

PU Ph D Earth Sciences

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152 PU_2015_110_New

Which one of the following would indicate the former presence of a glacial lake?

- loess
- varved clay
- till
- out wash sands

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129 PU_2015_110_New

Which of the following is NOT true for Komatiites?

- are associated with greenstone belts
- are of Archean age
- these are ultramafic lavas
- characterized by ophitic texture

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118 PU_2015_110_New

Tonalites extensively occur in Archean terrains. These rocks essentially consist of:-

- Quartz = 30 %, Plagioclase = 30 %, Alkali feldspar = 30 % and hypersthene equals 10 %
- Quartz = 30 %, Plagioclase <10 %, Alkali feldspar >50 % and hornblende = 10 %
- Quartz = 30 %, Plagioclase = 30 %, Alkali feldspar = 30 % and hornblende equals 10 %
- Quartz = 30 %, Plagioclase >50 %, Alkali feldspar <10 % and hornblende = 10 %

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117 PU_2015_110_New

Which one of the following statement is correct regarding the relative values of entropy at 600 °C among the minerals microcline, orthoclase and sanidine?

- Sanidine has the highest entropy value
- Microcline has the highest entropy value
- Orthoclase has the highest entropy value
- All the minerals have equal entropy value

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139 PU_2015_110_New

In the normal limb of a fold, the dip of the cleavage is _____ than/to the bedding dip.

- smaller
- greater
- similar

half

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140 PU_2015_110_New

In the triangular ACF diagrams used to designate the mineralogical and chemical composition of metamorphic facies, the 'A' apex represents:-

- $\text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3 - \text{K}_2\text{O}$
- $\text{Al}_2\text{O}_3 + \text{Na}_2\text{O} + \text{K}_2\text{O}$
- $\text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3 - \text{Na}_2\text{O} - \text{K}_2\text{O}$
- Al_2O_3

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155 PU_2015_110_New

The lowering effect on the water table about the base of the well stem is called a(n):-

- speleothem
- aquiclude
- cone of depression
- artesian surface

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149 PU_2015_110_New

Which of the following processes does not occur during diagenesis?

- metamorphism
- compaction
- cementation
- lithification

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125 PU_2015_110_New

Which of the following is example of meteorological satellite?

- IKONOS
- IRS 1D
- INSAT 1B
- Landsat 7

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127 PU_2015_110_New

In a hydrothermal ore forming process, second boiling refers to vapour saturation achieved by:-

- increase in pressure
- progressive crystallisation of anhydrous minerals

- addition of boiling hydrothermal water to magmatic water
- decrease in pressure

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159 PU_2015_110_New

Placing geologic events in sequential order as determined by their position in the rock record is called:-

- absolute dating
- relative dating
- correlation
- historical dating

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106 PU_2015_110_New

What causes magmatism above subduction zones?

- Mantle convection
- Melting of subducting plate
- Plume
- Fluids released from subducting plate

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102 PU_2015_110_New

There are 5 ways in which building blocks of crystal can be arranged in 2-dimensions giving rise to 5-plane lattices. In how many ways could these be arranged in 3- dimensions?

- 32
- 232
- 7
- 14

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146 PU_2015_110_New

Marine sediments deposited in water depths greater than about 12,000 feet usually lack:-

- fine grained material transported by the wind
- carbonate shells
- silica-rich shells
- all of these

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111 PU_2015_110_New

Aulacogen type of sedimentary basins form due to:-

- Failing of one of the rifts of triple-rift junction

- Thrusting in a collision related mountain building process
- Strike slip faulting along the margin of continent
- Subsidence due to normal faulting

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112 PU_2015_110_New

What is the symbol for a point group having three mutually perpendicular axes of two fold symmetry and a centre of symmetry?

- 2 mm
- 2/m 2/m 2/m
- 2 m
- 2

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103 PU_2015_110_New

Two atoms are likely to make an ionic bond if:-

- if both of them are non-metals
- there is not much difference in their electronegativity values
- there is large difference in their electronegativity values
- they are of equal size

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132 PU_2015_110_New

Snowball garnet is characteristic of _____ crystal growth.

- pre-kinematic
- syn-kinematic
- post-kinematic
- poly-kinematic

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135 PU_2015_110_New

In case of non-coaxial (simple shear) deformation, line of no longitudinal strain is _____ to the shear direction.

