. Quartzite
D. Shale	4. Marble

**Options :**

1. ✖ A-4; B-3; C-2; D-1
2. ✔ A-3, B-1, C-4, D-2
3. ✖ A-2, B-1, C-4, D-3
4. ✖ A-1, B-3, C-4, D-2

**Question Number : 27 Question Id : 630680279778 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Match the following pairs of rocks and their classification based on their origin under petrology.

Name of Rock	Classification
A. Coal	Igneous
B. Basalt	Igneous
C. Graphite	Metamorphic
D. Limestone	Sedimentary

**Options :**

1. ✖ A, B and C
2. ✖ Only C and D
3. ✔ B, C and D

4. ✘ Only A and C

**Question Number : 28 Question Id : 630680279779 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Identify the option that arranges the following mountain ranges in ascending order starting from north to south.  
A. Zaskar; B. Shiwalik; C. Karakoram; D. Arawali

**Options :**

1. ✘ A-D-C-B
2. ✘ A-C-B-D
3. ✘ C-B-A-D
4. ✔ C-A-B-D

**Question Number : 29 Question Id : 630680279780 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Identify the option that arranges the given period in chronological order as per Standard Geological time scale.  
A. Jurassic; B. Triassic; C. Cambrian; D. Tertiary

**Options :**

1. ✘ A-C-B-D
2. ✔ C-B-A-D
3. ✘ C-A-B-D
4. ✘ D-C-B-A

**Question Number : 30 Question Id : 630680279781 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

The instrument used in groundwater geophysics with high frequency electromagnetic survey is called:

**Options :**

1. ✔ ground penetrating radar
2. ✘ ground conductivity meters
3. ✘ ground conductivity radar
4. ✘ electromagnetic tracer

**Question Number : 31 Question Id : 630680279782 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Considering groundwater geophysical investigation under resistivity method of 'Wenner configurations', which of the following is a correct relationship between apparent resistivity ( $\rho$ ), potential difference ( $\Delta V$ ), current ( $I$ ) and space constant between electrode ( $a$ )?

**Options :**

1. ✘  $\rho = 4\pi a \frac{\Delta V}{I}$
2. ✘  $\rho = 2\pi a^2 \frac{\Delta V}{I}$
3. ✔  $\rho = 2\pi a \frac{\Delta V}{I}$
4. ✘  $\rho = 2\pi a \Delta V \times I$

**Question Number : 32 Question Id : 630680279783 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following rocks will offer the highest resistance to electric current under the electrical resistivity method of geophysical investigation?

**Options :**

1. ✘ Loose rocks
2. ✔ Dry compact rocks
3. ✘ Wet rocks
4. ✘ Porous rocks

**Question Number : 33 Question Id : 630680279784 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following waves is the fastest in subsurface geophysical investigation?

**Options :**

1. ✔ P-wave
2. ✘ S-wave
3. ✘ L-wave
4. ✘ Rayleigh wave

**Question Number : 34 Question Id : 630680279785 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following waves is recored at first after travelling through the ground to a considerable depth?

**Options :**

1. ✘ Transverse wave
2. ✔ Compressional wave
3. ✘ Surface wave
4. ✘ Rayleigh waves

**Question Number : 35 Question Id : 630680279786 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

P-waves in seismic method of geophysical investigation is pramarily used for:

**Options :**

1. ✘ consolidated rock formation
2. ✘ unconsolidated rock formation
3. ✘ identification of apparent resistivity
4. ✔ identification of aquifer

**Question Number : 36 Question Id : 630680279787 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following frequency is suitable for geophysical investigation using Electromagnetic Waves? (MHz- Mega Hertz)

**Options :**

1. ✘ 10 MHz
2. ✘ 50 MHz
3. ✘ 75 MHz
4. ✔ 150 MHz

**Question Number : 37 Question Id : 630680279788 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are correct in the context of seismic methods of geophysical investigation?

- A. Seismic wave travels faster in denser and elastic rocks.
- B. Seismic methods are based on the velocity of elastic waves.

**Options :**

1. ✘ Only A
2. ✘ Only B



3. ✓ Both A and B  
4. ✗ Neither A nor B

**Question Number : 38 Question Id : 630680279789 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are correct in the context of survey in seismic method of geophysical investigation?

- A. Refraction survey uses geophones for velocity recording.  
B. Reflected survey uses geophones for velocity recording.

**Options :**

1. ✓ Only A  
2. ✗ Only B  
3. ✗ Both A and B  
4. ✗ Neither A nor B

**Question Number : 39 Question Id : 630680279790 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statements are correct with reference to seismic method of geophysical investigation?

- A. The velocity of seismic waves reduces when they encounter saturated rock formation.  
B. The velocity of seismic waves reduces when they encounter poorly consolidated rock formation.  
C. The velocity of seismic waves increases when they encounter unconsolidated rock formation.  
D. The velocity of seismic waves reduces when they encounter unconsolidated rock formation.

**Options :**

1. ✗ A, B and C  
2. ✗ Only B and C  
3. ✓ A, B and D  
4. ✗ B, C and D

**Question Number : 40 Question Id : 630680279791 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statements are correct with reference to resistivity methods, which is widely used in geological investigation?

- A. The resistivity method can be used for determining the depth of bedrock.  
B. The resistivity method can be used for determining the location of geological structures.  
C. The resistivity method can be used for determining the location of aquifer.  
D. The resistivity method can be used for delineation of large depth.

**Options :**

1. ✓ A, B and C  
2. ✗ Only B and C  
3. ✗ A, B and D  
4. ✗ B, C and D

**Question Number : 41 Question Id : 630680279792 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Match the following.

Type of rock	Velocity of P waves (km/sec)
(I) Granite	(a) 3.5-6.8
(II) Marble	(b) 5.5-6.1
(III) Limestone	(c) 2.5-7.0

**Options :**

1. ✗ (I)-(a), (II)-(b), (III)-(c)  
2. ✗ (I)-(c), (II)-(b), (III)-(a)  
3. ✓ (I)-(b), (II)-(a), (III)-(c)

4. ✘ (I)-(a), (II)-(c), (III)-(b)

**Question Number : 42 Question Id : 630680279793 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following pairs are correct in the context of groundwater investigation using gravity method?

- A. Gravimeters : Direct measurement of the value of gravity.
- B. Gal : Unit of gravity
- C. Free air correction : Always negative
- D. Isogams : Lines passing through points of same gravity anomaly

**Options :**

- 1. ✘ Only A and B
- 2. ✘ Only A, B and C
- 3. ✘ Only B, C and D
- 4. ✔ Only A, B and D

**Question Number : 43 Question Id : 630680279794 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Identify the option that arranges the following fundamental procedures in all seismic investigation methods of subsurface exploration in ascending order.

