

PROVISIONAL ANSWER KEY

Question 88/2023/OL

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Department Ground Water

Question1:-The term corresponds numerically to the difference between the specific yield and the total effective porosity.

A:-Storativity

B:-Total head

C:-Specific capacity

D:-Specific retention

Correct Answer:- Option-D

Question2:-The formation in which the pore water pressure generally less than atmospheric pressure.

A:-Bed rock

B:-Saturated zone

C:-Phreatic zone

D:-None of the above

Correct Answer:- Option-D

Question3:-Water in which salinity tends to reflect various episodes in local geological history, such as prehistoric incursions of the sea.

A:-Condensation water

B:-Meteoric water

C:-Connate water

D:-Juvenile water

Correct Answer:- Option-C

Question4:-Darcy's law is applicable only for

A:-turbulent and porous media

B:-laminar and porous media

C:-laminar and nonporous media

D:-both laminar and turbulent flows

Correct Answer:- Option-B

Question5:-The residence time for groundwater is approximately

A:-2 weeks to 10,000 yrs

B:-4000 yrs

C:-10-1000 yrs

D:-10 yrs

Correct Answer:- Option-A

Question6:-Which among the following is correct regarding a groundwater basin?

(i) It is hydrogeologic unit with one large aquifer or several connected and interconnected aquifers.

(ii) An area of the earth's crust that is underlain by a thick sequence of sedimentary rocks.

(iii) In limestone areas, the drainage and groundwater basins have the same configurations.

A:-Only (ii) and (iii)

B:-Only (i) and (ii)

C:-All of the above

D:-Only (i)

Correct Answer:- Option-D

Question7:-Aquifers that are completely confined or unconfined, found in alluvial valleys, plains or former lake basins where a permeable stratum is overlain or underlain by semi pervious aquitard is known as

A:-Perched aquifer

B:-Leaky aquifer

C:-Idealized aquifer

D:-Water table aquifer

Correct Answer:- Option-B

Question8:-A spring resulting from the expansive force of superheated steam within constricted subsurface channels.

A:-Mudpot

B:-Geyser

C:-Fracture springs

D:-Contact springs

Correct Answer:- Option-B

Question9:-Lake volume change, evaporation and precipitation of lake can be estimated by using

A:-Taylor evaporation method

B:-Thornthwaithe - Holz-man equation

C:-Groundwater budget

D:-Hydraulic head

Correct Answer:- Option-C

Question10:-Which among the following statement is true regarding porosity?

- (i) Rocks have higher porosities than soils.
- (ii) Gravels, sands and silts which are made up of angular and rounded particles, have higher porosities than soils rich in platy clay minerals.
- (iii) Poorly sorted deposits have lower porosities than well-sorted deposits.
- (iv) Clay-rich soils have higher porosities but lower hydraulic conductivities.

A:-Only options (i) and (ii)

B:-Only options (i) and (iii)

C:-Only options (i), (ii) and (iii)

D:-Only options (iii) and (iv)

Correct Answer:- Option-D

Question11:-Which geological formation can provide small domestic water supply from shallow, large diameter wells?

A:-Sandstone

B:-Clay

C:-Basalt

D:-Conglomerates

Correct Answer:- Option-B

Question12:-Which among the following is true regarding the capillary rise?

- (i) The wider the tube, the higher the water level rises.
- (ii) The narrower the tube, the higher the water level rises.
- (iii) There is no relation between the pore size and water level rise.

A:-Only (i)

B:-Only (ii)

C:-Only (iii)

D:-None of the above

Correct Answer:- Option-B

Question13:-Spring that are found only in Karst aquifers.

A:-Tubular spring

B:-Fracture spring

C:-Fault springs

D:-Doline spring

Correct Answer:- Option-D

Question14:-Choose the correct statement from the below options:

- (i) Volcanic rock can form highly permeable aquifers.
- (ii) In sandstone, the porosity and yield have been increased by cement.
- (iii) Igneous and metamorphic rocks are impermeable in nature.
- (iv) Rhyolites are less permeable than basalt.