- parallel
- perpendicular
- at 45°
- at 25°

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104 PU_2015_110_New

Coordination number of a cation surrounded by anions in a crystal generally depends on the ratio of the radius of cation to anion. The coordination number:-

- will be half of the total bond length
- will be large if bond length is small
- will be small if radius ratio is large
- will be large if radius ratio is large

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Elements that partition strongly into the early crystallizing minerals are said to be:-

- Compatible
- Rare Earth elements
- Large Ion Lithophiles
- Incompatible

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145 PU_2015_110_New

Lack of ocean upwelling in the eastern Pacific is associated with:-

- Coriolis Effect
- Global warming
- El Nino
- La Nina

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114 PU_2015_110_New

The difference between tholeiitic and calc-alkaline basalts is mainly in:-

- quartz content
- calcium content
- iron and alumina content
- alkali content

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136 PU_2015_110_New

One of the following defines the condition for strike fault, where A and B are respectively pitch of the bedding trace and net slip on the fault plane.

- $A = 0$
- $A = 0, B = 45^\circ$
- $A = B$
- $B = 0$

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154 PU_2015_110_New

Which of the following sandstone types is most likely to form by the mechanical and intense chemical weathering of a granite?

- quartz arenite
- shale
- arkose
- litharenite

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150 PU_2015_110_New

Which of the following sedimentary environments is dominated by waves and tidal currents?

- deep marine
- deltaic
- glacial
- alluvial fans

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123 PU_2015_110_New

Which of the following is example of active remote sensing sensor?

- CCD array
- microwave radiometer
- synthetic Aperture Radar
- aerial camera

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120 PU_2015_110_New

Major evolution of atmospheric oxygen in Earth took place during:-

- 3.5-3.7 Ga
- 200 Ma
- 540 Ma
- 2.1-2.2 Ga

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105 PU_2015_110_New

A crystal that has only a center of symmetry belongs to point group:-

- m
- no point group
- 1
- 1 bar

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151 PU_2015_110_New

Siliceous environments, named for the silica-rich shells deposited in them, occur:-

- in an evaporite environment
- in a swamp environment
- in a reef environment
- in a deep-sea environment

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110 PU_2015_110_New

Suture Zone present in an orogenic belt is characterized by:-

- Molasse sediments
- Normal faults
- Oceanic crustal rocks and arc-trench sediments
- Horst and graben structures

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158 PU_2015_110_New

Which rock type makes a good cap rock for oil and gas reservoirs?

- shale
- conglomerate
- limestone
- sandstone

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126 PU_2015_110_New

The ability of a sensor to detect finite colour differences in a scene is called as:-

- spatial resolution
- radiometric resolution
- spectral resolution
- temporal resolution

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107 PU_2015_110_New

Carbonatite complexes are associated with:-

- Ophiolites
- Layered igneous complexes
- Alkaline rocks
- Flood basalts

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153 PU_2015_110_New

What is the porosity of newly deposited mud?

- between 5% and 25%
- between 25% and 50%
- 50%
- less than 5%

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143 PU_2015_110_New

Increased concentration of atmospheric CO₂ will lead to:-

- More stability of calcareous shells
- Higher pH of ocean
- Higher weathering of rocks
- Lower global temperature

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109 PU_2015_110_New

The northern margin of Indian plate is marked by:-

- Indus suture zone
- Shivaliks
- Tibet Plateau
- Himalaya

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130 PU_2015_110_New

In pelitic rocks chloritoid is favoured over chlorite in rocks having:-

- High-Al and high Fe/Mg ratio
- Low-Al and high Fe/Mg ratio
- High-K and high Al ratio
- High-Al and high Mg/Fe

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124 PU_2015_110_New

Which of the electromagnetic radiation can work in all weather conditions?

- Visible
- Near-Infrared
- Shortwave Infrared
- Microwave

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115 PU_2015_110_New

The composition of the bulk earth is similar to:-

- Moon
- Fe-Ni meteorites
- Mercury
- Carbonaceous chondrites

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142 PU_2015_110_New

Which of the following sedimentary environments would you expect the sand deposits to be poorly sorted?

- glacial
- beach
- alluvial
- desert

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101 PU_2015_110_New

Pyramid form in crystal consists of:-

- at least three non-parallel faces that are capable of intersecting in one point
- at least three non-parallel, non-intersecting faces
- at least three parallel faces
- at least two non-parallel faces intersecting in a line

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131 PU_2015_110_New

At an invariant point Φ (number of phase) is equal to _____ where C is the number of component.

- C+3
- C+1
- C
- C+2

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108 PU_2015_110_New

The sulphide mineral found in some stony-iron meteorites but not found on earth is:-

- Troilite
- Chalcocite

- Covellite
- Pentlandite

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156 PU_2015_110_New

Which of the following statements about the water table is false?