- (I) A shock is created at a chosen point
- (II) The wave is recorded at some distance using geophones
- (III) Time-distance plots are prepared
- (IV) The presence of high or low velocity media is determined

**Options :**

- 1. ✔ (I)-(II)-(III)-(IV)
- 2. ✘ (I)-(III)-(II)-(IV)
- 3. ✘ (II)-(I)-(IV)-(III)
- 4. ✘ (II)-(I)-(III)-(IV)

**Question Number : 44 Question Id : 630680279795 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following options is in correct chronological order of seismic waves arrival on the surface of earth while studying the depth of subsurface exploration.

**Options :**

- 1. ✔ P - wave, S - wave, Surface wave
- 2. ✘ P - wave, Surface wave, S - wave
- 3. ✘ Surface wave, S - wave, P - wave
- 4. ✘ Surface wave, P - wave, S - wave

**Question Number : 45 Question Id : 630680279796 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is NOT included as physical water quality parameter?

**Options :**

- 1. ✘ Turbidity
- 2. ✘ Colour
- 3. ✘ Taste
- 4. ✔ Hardness

**Question Number : 46 Question Id : 630680279797 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Chlorides are generally present in water around marine sources in the form of:

**Options :**

- 1. ✔ sodium chloride
- 2. ✘ calcium chloride
- 3. ✘ magnesium chloride

4. ✘ potassium chloride

**Question Number : 47 Question Id : 630680279798 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Regarding chemical properties of water, the carbonate hardness is equal to:

**Options :**

1. ✘ alkanity
2. ✘ total hardness
3. ✔ minimum of alkanity and total hardness
4. ✘ maximum of alkanity and total hardness

**Question Number : 48 Question Id : 630680279799 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

While discussing water contamination, bacteria are reproduced by binary fission and may be of various shapes. Which of the following is spherical shaped bacteria?

**Options :**

1. ✘ Vibrio
2. ✔ Cocci
3. ✘ Bacilli
4. ✘ Spirilla

**Question Number : 49 Question Id : 630680279800 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

If total hardness of water is 40 mg/l and alkalinity is 50 mg/l, then the value of non carbonate hardness in mg/l is:

**Options :**

1. ✔ 0
2. ✘ 10
3. ✘ 90
4. ✘ 40

**Question Number : 50 Question Id : 630680279801 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

During water treatment, it is found that the pH values of incoming and outgoing water are 6 and 8, respectively. Determine the average value of pH of water. Given that there is a linear relation between pH and time and  $\log(10/50.5) = (-0.7)$ .

**Options :**

1. ✔ 6.3
2. ✘ 7.7
3. ✘ 6.7
4. ✘ 7

**Question Number : 51 Question Id : 630680279802 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are correct?

- A. pH is mathematically given as  $\log[H^+]$   
B. pH is mathematically given as  $\log[OH^-]$

**Options :**

1. ✘ Only A
2. ✘ Only B
3. ✘ Both A and B
4. ✔ Neither A nor B

**Question Number : 52 Question Id : 630680279803 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is correct considering physical properties of water?

- A. The unit of specific conductivity is mho-cm.
- B. Tintometer is used to measure the taste of water.

**Options :**

- 1. ✖ Only A
- 2. ✖ Only B
- 3. ✖ Both A and B
- 4. ✔ Neither A nor B

**Question Number : 53 Question Id : 630680279804 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is correct considering water contamination?

- A. The sum total of ammonia, nitrogen and the organic nitrogen is called Kjeldahl nitrogen.
- B. Non-pathogenic bacteria are more harmful than pathogenic bacteria.
- C. Facultative bacteria are those which cannot survive without free oxygen.
- D. Aerobic bacteria are those which require oxygen for their survival.

**Options :**

- 1. ✖ Only A, B and C
- 2. ✔ Only A and D
- 3. ✖ All A, B, C and D
- 4. ✖ Only B, C and D

**Question Number : 54 Question Id : 630680279805 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Identify the correctly matched pair(s) of physical and chemical properties of water with their measuring instruments or parameter.

- A. Taste and odours : Tintometer
- B. Turbidity : FTU
- C. Colour : Threshold number
- D. pH :  $-\log[\text{OH}^-]$

**Options :**

- 1. ✖ Only B and D
- 2. ✔ Only B
- 3. ✖ Only A, B and D
- 4. ✖ All A, B, C and D

**Question Number : 55 Question Id : 630680279806 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Identify the option that arranges the permissible values (in ppm) of concentration of following parameters in municipal or industrial water in increasing order. (ppm- part per million)

- A. Hardness of soft water
- B. Hardness of moderate water
- C. Hardness of hard water
- D. Chloride content

**Options :**

- 1. ✔ A, B, C, D
- 2. ✖ D, A, B, C
- 3. ✖ C, B, A, D
- 4. ✖ D, C, B, A

**Question Number : 56 Question Id : 630680279807 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Considering stage of decomposition of organic matter in municipal or industrial water, identify the option that arranges the following in chronological order (first to last).

- A. Free ammonia
- B. Albuminoid Nitrogen
- C. Nitrates
- D. Nitrites

**Options :**

1. ✓ B, A, D, C
2. ✗ B, C, D, A
3. ✗ A, B, C, D
4. ✗ A, B, D, C

**Question Number : 57 Question Id : 630680279808 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is an agricultural source of ground water pollution?

**Options :**

1. ✓ Animal waste
2. ✗ Tank and pipeline leakage
3. ✗ Mining activity
4. ✗ Oil-field brines

**Question Number : 58 Question Id : 630680279809 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following water borne diseases is caused by viral infections?

**Options :**

1. ✗ Cholera
2. ✗ Bascillary dysentery
3. ✗ Typhoid fever
4. ✓ Poliomyelitis

**Question Number : 59 Question Id : 630680279810 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

As per World Health Organisation's modified guidelines 1993, the allowable limit of number of coliform organisms per 100 ml in un piped water supplies is:

**Options :**

1. ✗ 0
2. ✗ 3
3. ✓ 10
4. ✗ 5

**Question Number : 60 Question Id : 630680279811 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

As per IS 10500 : 1991, the desirable limit of total hardness (as  $\text{CaCO}_3$ ) in mg/l is:

**Options :**

1. ✗ 500
2. ✓ 300
3. ✗ 250
4. ✗ 600

**Question Number : 61 Question Id : 630680279812 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

With reference to water quality parameters, which form of arsenic is soluble in water under aerobic conditions?