A:-Only (i)

B:-Only (i) and (ii)

C:-All of the above

D:-Only (i), (iii) and (iv)

Correct Answer:- Option-D

Question15:-Choose the correct definition for Darcy's law:

A:-The flow rate through a porous media is proportional to the hydraulic gradient and inversely proportional to the area of the flow path.

B:-The flow rate through a porous media is proportional to the head loss and inversely proportional to the length of the flow path.

C:-The flow rate through a non-porous media is proportional to the head loss and inversely proportional to the length of the flow path.

D:-The flow rate through a non-porous media is proportional to the head loss and inversely proportional to the area of the flow path.

Correct Answer:- Option-B

Question16:-The instrument used for measuring soil moisture is

A:-Gravimeter

B:-Neutron probe

C:-Tensiometer

D:-Hydrometer

Correct Answer:- Option-B

Question17:-The hydraulic conductivity of a soil/rock depend on

A:-Arrangement of particles

B:-Shape of particles

C:-Size of particles

D:-All of the above

Correct Answer:- Option-D

Question18:-The unit of Transmissivity is given by

A:-m/day

B:- m^2 /day

C:- m^3 /day

D:-dimensionless

Correct Answer:- Option-B

Question19:-Match the following items in Set A with Set B:

Set A		Set B
(a) Aquiclude	-	(i) Clay
(a) Aquifer	-	(ii) Solid granite
(a) Aquifuge	-	(iii) Sandy clay
(a) Aquitard	-	(iv) Gravel

A:-a-(i), b-(ii), c-(iii), d-(iv)

B:-a-(ii), b-(i), c-(iii), d-(iv)

C:-a-(i), b-(iv), c-(ii), d-(iii)

D:-a-(ii), b-(i), c-(iv), d-(iii)

Correct Answer:- Option-C

Question20:-Recharge rates are maximum in which of the given formations.

A:-Hard rock formations

B:-Sandstones

C:-Coastal alluvium

D:-Indo-Gangetic alluvium

Correct Answer:- Option-D

Question21:-In the Global water supply, groundwater contributes about

A:-2.14%

B:-0.61%

C:-0.009%

D:-0.001%

Correct Answer:- Option-B

Question22:-In the statements given below, which among the following supports the process of evaporation:

(i) If the number passing to the vapor state exceed the number joining the liquid, it results

in evaporation.

(ii) When water passes from the liquid to the vapor state, it will absorb about 590 cal of

heat.

(iii) The vapor pressure of the liquid is inversely proportional to the temperature.

(iv) Evaporation will proceed until the air becomes saturated with moisture.

A:-Only (i)

B:-Only (i) and (ii)

C:-Only (i), (ii) and (iii)

D:-Only (i), (ii) and (iv)

Correct Answer:- Option-D

Question23:-The hydrologic outputs from an area may include

A:-Precipitation

B:-Evapotranspiration from land areas

C:-Surface water runoff

D:-Both (2) and (3)

Correct Answer:- Option-D

Question24:-The least porosity that can be attained with the same grains is found in

A:-Rhombohedral packing

B:-Cubic packing

C:-Octahedral packing

D:-Tetrahedral packing

Correct Answer:- Option-A

Question25:-If the hydraulic conductivity 'k' is independent of the direction of measurement, then the formation is said to be

A:-Anisotropic

B:-Isotropic

C:-Homogeneous

D:-Heterogeneous

Correct Answer:- Option-B

Question26:-Which among the following statement is true regarding permeameters?

- (i) Permeameters can be used to measure the storage coefficient of the aquifers.
- (ii) The falling head permeameter is used for noncohesive sediments.
- (iii) The constant head permeameter is used for cohesive sediments.

A:-Option (i)

B:-Option (ii) and (iii)

C:-Option (iii)

D:-None of the option is true

Correct Answer:- Option-D

Question27:-Subtraction of depth of water in the piezometer on the basis of water from surface elevation.