- the water table changes when discharge is not balanced by recharge
- the water table is generally flat
- the water table is above the land surface in lakes
- the water table is depressed near high volume pumping wells

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122 PU_2015_110_New

Hummocky cross stratification is a product of storm induced unidirectional current and they are generally formed in following depositional areas of a marine basin:-

- Outer shelf region
- Inner shoreface region
- Foreshore region
- Outer shoreface region

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137 PU_2015_110_New

One of the following defines the condition for Type-II fold interference, where AP_1 and f_1 are respectively the axial plane and fold axis of the early fold, and a_2 and b_2 are respectively displacement vector and fold axis of the later fold.

- $AP_1 \wedge a_2 \neq 0, f_1 \wedge b_2 = 0$
- $AP_1 \wedge a_2 \neq 0, f_1 \wedge b_2 \neq 0$
- $AP_1 \wedge a_2 = 0, f_1 \wedge b_2 = 45^\circ$
- $AP_1 \wedge a_2 = 0, f_1 \wedge b_2 \neq 0$

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119 PU_2015_110_New

If the average density of the continental crust with a thickness of 40 km is 2700 kg/m^3 and acceleration due to gravity is 9.8 m/s^{-2} then what will be the pressure expected at its base?

- 2.16 GPa
- 0.56 GPa
- 1.06 GPa
- 0.78 GPa

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Global continental glaciations and snowball earth like conditions existed during:-

- Mid Archean
- Late Neoproterozoic
- Cretaceous
- Mesoproterozoic

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141 PU_2015_110_New

Paired metamorphic belt is a characteristic feature of:-

- Sea floor spreading zone
- Continental rift zone
- Subduction zone
- Continental collision zone

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157 PU_2015_110_New

This kind of drainage suggests strong variations in erosional resistance of the bedrock:-

- trellis
- meandering
- dendritic
- deranged

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134 PU_2015_110_New

In case of prolate strain ellipsoid, there will be equal shortening in all direction on/along:-

- $\lambda_2\lambda_3$ plane
- λ_3 axis
- $\lambda_1\lambda_2$ plane
- $\lambda_1\lambda_3$ plane

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113 PU_2015_110_New

Divalent Ca and monovalent Na substitute for each other in plagioclase to give rise to different members of plagioclase series. The charge balance is achieved by:-

- incorporation of another monovalent cation like H in the structure
- keeping one cation site vacant
- simultaneous substitution of Al and Si
- creating or breaking one bond with one of the non-bridging oxygen

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147 PU_2015_110_New

In which of the following environments would you expect to find oscillation ripples?

- alluvial
- deep-sea
- beach
- desert

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138 PU_2015_110_New

If the pitch of a linear structure is 90° on a bed whose strike is $N30^\circ E$ and dip 50° towards SE, then the plunge of the linear structure will be:-

- 45°
- 60°
- 30°
- 50°

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100 PU_2015_110_New

Crystallographic axes of a crystal coincide with the three edges of a guide cube. If there exists a 3-fold axis of symmetry coinciding with the body diagonal of the guide cube then this crystal belongs to:-

- Isometric system
- Tetragonal system
- Trigonal system
- Orthorhombic system

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116 PU_2015_110_New

The sub-solvus granites are made up of Na-rich and K-rich alkali feldspars, both show exsolution textures. Under what conditions these granites crystallize?

- At Pressure = 0.5 GPa, H_2O saturated
- At Pressure = 0.5 GPa, H_2O absent
- At Pressure = 0.1 GPa, H_2O undersaturated
- At Pressure = 0.1 GPa, H_2O absent

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144 PU_2015_110_New

Coarse clastic material can be transported into a deep marine environment by:-

- rivers
- wind
- turbidity currents

- all of these

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133 PU_2015_110_New

The reaction 'Albite + Quartz = Jadeite' is characteristic of transition from:-

- greenschist to amphibolite facies
 blueschist to eclogite facies
 blueschist to greenschist facies
 amphibolite to granulite facies

60 of 100

148 PU_2015_110_New

Which of the following rocks is deposited only by non-biological, chemical precipitation?

- limestone
 coal
 halite
 chert arenite

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164 PU_2015_110_New

What type of sediments are produced by marine micro-organisms?