**Options :**

1. ✗ Organic arsenic
2. ✗ Inorganic arsenic
3. ✗ Trivalent arsenite
4. ✓ Pentavalent arsenate

**Question Number : 62 Question Id : 630680279813 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Considering Keratosis, which is a stage of arsenicosis, which of the following is true?

**Options :**

1. ✘ It is the initial stage of arsenicosis
2. ✔ It is the final stage of arsenicosis
3. ✘ It is the middle stage of arsenicosis
4. ✘ Skin becomes soft and fibrous

**Question Number : 63 Question Id : 630680279814 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are correct in context of WHO's standard guidelines(1993) for potable water?

- A. As per World Health Organisation, the amount of Arsenic in mg/l is 0.005.
- B. As per World Health Organisation, the amount of Lead in mg/l is 0.001.

**Options :**

1. ✘ Only A
2. ✘ Only B
3. ✘ Both A and B
4. ✔ Neither A nor B

**Question Number : 64 Question Id : 630680279815 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are correct regarding ground water pollution in environmental hydrology?

- A. Fertiliser is an industrial source of ground water pollution.
- B. Sewer is a municipal source of ground water pollution.

**Options :**

1. ✘ Only A
2. ✔ Only B
3. ✘ Both A and B
4. ✘ Neither A nor B

**Question Number : 65 Question Id : 630680279816 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are correct with reference to ground water contamination?

- A. Arsenic is non poisonous for human.
- B. Very low concentration of arsenic can be tolerated by human system.
- C. Fluoride concentration greater than 1.5 ppm is harmful.
- D. Fluoride concentration less than 0.8-1.0 ppm may be harmful and may cause dental caries.

**Options :**

1. ✘ Only A, B and C
2. ✘ Only B and C
3. ✘ A, B, C and D
4. ✔ Only B, C and D

**Question Number : 66 Question Id : 630680279817 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Match the following as per WHO's standard guidelines for potable water (1993).

Water Quality parameter	Permissible limit
A. Antimony	1) 0.01 mg/l
B. Lead	2) 0.005 mg/l
C. Mercury	3) 0.001 mg/l
D. Nickel	4) 0.07 mg/l
	5) 0.02 mg/l

Options :

1. ✓ A-2; B-1; C-3; D-5
2. ✗ A-1; B-2; C-3; D-4
3. ✗ A-1; B-2; C-4; D-5
4. ✗ A-2; B-1; C-4; D-3

Question Number : 67 Question Id : 630680279818 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Identify the option that arranges the concentration of following inorganic constituents as per WHO's standard guidelines for potable water (1993) in decreasing order of permissible limit in mg/l.

- A. Fluoride
- B. Boron
- C. Barium
- D. Antimony
- E. Arsenic

Options :

1. ✗ C, B, A, D, E
2. ✗ B, A, C, E, D
3. ✓ A, C, B, E, D
4. ✗ C, B, D, A, E

Question Number : 68 Question Id : 630680279819 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Identify the option that arranges the following processes of green house effect in chronological order.

- A. Increase in CO<sub>2</sub> content in environment
- B. Large Scale deforestation
- C. Arrival and reproduction of man
- D. Green house effect
- E. Gradual heating up of the earth

Options :

1. ✓ C, B, A, D, E
2. ✗ B, A, C, E, D
3. ✗ D, C, B, A, E
4. ✗ C, B, D, A, E

Question Number : 69 Question Id : 630680279820 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

In hydrological cycle, the precipitation on an impermeable surface of a bare land is expressed by \_\_\_\_\_?

Options :

1. ✓ Evaporation + Run off
2. ✗ Evaporation - Run off
3. ✗ Sub-surface runoff + base flow
4. ✗ Infiltration + Run off

Question Number : 70 Question Id : 630680279821 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following relations is suitable for lake evaporation and pan evaporation under hydrological study?

**Options :**

1. ✘ Lake evaporation = Pan diameter × pan evaporation
2. ✔ Lake evaporation = Pan coefficient × pan evaporation
3. ✘ Lake evaporation = Pan evaporation / pan coefficient
4. ✘ Lake evaporation = Pan coefficient x pan diameter × pan evaporation

**Question Number : 71 Question Id : 630680279822 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

While studying hydrology, Evapotranspiration is defined as:

**Options :**

1. ✘ the total loss of water through infiltration and evaporation from plant
2. ✘ the total loss of water through percolation and evaporation from plant
3. ✘ the total loss of water through runoff and evaporation from plant
4. ✔ the total loss of water through evaporation and transpiration from plant

**Question Number : 72 Question Id : 630680279823 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following options is the largest source of freshwater as per the world's global water balance study?

**Options :**

1. ✘ Rivers
2. ✔ Glaciers and Ice caps
3. ✘ Oceans
4. ✘ Wetlands

**Question Number : 73 Question Id : 630680279824 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following options is correct representation of relation of the infiltration capacity with drainage density and runoff rate under hydrological cycle?

**Options :**

1. ✔ Infiltration capacity decreases with increase in both drainage density and runoff rate
2. ✘ Infiltration capacity decreases with decrease in drainage density and increase in runoff rate
3. ✘ Infiltration capacity increases with decrease in drainage density and increase in runoff rate
4. ✘ Infiltration capacity increases with increase in both drainage density and runoff rate

**Question Number : 74 Question Id : 630680279825 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

In case of severe floods, the maximum amount of rainfall can be studied by considering DAD analysis. What actually DAD stands for?

**Options :**

1. ✘ Discharge-area-duration
2. ✘ Depth-area-discharge
3. ✔ Depth-area-duration
4. ✘ Discharge-area-depth

**Question Number : 75 Question Id : 630680279826 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are correct?

- (I) Infiltration reduces the magnitude of flood.  
 (II) Infiltration recharges the ground water reservoir.

**Options :**

1. ✘ Only (I)
2. ✘ Only (II)
3. ✔ Both (I) and (II)
4. ✘ Neither (I) nor (II)



**Question Number : 76 Question Id : 630680279827 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Read the following statements:

(I) Probable maximum precipitation (PMP) is independent of the humidity and temperature parameters.

(II) Probable maximum precipitation (PMP) can be estimated by maximizing the wind velocity and other meteorological factors.

Which of the above statement(s) is(are) correct?

**Options :**

1. ✘ Only (I)
2. ✔ Only (II)
3. ✘ Both (I) & (II)
4. ✘ Neither (I) nor (II)

**Question Number : 77 Question Id : 630680279828 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are correct?

(I) Snow and rainfall are the examples of liquid precipitation.

(II) Transpiration is referred to as evaporation from plants and leaves.

(III) Run off is the evaporated portion of precipitation.

(IV) Wind speed is measured by anemometer and wind direction can be measured by wind vane.