A:-Head loss

B:-Hydraulic head

C:-Constant head

D:-Hydraulic gradient

Correct Answer:- Option-B

Question28:-In which of the following condition the Bernoulli equation or principle not be used?

A:-Viscous flow

B:-Incompressible fluid

C:-Steady flow

D:-Laminar flow

Correct Answer:- Option-A

Question29:-The area which represent the height above a datum plane at which the water level stands in tightly cased wells that penetrates the aquifer.

A:-Saturated surface

B:-Unsaturated surface

C:-Equipotential line

D:-Potentiometric surface

Correct Answer:- Option-D

Question30:-The area which include the contact between an aquifer composed of sand and a laterally adjacent bed composed of clay.

A:-Equipotential boundary

B:-Permeable boundary

C:-Impermeable boundary

D:-Lateral boundary

Correct Answer:- Option-C

Question31:-Which one of the following point/points are determining the yield of groundwater system and evaluating the movement?

- (i) The position and thickness of aquifers and confining beds.
- (ii) The transmissivity and storage coefficient of the aquifers.
- (iii) The hydraulic characteristics of the confining beds.
- (iv) The position and nature of the aquifer boundaries.

A:-Only (i) and (ii)

B:-Only (ii) and (iv)

C:-Only (i) and (iv)

D:-All of the above

Correct Answer:- Option-D

Question32:-The reason behind saturation by rain and capillary rise destroy the film causing loss of stability.

A:-Gravitational moisture

B:-Capillary moisture

C:-Hygroscopic moisture

D:-None of the above

Correct Answer:- Option-C

Question33:-The depth to the water in a non-flowing well is subtracted from the altitude of the measuring point, then the result should be

A:-Velocity head

B:-Mean Sea level

C:-Total head

D:-Pumping rate

Correct Answer:- Option-C

Question34:-Which among the following statement is true regarding fractures?

- (i) Crystalline rocks often have a fracture set that parallels the ground surface.

(ii) The density of fractures and the permeability of fractured rock decreases with depth.

(iii) With increasing depth, the average fracture aperture decreases.

A:-Only (i) and (ii)

B:-Only (ii) and (iii)

C:-Only (i) and (iii)

D:-All of the above

Correct Answer:- Option-D

Question35:-The average amount of time that a water molecule resides in a particular reservoir before transferring to another reservoir is calculated as

A:-Volume of a reservoir multiplied by the total flux in or out of the reservoir

B:-Volume of a reservoir divided by the total flux in or out of the reservoir

C:-Volume of a reservoir subtracted by the total flux in or out of the reservoir

D:-None of the above

Correct Answer:- Option-B

Question36:-Which among the following process affect the porosity and permeability of carbonate rocks when it is buried deeply?

A:-Compression

B:-Cementing

C:-Recrystallisation

D:-All of the above

Correct Answer:- Option-D

Question37:-The lateral flow of water from the unsaturated zone to the surface water body.

A:-Baseflow

B:-Interflow

C:-Overland flow

D:-Quick flow

Correct Answer:- Option-B

Question38:-Which among the following equation shows the correct relationship of porosity (n) and void ratio (e) of a porous media?

A:- $n = \frac{e}{1+e}$

B:- $n = \frac{1+e}{e}$

C:- $n = \frac{e}{e+2}$

D:- $n = \frac{e+2}{e}$

Correct Answer:- Option-A

Question39:-The crest of the water table, with flow on either side going in opposite directions.

A:-Equipotential surface

B:-Watershed

C:-Groundwater divide

D:-Groundwater basin

Correct Answer:- Option-C

Question40:-Lysimeter is used to determine which among the following parameters?

A:-Runoff

B:-Permeability

C:-Infiltration

D:-Evapotranspiration

Correct Answer:- Option-D

Question41:-Which of the following remains constant in the steady state system?