**Options :**

1. ✘ Only (I) and (III)
2. ✔ Only (II) and (IV)
3. ✘ (I), (II) and (III)
4. ✘ (II), (III) and (IV)

**Question Number : 78 Question Id : 630680279829 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following options is the correct match of the following?

Parameters	Unit
(I) Infiltration capacity	(a) m <sup>3</sup> /(sq. km)
(II) Runoff rate	(b) cm/hr
(III) rainfall	(c) cm

**Options :**

1. ✘ (I)-(a), (II)-(b), (III)-(c)
2. ✘ (I)-(c), (II)-(b), (III)-(a)
3. ✔ (I)-(b), (II)-(a), (III)-(c)
4. ✘ (I)-(a), (II)-(c), (III)-(b)

**Question Number : 79 Question Id : 630680279830 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Select the option that is correctly paired.

A. Tipping bucket type : Recording raingauge

B. Symons type : Non-recording raingauge

C. Infiltration rate : Evaporation pan

D. Evapotranspiration : Lysimeters

**Options :**

1. ✘ Only A and B
2. ✘ A, B and C
3. ✘ B, C and D
4. ✔ A, B and D

**Question Number : 80 Question Id : 630680279831 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following options is correctly arranged in increasing order of processes under hydrological cycle?

**Options :**

1. ✘ Precipitation, Condensation, Percolation, infiltration, Evaporation
2. ✔ Condensation, Precipitation, Infiltration, Percolation, Evaporation
3. ✘ Infiltration, Precipitation Condensation, Percolation, Evaporation
4. ✘ Evaporation, Precipitation, Infiltration, Condensation, Percolation

**Question Number : 81 Question Id : 630680279832 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Identify the option that arranges the following monsoon period of India in chronological order.

- (I) Monsoon period
- (II) Post monsoon period
- (III) Winter rainfall period
- (IV) Summer rainfall period

**Options :**

1. ✔ (I)-(II)-(III)-(IV)
2. ✘ (I)-(III)-(IV)-(II)
3. ✘ (I)-(II)-(IV)-(III)
4. ✘ (II)-(I)-(III)-(IV)

**Question Number : 82 Question Id : 630680279833 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which option is a suitable condition for groundwater runoff under hydrology?

**Options :**

1. ✘ Impermeable surface soil
2. ✘ Permeable surface soil and impermeable sub-soil
3. ✘ Impermeable surface soil and permeable sub-soil
4. ✔ Permeable surface soil and permeable sub-soil

**Question Number : 83 Question Id : 630680279834 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is a part of direct runoff under hydrological study?

**Options :**

1. ✘ Evaporation
2. ✘ Basin recharge
3. ✘ Percolation
4. ✔ Overland flow

**Question Number : 84 Question Id : 630680279835 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Regarding runoff hydrograph in hydrology, which of the following is a physiographic factor?

**Options :**

1. ✘ Magnitude and movement of storm
2. ✘ Evapotranspiration
3. ✘ Initial loss
4. ✔ Nature of the valley

**Question Number : 85 Question Id : 630680279836 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Considering unit hydrograph in hydrology, it has a unit of which of the following?

**Options :**

1. ✘ Peak discharge
2. ✘ Rainfall duration
3. ✔ Excess rainfall depth
4. ✘ The time base of direct runoff

**Question Number : 86 Question Id : 630680279837 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Considering unit hydrograph in hydrology, which of the following options is the basic assumption of it?

**Options :**

1. ✘ Nonlinear response and time invariance
2. ✔ Time invariance and linear response
3. ✘ Linear response and linear time variance
4. ✘ Nonlinear time variance and linear response

**Question Number : 87 Question Id : 630680279838 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is NOT an essential component of a hydrograph in hydrology?

**Options :**

1. ✘ The rising limb
2. ✔ Toe segment
3. ✘ Concentration curve
4. ✘ Recession limb

**Question Number : 88 Question Id : 630680279839 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Direct runoff under hydrology includes:

- A. Overland flow or surface runoff
- B. Sub-surface runoff or interflow

**Options :**

1. ✘ Only A
2. ✘ Only B
3. ✔ Both A and B
4. ✘ Neither A nor B

**Question Number : 89 Question Id : 630680279840 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are correct regarding essential condition for sub-surface runoff under hydrology?

- A. Surface soil should be permeable.
- B. Sub-soil is relatively impermeable

**Options :**

1. ✘ Only A
2. ✘ Only B
3. ✔ Both A and B
4. ✘ Neither A nor B

**Question Number : 90 Question Id : 630680279841 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following are the principal factors affecting the runoff flow across a catchment area in terms of hydrology?

- A. Shape and size of catchment
- B. Characteristics of the catchment surface
- C. Precipitation characteristics
- D. Availability of rain gauge

**Options :**

1. ✔ Only A, B and C

2. ✖ Only B and C
3. ✖ A, B, C and D
4. ✖ Only B, C and D

**Question Number : 91 Question Id : 630680279842 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statements are correct regarding hydrographs under hydrology?

- A. Precipitation is considered as infiltration characteristics which affects runoff hydrograph.
- B. Drainage density is a basin characteristics and it affects runoff hydrograph.
- C. Recession limb of a hydrograph is independent of storm characteristics.
- D. Peak flow in a hydrograph is visible in its recession limb.

**Options :**

1. ✖ Only A, B and C
2. ✔ Only B and C
3. ✖ A, B, C and D
4. ✖ Only B, C and D

**Question Number : 92 Question Id : 630680279843 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Match the following terms and their meanings as referred from hydrology.

Hydrologic parameter	Meaning
A. Stream density	1. That portion of water which flows over the land surface divided by catchment area
B. Form factor	2. Number of streams of given order per sq. km of catchment area
C. Drainage density	3. Ratio of watershed area to the square of its length
D. Centroid of basin	4. Total length of all streams of the catchment divided by its area
	5. Point of weighted centre of a watershed

**Options :**

1. ✖ A-1; B-2; C-3; D-4
2. ✖ A-1; B-2; C-4; D-5
3. ✖ A-2; B-1; C-3; D-5
4. ✔ A-2; B-3; C-4; D-5

**Question Number : 93 Question Id : 630680279844 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following combinations with respect to runoff under hydrology is correctly paired?

Parameter : Scientist

- A. Elongation ratio : Miller
- B. Cicularatory Ratio : Schuman
- C. Compactnesscoefficient : Strahler
- D. Form factor : Horton

**Options :**

1. ✖ Only A and D
2. ✔ Only C and D
3. ✖ Only A, C and D
4. ✖ A, B, C and D

**Question Number : 94 Question Id : 630680279845 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Identify the option that arranges the following steps for computation of direct runoff from a storm hydrograph in chronological order.

- A. Determination of base flow ordinates at given time intervals.
- B. Determination of ordinates of direct runoff at given time intervals.

- C. Determination of ordinates of storm hydrograph at given time intervals.  
D. Estimation of direct runoff depth.

**Options :**

1. ✘ C-A-D-B
2. ✘ A-B-C-D
3. ✔ C-A-B-D
4. ✘ B-A-C-D

**Question Number : 95 Question Id : 630680279846 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Massive quartzite rock is an example of which of the following geological water bearing formations?

**Options :**

1. ✘ Aquifer
2. ✔ Aquifuge
3. ✘ Aquiclude
4. ✘ Aquitard

**Question Number : 96 Question Id : 630680279847 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statements are TRUE regarding Aquiclude (a type of geological water bearing formation)?

**Statements:**

- 1) A saturated formation through which virtually no water is transmitted.
- 2) It may have low porosity but relatively have very high permeability and hence do yield appreciable quantities of water to wells.
- 3) Clay and shale are the examples of aquiclude.

**Options :**

1. ✘ Only 1
2. ✘ Both 1 and 2
3. ✔ Both 1 and 3
4. ✘ Only 3

**Question Number : 97 Question Id : 630680279848 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement regarding the difference between the saturated and the unsaturated zones of groundwater is CORRECT?

**Options :**

1. ✔ The pore spaces in the saturated zone are completely full of water; while the pore spaces in the unsaturated zone are not completely full of water
2. ✘ The pore spaces in the saturated zone are not completely full of water; while the pore spaces in the unsaturated zone are completely full of water
3. ✘ The saturated zone has a higher porosity than the unsaturated zone
4. ✘ The saturated zone has a lower porosity than the unsaturated zone

**Question Number : 98 Question Id : 630680279849 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement(s) is/are true regarding the Zone of aeration while referring groundwater?

**Statement 1 :** The area above the water table that includes the capillary fringe and the zone of soil moisture is called the unsaturated zone or zone of aeration.

**Statement 2 :** Although a considerable amount of water can be present in the unsaturated zone, this water cannot be pumped by wells because it clings too tightly to rock and soil particles and percolates slowly through the openings, this water is called vadose water.

**Options :**

1. ✘ Statement 1 is true and Statement 2 is false
2. ✘ Statement 1 is false and Statement 2 is true
3. ✔ Both Statements are true
4. ✘ Both Statements are false

**Question Number : 99 Question Id : 630680279850 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is the correct expression for effective porosity ( $n_e$ )?

**Options :**

1. ✘  $n_e = \frac{\text{Total volume}}{\text{Volume of interconnected voids}}$

2. ✔  $n_e = \frac{\text{Volume of interconnected voids}}{\text{Total Volume}}$

3. ✘  $n_e = \frac{\text{Volume of disconnected voids}}{\text{Total volume}}$

4. ✘  $n_e = \frac{\text{Total volume}}{\text{Volume of disconnected voids}}$

**Question Number : 100 Question Id : 630680279851 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

If  $1 \text{ m}^3$  of sand contains  $0.3 \text{ m}^3$  of open spaces (or) pores, its porosity is given as:

**Options :**

1. ✘ 20%

2. ✘ 25%

3. ✔ 30%

4. ✘ 35%

**Question Number : 101 Question Id : 630680279852 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Identify the INCORRECT pair (rock type and range of permeability(m/day)) from the following?

**Options :**

1. ✘ Fine to medium sand -> 5-30

2. ✔ Gravel ->20 -70

3. ✘ Fine sand ->  $10^{-1}$ -10

4. ✘ Sand clay ->  $10^{-3}$ -1

**Question Number : 102 Question Id : 630680279853 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Transmissivity, which is a property of aquifer under water bearing formation, is defined as:

**Options :**

1. ✔ Product of the hydraulic conductivity and the saturated thickness of the aquifer

2. ✘ Sum of the hydraulic conductivity and the saturated thickness of the aquifer

3. ✘ Difference between the hydraulic conductivity and the saturated thickness of the aquifer

4. ✘ Ratio of the hydraulic conductivity to the saturated thickness of the aquifer

**Question Number : 103 Question Id : 630680279854 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

According to Darcy's law of permeability, the rate of flow of groundwater through a column of saturated sand is:

**Options :**

- ✘ Indirectly proportional to the difference in hydraulic head at the ends of the column
- ✔ Directly proportional to the difference in hydraulic head at the ends of the column
- ✘ Directly proportional to the length of the column
- ✘ zero

**Question Number : 104 Question Id : 630680279855 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

The top of the water saturated zone under the study of groundwater is known as:

**Options :**

- ✔ Water table
- ✘ Aquitard
- ✘ Aquifer
- ✘ Hydraulic head

**Question Number : 105 Question Id : 630680279856 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Ground water under hydrology is defined as:

**Options :**

- ✘ All that water which occurs below the surface of the ground
- ✘ All that water which occurs above the water table
- ✘ All that water which occurs in the pores of the soils and rocks below the surface of the ground
- ✔ All that water which occurs below the water table in the pores and openings of rocks which are fully saturated with it

**Question Number : 106 Question Id : 630680279857 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Choose the suitable option regarding following statements with respect to the secular variations/fluctuations of groundwater level under hydrology:

**Statement 1:** secular variations in ground water level extending over a period of years, alternating seasons of wet and dry years is which the rainfall in above and below the mean respectively, produce long period fluctuation of level

**Statement 2:** Recharge is the governing factor for such fluctuations.

**Options :**

- ✘ Statement 1 is true and Statement 2 is false
- ✘ Statement 1 is false and Statement 2 is true
- ✔ Both Statements are true
- ✘ Both Statements are false

**Question Number : 107 Question Id : 630680279858 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which type of wells is constructed by driving a small-diameter pipe into shallow water-bearing sand or gravel and usually a screened well point is attached to the bottom of the casing before driving?

**Options :**

- ✔ Driven wells
- ✘ Dug wells
- ✘ Bored wells
- ✘ Drilled wells

**Question Number : 108 Question Id : 630680279859 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

The process of injection of high-pressure air or water through the screens to remove fines and drilling fluids under the well development method is known as:

**Options :**

1. ✖ Surging
2. ✖ Hydro-fracturing
3. ✖ Air surging and pumping
4. ✔ Jetting

**Question Number : 109 Question Id : 630680279860 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

What is the correct sequence of steps of well rehabilitation in increasing order?