A:-Mass

B:-Energy

C:-Momentum

D:-Density

Correct Answer:- Option-A

Question42:-A reaction occurs in a vessel such that its mass does not change but its temperature is increased, then the system is which of the following?

A:-Steady-state

B:-Unsteady-state

C:-Cannot say

D:-None of the mentioned

Correct Answer:- Option-B

Question43:-The discharge per unit drawdown at a well is known as

A:-Specific yield

B:-Specific storage

C:-Safe yield

D:-Specific capacity

Correct Answer:- Option-D

Question44:-_____ wells are constructed when low yielding groundwater sources are found relatively close to the surface, usually less than 30 m (100 ft.). These are constructed using a rotary bucket auger.

A:-Cap

B:-Drilling

C:-Bored

D:-Surface

Correct Answer:- Option-C

Question45:-Which aquifer is called water table aquifer?

A:-Unconfined aquifer

B:-Confined aquifer

C:-Ground aquifer

D:-Connate aquifer

Correct Answer:- Option-A

Question46:-Which sedimentary rock is told to be the best kind of formation for groundwater?

A:-Sandstone

B:-Shale

C:-Gravel

D:-Limestone

Correct Answer:- Option-C

Question47:-The yield of a well depends on _____.

A:-Permeability of soil

B:-Area of aquifer opening into the wells

C:-Actual flow velocity

D:-Permeability and actual flow velocity

Correct Answer:- Option-A

Question48:-The performance of a well is measured by its _____.

A:-Specific capacity

B:-Specific yield

C:-Storage coefficient

D:-Permeability coefficient

Correct Answer:- Option-A

Question49:-When two wells are situated near each other, the discharge in individual well is _____.

A:-increased

B:-decreased

C:-not effected

D:-remains same with respect to each other

Correct Answer:- Option-B

Question50:-What is the speciality of the Artesian Water?

A:-Has a characteristic colour

B:-Has a characteristic odour

C:-Requires no pumping

D:-Requires special type of pumping

Correct Answer:- Option-C

Question51:-The term which is collectively responsible, along with specific yield, for total porosity of an aquifer is _____.

A:-Unit yield

B:-Specific retention

C:-Unit retention

D:-Specific allowance

Correct Answer:- Option-B

Question52:-What is the isolated water table held by a small extension of impervious rock called?

A:-Underlying water

B:-Secret water

C:-Perched water

D:-Underwater

Correct Answer:- Option-C

Question53:-What is the upper surface of water in a confined aquifer called?

A:-Primary layer

B:-Secondary layer

C:-First layer

D:-Piezometric layer

Correct Answer:- Option-D

Question54:-Groundwater is a source of trouble at which place?

A:-Plains

B:-Slopes

C:-Rivers

D:-Lakes

Correct Answer:- Option-B

Question55:-The method in which 4 electrodes are driven in the ground at equal distance apart and in a straight line upto a depth which the ground distance is to be measured.

A:-Seismic refraction method

B:-Geophysical method

C:-Electrical resistivity method

D:-Current extraction method

Correct Answer:- Option-C

Question56:-Which of the following is proved to be useful, ongoing over the site?

A:-Excavation

B:-Escarpments

C:-Flood marks

D:-All of the mentioned

Correct Answer:- Option-D

Question57:-The number of blows required to drive the penetrometer into the ground through a distance of 300 mm is measured which is known as _____ of the soil.

A:-Standard penetration resistance

B:-Bearing power of soil

C:-Maximum safe bearing capacity

D:-Allowable bearing pressure

Correct Answer:- Option-A

Question58:-The shock waves so produced travel down in the sub soil strata and get reflected after striking a hard rock surface below and recorded by the instrument known as _____.

A:-Microphone

B:-Geophone

C:-Receiver

D:-Sensors

Correct Answer:- Option-B

Question59:-What is the volume of voids in a rock mass expressed in percentage of total volume of rock called?