- 1) Determine the characteristics of the well
- 2) Notify all users of the well not to drink the water during the rehabilitation procedures and to store sufficient water for use during the period of rehabilitation
- 3) Remove all polluted water, sediments and debris
- 4) Remove the pumping mechanism or lifting device
- 5) Repair the damage

**Options :**

1. ✖ 2, 1, 3, 4, 5
2. ✖ 1, 2, 4, 3, 5
3. ✖ 1, 2, 3, 5, 4
4. ✔ 2, 1, 4, 3, 5

**Question Number : 110 Question Id : 630680279861 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is an example of active remote sensor technology?

**Options :**

1. ✖ Imaging radiometer
2. ✖ Spectrometer
3. ✖ Spectro-radiometer
4. ✔ Scatterometer

**Question Number : 111 Question Id : 630680279862 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statements regarding the two dimensional (2D) and three-dimensional (3D) geographical information system (GIS) systems are TRUE?

**Statements:**

1. The 2D systems are basically no more than a map visualisation tool with the capacity to overlay different types of zero-(point), one-(line) and two-(surface) dimensional information
2. 2D systems can only handle a projection on a surface of the subsurface boundaries and properties, similar to a map or cross section made by traditional drawing methods.
3. In 3D systems, the coordinate system in the database consists of three coordinates, x, y and z.

**Options :**

1. ✖ Only 2
2. ✖ Both 1 and 3
3. ✖ Both 1 and 2
4. ✔ All 1, 2 and 3

**Question Number : 112 Question Id : 630680279863 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Consider the following with regards to remote sensing system:

1. The sensor used for geologic investigations is active one
2. The sensor used for geologic investigations is passive one
3. The source is Sun

Of the above, the correct statement(s) is (are)?

**Options :**

1. ✖ Only 2



2. ✖ Both 2 and 3
3. ✖ Only 1 and 2
4. ✔ All 1, 2 and 3

**Question Number : 113 Question Id : 630680279864 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

While going through remote sensing and GIS, Electromagnetic energy striking the matter or object is called incident radiation, is of the following types:

1. Absorbed energy
2. Scattered energy
3. Transmitted energy

**Options :**

1. ✖ 1 and 3
2. ✖ 1 and 2
3. ✖ Only 1
4. ✔ 1, 2 and 3

**Question Number : 114 Question Id : 630680279865 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Out of the following options, which of the properties of incident radiation of an electromagnetic energy under remote sensing is likely to undergo a change after interaction with the matter?

**Options :**

1. ✖ Surface roughness
2. ✖ Density and viscosity
3. ✔ Direction, intensity, phase, polarization and wave length
4. ✖ Density and velocity

**Question Number : 115 Question Id : 630680279866 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

IRS 1A and 1B satellites under remote sensing can carry which of the following sensors?

**Options :**

1. ✖ LISS-V
2. ✖ LISS-IV
3. ✔ LISS-I
4. ✖ LISS-III

**Question Number : 116 Question Id : 630680279867 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which type of map projection under remote sensing and GIS has generally been accepted as the best for a small, regular shaped area, such as, the standard quadrangle and also used by Survey of India for making topographical maps of Scale 1 : 250,000 and more?

**Options :**

1. ✖ Oblique mercator
2. ✔ Polyconic projection
3. ✖ Mercator
4. ✖ Transverse mercator

**Question Number : 117 Question Id : 630680279868 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

While considering spectral reflectance curves under remote sensing and GIS for a sand grain with complex index of refraction  $N(\lambda) = n(\lambda)[1 - ik(\lambda)]$ , the specular reflectance is expressed by Fresnel's equation (Jenkins and White 1957), as follows:

$$r^s(\lambda) = \frac{[n(\lambda) - 1]^2 + n^2(\lambda)k^2(\lambda)}{[n(\lambda) + 1]^2 + n^2(\lambda)k^2(\lambda)} g(\theta, \phi)$$

Here  $n(\lambda)$  indicates,

**Options :**

1. ✖ specular reflectance of one reflecting grain
2. ✔ intrinsic spectral index of refraction of the grain
3. ✖ intrinsic spectral index of absorption of the grain
4. ✖ non zero function of the angle of incidence

**Question Number : 118 Question Id : 630680279869 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Consider the following with regards to Geosynchronous orbit:

1. The satellites in such orbits are synchronous with respect to the Earth. This means looking from a fixed point from earth, these satellites appear to be stationary.
2. In such orbit a satellite needs exactly about 24 hours to orbit around the earth; this is the same time that the earth takes to perform a complete revolution around its axis.
3. The inclination of geosynchronous satellite with respect to earth must be zero.
4. This orbit lies at an altitude between 700 to 800 Km above the Earth.

Of the above, the INCORRECT statement(s) is(are)?

**Options :**

1. ✔ Only 4
2. ✖ Only 3
3. ✖ Both 1 and 2
4. ✖ Both 2 and 3

**Question Number : 119 Question Id : 630680279870 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Match the following between sensors (IRS-1A, IRS-1C) and spatial resolution of those sensors under the study of Indian remote sensing satellites:

sensors	spatial resolution(m)
1. LISS-1	a. 73
2. LISS-2	b. 23.5
3. LISS-3	c. 36.25

**Options :**

1. ✖ 1-a, 2-b, 3-c
2. ✔ 1-a, 2-c, 3-b
3. ✖ 1-b, 2-a, 3-c
4. ✖ 1-c, 2-b, 3-a

**Question Number : 120 Question Id : 630680279871 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statements is NOT a demerit of supervised method of image classification under satellite remote sensing?

**Options :**

1. ✘ Analyst imposes a structure on data, which may not match reality
2. ✘ Training data selected by the analyst may not be representative of conditions present throughout the image
3. ✔ Able to recognise and represent special or unique categories not represented in the training data
4. ✘ Training classes are generally based on field identification and not on spectral properties hence spectral signatures are forced

**Question Number : 121 Question Id : 630680279872 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Arrange the steps involved in supervised method of image classification under satellite remote sensing in ascending order of sequence:

1. Informational class mapping
2. Computation of certain properties such as mean, variance, covariance etc. by classification algorithm
3. Classification of all pixels
4. Identification or selection of training area for each informational class by an analyst

**Options :**

1. ✘ 1-2-3-4
2. ✘ 2-1-3-4
3. ✔ 4-2-3-1
4. ✘ 1-4-3-2

**Question Number : 122 Question Id : 630680279873 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following are the area(s) of applications of the Remote sensing under hydrology?

- a. Evapotranspiration over land surface
- b. Groundwater identification and estimation
- c. Snow hydrology applications
- d. Water quality modelling

**Options :**

1. ✘ Only b
2. ✘ Both a and b
3. ✘ Both c and a
4. ✔ a, b, c and d

**Question Number : 123 Question Id : 630680279874 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following is a secondary source/method of GIS (Geographical information systems) data?