A:-Porosity

B:-Voids ratio

C:-Permeability

D:-Specific yield

Correct Answer:- Option-A

Question60:-The following is the name of the instrument used to record earthquake waves:

A:-Seismograph

B:-Seismogram

C:-Seismometer

D:-Scintillometer

Correct Answer:- Option-A

Question61:-An example of aquitard stratum in the ground profile is a layer of

_____.

A:-Granite rock

B:-Clay

C:-Sandy clay

D:-Sandstone

Correct Answer:- Option-C

Question62:-The clogging of well screens and consequent reduction in pump efficiency is indicated by _____.

A:-the high value of the well-loss

B:-the low value of the well-loss

C:-variable value of the well-loss

D:-both high and low value of the well-loss

Correct Answer:- Option-A

Question63:-Which type of tools can be used to measure the density of the formation fluid?

A:-Bulk density logging tool

B:-Formation density logging tool

C:-Neutron density logging tool

D:-Nuclear Fluid Densimeter

Correct Answer:- Option-D

Question64:-What does the high capture cross-section signifies?

A:-Water Bearing Formation

B:-Oil Bearing Formation

C:-Gas Bearing Formation

D:-Hydrocarbon Bearing Formation

Correct Answer:- Option-A

Question65:-The general exploration gives information about which of the following features?

A:-Depth of rock

B:-Composition of soil strata

C:-Ground water level

D:-All of the mentioned

Correct Answer:- Option-D

Question66:-Ground water samples should be collected at least up to a distance _____ km.

A:-2

B:-3

C:-4

D:-5

Correct Answer:- Option-D

Question67:-Leachate containing lead causes _____ in humans in case of long term exposure.

A:-Anorexia

B:-Tremor

C:-Anaemia

D:-Renal failure

Correct Answer:- Option-A

Question68:-Groundwater contamination from pesticide storage falls under _____ category source.

A:-Agriculture

B:-Commercial

C:-Industrial

D:-Residential

Correct Answer:- Option-A

Question69:-An associated protection of rising water-table is the development of _____.

A:-Loss of nutrients

B:-Loss of good quality of water

C:-Salinity of water

D:-Increase in turbidity

Correct Answer:- Option-C

Question70:-How groundwater contamination occurs from landfill?

A:-Through leachate

B:-Dust

C:-Chemicals

D:-Rodents

Correct Answer:- Option-A

Question71:-SDWA established _____ drinking water source protection programs.

A:-1

B:-2

C:-3

D:-4

Correct Answer:- Option-C

Question72:-The rock which shows great variation in water yielding capacity is _____.

A:-Sandstone

B:-Granite

C:-Coal

D:-Marble

Correct Answer:- Option-A

Question73:-Groundwater table may be lowered by method

A:-Electro - osmosis method

B:-Vacuum method

C:-Well point system

D:-All of the above

Correct Answer:- Option-D

Question74:-Hydrograph is the graphical representation of

A:-Runoff and time

B:-Surface runoff and time

C:-Groundwater flow and time

D:-Rainfall and time

Correct Answer:- Option-A

Question75:-In India, what is the major cause of water-borne diseases?

A:-Pollution of water

B:-The hardness of water

C:-Scarcity of water

D:-Saline water

Correct Answer:- Option-A

Question76:-Which disease amongst the following is caused by drinking contaminated water?

A:-Diarrhea

B:-Typhoid

C:-Polio

D:-All of the above

Correct Answer:- Option-D

Question77:-How many types of organic matter are present in the water?

A:-Five

B:-Four

C:-Two

D:-Three

Correct Answer:- Option-C

Question78:-When an aquifer is used to artificially recharge by making it pass through an intervening layer, the aquifer acts as _____.

A:-A cooling agent

B:-An aerating agent

C:-An odour agent

D:-A filter plant

Correct Answer:- Option-D

Question79:-Alkalinity in water is expressed as milligrams per liter in terms equivalent to

A:-Magnesium carbonate

B:-Calcium carbonate

C:-Calcium hydrate

D:-Sodium carbonate

Correct Answer:- Option-B

Question80:-Environment Protection Act was implemented in:

A:-1974

B:-1986

C:-1988

D:-1997

Correct Answer:- Option-B

Question81:-Which one is considered as the potential aquifer of Kerala along coastal plains?