**Options :**

1. ✔ Digitising Existing Maps / Charts
2. ✘ LiDAR
3. ✘ Meteorological Sensors
4. ✘ Photogrammetry

**Question Number : 124 Question Id : 630680279875 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Arrange the Stages of GIS (Geographical information system) Data Modelling in ascending order of sequence?

1. Identifying the spatial features from the real world that are of interest in the context of an application
2. Selecting an appropriate spatial data structure to store the model within the computer. The spatial data structure is the physical way in which entities are coded for the purpose of storage and manipulation
3. Representing the conceptual model by an appropriate spatial data model. This involves choosing between one of the two approaches: raster or vector

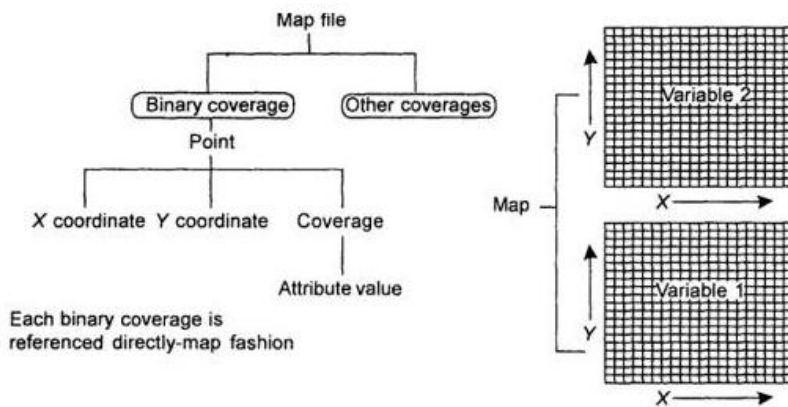
**Options :**

1. ✘ 1-2-3
2. ✔ 1-3-2
3. ✘ 2-3-1
4. ✘ 3-2-1

Question Number : 125 Question Id : 630680279876 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Identify the type of raster GIS (Geographical information system) model shown in the given figure.



Options :

1. ✘ GRID model
2. ✘ LUNAR model
3. ✔ IMGRID model
4. ✘ MAP model

Question Number : 126 Question Id : 630680279877 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following application of GIS (Geographical information system) in Environmental Management is INCORRECT?

Options :

1. ✘ Managing natural resources
2. ✘ Determining land use and land cover
3. ✔ Man made activities are not involved like cutting down trees
4. ✘ Identifying volcanic hazards

Question Number : 127 Question Id : 630680279878 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following is a commercial GIS (Geographical information system) software?

Options :

1. ✔ GRAM++ GIS
2. ✘ Chameleon
3. ✘ PostGIS
4. ✘ Quantum GIS

Question Number : 128 Question Id : 630680279879 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following is a physiographic characteristic of a watershed under hydrological study?

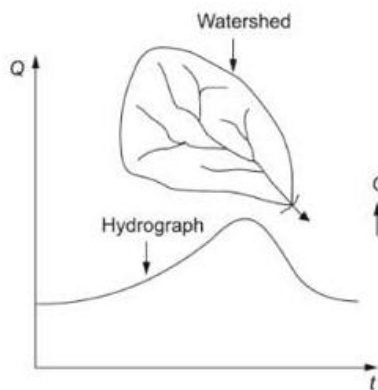
Options :

1. ✔ Vegetation cover
2. ✘ Humidity
3. ✘ Transpiration
4. ✘ Intensity and duration

Question Number : 129 Question Id : 630680279880 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Identify the type of shape of watershed which affects the flow of a hydrograph as shown below in the figure?



Options :

1. ✘ Fan shaped
2. ✘ Double fan shaped
3. ✔ Converging shaped
4. ✘ Diverging shaped

Question Number : 130 Question Id : 630680279881 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Which of the following statement regarding the benefits of Integrated Watershed Management with respect to socio-economic aspects is INCORRECT?

Options :

1. ✘ Obtaining more rational structure of land use that is reduced cultivated farmland, increased forest and grasslands, reduced waste lands
2. ✔ Decreasing the grain production in the course of the construction of basic farmlands
3. ✘ Increasing the productivity of land and the per capita income of farmers
4. ✘ Reducing water and soil losses

Question Number : 131 Question Id : 630680279882 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Arrange the following steps of the Watershed Planning Process in chronological order?

1. Monitor and evaluate past activities and identify problems and opportunities
2. Identify alternative management practices (i.e., projects) to implement the formulated strategies within the limits of the constraints
3. Appraise and evaluate the impacts of the alternative management practices (i.e., projects) including the environmental, social, and economic effects and assess the uncertainty associated with the impacts
4. Identify the main characteristics of the problems confronted, opportunities to resolve these problems, and establish the objectives and constraints to accomplish these objectives. This eventually leads to the formulating strategies for action
5. Rank or prioritize the alternative management practices and recommend the project to be implemented when a recommendation is requested

Options :

1. ✘ 1-2-3-4-5
2. ✔ 1-4-2-3-5
3. ✘ 2-3-4-1-5
4. ✘ 3-4-1-5-2

Question Number : 132 Question Id : 630680279883 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0

Choose the suitable option regarding the large watersheds.

**Statement 1:** Large watersheds have well-developed channel networks and channel phase, and thus channel storage is dominant

**Statement 2:** Large watersheds are highly sensitive to high intensity, short-duration rainfalls

Options :

1. ✔ Statement 1 is true and Statement 2 is false
2. ✘ Statement 1 is false and Statement 2 is true

3. ✖ Both Statement 1 and Statement 2 are true
4. ✖ Both Statement 1 and Statement 2 are false

**Question Number : 133 Question Id : 630680279884 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Under rain harvesting structures, which of the following are artificial depressions constructed at the lowest portion of an agricultural field primarily to provide protective irrigation?

**Options :**

1. ✖ Contour bunds
2. ✖ Field bunds
3. ✔ Farm ponds
4. ✖ Small percolation tanks

**Question Number : 134 Question Id : 630680279885 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

If  $R$  is the total rainfall in  $cm$  for a duration of  $T$  hours, then the mean intensity of rainfall,  $I$  in  $cm$  per hour taken over the total duration of the storm is given by?

**Options :**

1. ✖  $I = RT$
2. ✔  $I = \frac{R}{T}$
3. ✖  $I = \frac{T}{R}$
4. ✖  $I = \frac{2R}{T}$

**Question Number : 135 Question Id : 630680279886 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Choose the correct option regarding the benefits of farm ponds?

**Statement 1:** Farm ponds provides protective irrigation during monsoon

**Statement 2:** If the farm ponds are constructed near an open well, it gets recharged

**Options :**

1. ✖ Statement 1 is true and Statement 2 is false
2. ✖ Statement 1 is false and Statement 2 is true
3. ✔ Both Statements are true
4. ✖ Both Statements are false

**Question Number : 136 Question Id : 630680279887 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Among the following, the causes of flood is/are:

1. Massive rainfall
2. Collapsed dams
3. Overflowing of the rivers

**Options :**

1. ✖ Only 2
2. ✖ Both 1 and 2
3. ✖ Both 1 and 3
4. ✔ 1, 2 and 3

**Question Number : 137 Question Id : 630680279888 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Consider the following statements with regards to Flood control by construction of diversion channels:

1. By constructing a branch channel to the main river channel, the stage level of the river can be reduced by diverting a part of its water to the branch channel. Such a branch diversion channel is also known as a floodway
2. The method is very effective in flood control and much safer than the construction of dikes or other flood control structures.

Of the above, choose correct option from below?

**Options :**

1. ✖ Statement 1 is true and Statement 2 is false
2. ✖ Statement 1 is false and Statement 2 is true
3. ✔ Both Statements are true
4. ✖ Both Statements are false

**Question Number : 138 Question Id : 630680279889 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

The National watershed development project for rainfed areas is implemented by the \_\_\_\_\_?

**Options :**

1. ✔ Ministry of Agriculture
2. ✖ Ministry of rural development
3. ✖ Ministry of environment and forest
4. ✖ Desert Development Programme

**Question Number : 139 Question Id : 630680279890 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement regarding the objectives of National Watershed Development Project for Rainfed Areas (NWDPA) is INCORRECT?

**Options :**

1. ✖ Restoration of ecological balance in the degraded and fragile rainfed ecosystems by greening these areas through appropriate mix of trees, shrubs and grasses
2. ✖ Creation of sustained employment opportunities for the rural community including the landless
3. ✖ Conservation, development and sustainable management of natural resources including their use
4. ✔ Increase in regional disparity between irrigated and rainfed areas

**Question Number : 140 Question Id : 630680279891 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

In watershed characteristics, the parameter which is defined as an area of the basin divided by the square of axial length of the basin; where obtained value is less than 1, is known as \_\_\_\_\_?

**Options :**

1. ✔ Form factor
2. ✖ Shape factor
3. ✖ Basin slope
4. ✖ Elongation ratio

**Question Number : 141 Question Id : 630680279892 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

In Channel characteristics under hydrology, the parameter which is denoted as the elevation difference between the endpoints of the main channel divided by the channel length is called as?

**Options :**

1. ✖ Channel Order
2. ✖ Channel Degree
3. ✖ Channel Profile
4. ✔ Channel Slope

**Question Number : 142 Question Id : 630680279893 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statements regarding the Stochastic modeling (which is also used in hydrologic modeling) is FALSE?

**Options :**

1. ✖ Produces a set of possible outcomes for a problem
2. ✖ All properties are random, or inputs are random variables leading to different outputs
3. ✔ Stochastic modeling is less complex; it follows a set path and does not deflect due to randomness or uncertainty
4. ✖ The Monte Carlo simulation is an example of stochastic model

**Question Number : 143 Question Id : 630680279894 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following with respect to various hydrologic models and their characteristics is correctly paired?

**Hydrologic mode : Characteristics**

1. deterministic models - Physically based models
2. black box models - Parametric models
3. conceptual models - Empirical models

**Options :**

1. ✖ Only 3
2. ✖ Both 2 and 3
3. ✔ Only 1
4. ✖ Both 1 and 2

**Question Number : 144 Question Id : 630680279895 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Choose the correct option regarding the Block-Box model and Conceptual model under hydrologic modeling?

**Statement 1:** Black-box models which do not explicitly take into account the governing laws but only the cause effect relation of system inputs to outputs, in a very general and purely empirical manner.

**Statement 2:** Conceptual models reflecting fundamental laws of physics in a simplified approximate manner and involving in general a certain degree of empiricism (grey- box models)

**Options :**

1. ✖ Statement 1 is true and Statement 2 is false
2. ✖ Statement 1 is false and Statement 2 is true
3. ✔ Both Statements are true
4. ✖ Both Statements are false

**Question Number : 145 Question Id : 630680279896 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following statement regarding the advantages of distributed models, grid-based models and physically based models under hydrologic modeling is INCORRECT?

**Options :**

1. ✔ Model parameters are not identical with prototype characteristics
2. ✖ Applicability to gauged or ungauged basins or areas
3. ✖ Direct usability of available areal information e.g. remote sensing information (satellite images etc)
4. ✖ Application of fundamental laws of hydro and thermodynamics, etc.

**Question Number : 146 Question Id : 630680279897 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

While classifying black box model under hydrologic modeling, ARMAX model is an example of?

**Options :**



1.  Auto regressive models
2.  Linear regression and gauge to gauge correlation models
3.  Unit hydrograph based / linear model
4.  Hydro informatics based models

**Question Number : 147 Question Id : 630680279898 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Choose the correct option regarding the Lumped models under hydrologic modeling.

**Statement 1:** Lumped-parameter models refer to the absence of space-dependency, therefore, they are zero-dimensional in space; they are based on an assumption of uniform conditions throughout the system modelled.

**Statement 2:** Lumped models are also referred as the Black-box models.

**Options :**

1.  Statement 1 is true and Statement 2 is false
2.  Statement 1 is false and Statement 2 is true
3.  Both Statements are true
4.  Both Statements are false

**Question Number : 148 Question Id : 630680279899 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

\_\_\_\_\_ are empirical type models under hydrologic modeling, involving mathematical equations that have been assessed, not from physical processes in the catchment, but from analyses of concurrent input and output time series.

**Options :**

1.  Black box models
2.  Deterministic models
3.  Distributed physically based models
4.  Grey box models

**Question Number : 149 Question Id : 630680279900 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

Which of the following characteristics of conceptual model under hydrologic modeling is INCORRECT?

**Options :**

1.  Complex and cannot be easily implemented in computer code
2.  Require large hydrological and meteorological data
3.  Based on modeling of reservoirs and include semi empirical equations with a physical basis
4.  Parameters are derived from field data and calibration

**Question Number : 150 Question Id : 630680279901 Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 1 Wrong Marks : 0**

SWAT model (Soil and Water Assessment Tool) under hydrologic modeling is an example of \_\_\_\_\_?

**Options :**

1.  Physically based model
2.  Conceptual model
3.  Empirical model
4.  Data based model