A:-Alluvial deposits

B:-Charnockite

C:-Laterite

D:-Khondalite

Correct Answer:- Option-A

Question82:-Kerala receives an average annual rain fall of

A:-2000 mm

B:-4000 mm

C:-3060 mm

D:-1050 mm

Correct Answer:- Option-C

Question83:-A District of Kerala in which rising trend in ground water level in wells is observed

A:-Kasaragod

B:-Wayanad

C:-Kottayam

D:-Alappuzha

Correct Answer:- Option-B

Question84:-Block in Kerala which has been classed as critical

A:-Kanhangad

B:-Karadka

C:-Kasaragod

D:-Manjeshwar

Correct Answer:- Option-C

Question85:-Fluoride contamination is seen in

A:-Thiruvananthapuram

B:-Palakkad

C:-Kottayam

D:-Thrissur

Correct Answer:- Option-B

Question86:-The term which is used to describe all types of liquid waste

A:-Sewage

B:-Garbage

C:-Leachate

D:-Smog

Correct Answer:- Option-A

Question87:-Arsenic contamination of ground water is seen in which state of India?

A:-Kerala

B:-West Bengal

C:-Haryana

D:-Karnataka

Correct Answer:- Option-B

Question88:-Which city in India is facing acute water shortage?

A:-Thiruvananthapuram

B:-Bangalore

C:-Mumbai

D:-Chennai

Correct Answer:- Option-D

Question89:-Largest consumer of ground water in the world

A:-United States

B:-China

C:-India

D:-Russia

Correct Answer:- Option-C

Question90:-Which among the following is considered as the very successful method for conserving ground water?

A:-Artificial recharge

B:-Population control

C:-Rain water harvesting

D:-Waste treatment

Correct Answer:- Option-C

Question91:-The amount of water stored in the soil is known as

A:-Porosity

B:-Specific yield

C:-Effective porosity

D:-Soil moisture

Correct Answer:- Option-D

Question92:-Most commonly seen aquifer in Alappuzha are

A:-Charnockite

B:-Khondalite

C:-Shale

D:-Laterite

Correct Answer:- Option-D

Question93:-An example for a plateau in the Kerala region is

A:-Munnar

B:-Palakkad gap

C:-Kottayam

D:-Kannur

Correct Answer:- Option-A

Question94:-The crystalline rocks of Kerala region belongs to which geologic age

A:-Tertiary

B:-Paleozoic

C:-Mesozoic

D:-Archean

Correct Answer:- Option-D

Question95:-Most developed aquifer system among the Tertiary group in Kerala

A:-Quilon

B:-Alleppey

C:-Warkalli

D:-Vaikom

Correct Answer:- Option-C

Question96:-Among the given rocks which crystalline rocks in Kerala are better aquifers

A:-Charnockites

B:-Gabbro

C:-Granites

D:-Khondalites

Correct Answer:- Option-A

Question97:-Which district in Kerala has reported more amount of bacterial contamination?

A:-Alappuzha

B:-Kottayam

C:-Quilon

D:-Kasaragod

Correct Answer:- Option-A

Question98:-High salinities are found in soils and ground water of

A:-Tropical climate

B:-Temperate climate

C:-Sub-tropical climate

D:-Arid climate

Correct Answer:- Option-D

Question99:-Which among the following is considered as the least porous material

A:-Silt

B:-Clay

C:-Sandstone

D:-Shale

Correct Answer:- Option-D

Question100:-Recharge area is that region which

A:-Supplies water to a confined aquifer

B:-Supplies water to a unconfined aquifer

C:-Supplies water to an perched aquifer

D:-Takes water from confined aquifer

Correct Answer:- Option-A