- iron and magnesium
 clay and silt
 evaporates
 siliceous and calcareous

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176 PU_2015_110_New

Hydrothermal deposits are recognised by:-

- occurrence in veins
 crustification texture
 wallrock alteration
 all the above

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169 PU_2015_110_New

Rare metal deposits are commonly associated with:-

- syenite
 granite pegmatite
 gabbro

carbonatite

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167 PU_2015_110_New

PGE refers to a group of six precious metals including:-

Pt-Pd-Rh-Ru-Ir-Os

Pt-Pd-Rh-Ru-Re-Os

Pt-Pd-Re-Os-Rh-Ru

Pt-Pd-Re-Os-Au-Ag

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160 PU_2015_110_New

Glacial striations on an outcrop trend NW-SE. The direction of ice movement was:-

either NW or SE

NE to SW

NW to SE

SW to NE

66 of 100

163 PU_2015_110_New

Which one of the following is a landform created by wave erosion?

sea arch

breakwater

spit

estuary

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170 PU_2015_110_New

One of the following pairs does not form exsolution intergrowth in ore mineral assemblages.

magnetite-ilmenite

pyrite-pyrrhotite

chalcopyrite-cubanite

chalcopyrite-sphalerite

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171 PU_2015_110_New

One of the following ore minerals is commonly not idiomorphic.

magnetite

sphalerite

galena

pyrite

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168 PU_2015_110_New

One of the following groups represents the rare metals.

- Li-Be-Nb
- Ce-Nd-Sm
- Sn-W-Mo
- Cu-Pb-Zn

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162 PU_2015_110_New

Trellis drainage is most likely to develop on:-

- natural levees
- tilted sedimentary rock layers
- granite
- horizontal layers of volcanic rocks

71 of 100

177 PU_2015_110_New

The ore metal of one of the following deposits is derived from silicate magma of intermediate composition, transported by and deposited from magmatic-hydrothermal fluid, and forms very large deposits of low grade ore.

- Greisen tungsten
- Porphyry copper
- Hydrothermal uranium
- Skarn tungsten

72 of 100

165 PU_2015_110_New

Why don't calcareous sediments form in the deep oceans?

- it is too cold
- calcium carbonate dissolves at great depth
- there is no sunlight
- there is no oxygen

73 of 100

175 PU_2015_110_New

This question is about the correct answer of the previous question. The host rock of the magmatic sulphide deposit is:-

- Gabbro

- Pyroxenite
- Carbonatite
- Dunite

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178 PU_2015_110_New

The ore metals of one of the following deposits are derived from basic volcanic rock, transported by and deposited from sea water-hydrothermal fluid, and forms massive sulphide deposits.

- Cyprus-type copper-zinc
- Sudbury-type nickel-copper
- Epithermal silver-lead
- Kuroko-type lead-zinc

75 of 100

161 PU_2015_110_New

Deccan volcanic flow started at the end of:-

- Cretaceous
- Permian period
- Jurassic
- Triassic

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166 PU_2015_110_New

The 3 domains involved in all the ore forming processes are:-

- Partial melting-transportation-deposition
- Dissolution-transportation-precipitation
- Melting-migration-crystallisation
- Source-migration path-ore trap

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174 PU_2015_110_New

One of the following is a magmatic sulphide deposit.

- Sudbury copper-nickel
- Cyprus-type copper-zinc
- Epithermal silver-lead
- Kuroko-type lead-zinc

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179 PU_2015_110_New

The ore metal of one of the following deposits is derived from rocks of continental crust, transported by meteoric water and deposited in organic carbon-rich zones of Phanerozoic arenaceous sediment.

- Quartz-pebble-conglomerate type uranium
- Redbed-type copper
- Unconformity-type uranium
- Sandstone-type uranium

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172 PU_2015_110_New

Refer to the four options of previous question and give answer to the following two questions. What is common to all these four minerals?

- Cubic system
- Opaque
- Metallic luster
- Perfect cleavage

80 of 100

173 PU_2015_110_New

The following statements describe how one of these four minerals is different from the others. Identify the wrong statement.

- Magnetite is the only oxide mineral
- Galena has distinctly high specific gravity among these minerals
- Magnetite has the highest reflectance among these minerals
- Galena is the only mineral which does not contain iron in wt % level

81 of 100

192 PU_2015_110_New

"Green marble" mined from Rishabdev area of Aravalli fold belt is:-

- epidote-bearing dolomitic marble
- diopside-bearing dolomitic marble
- actinolite-bearing dolomitic marble
- serpentinised peridotite

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194 PU_2015_110_New

In the process of froth flotation for concentrating sulphide ores, pine oil and oleic acid are used as:-

- collector
- frother and collector respectively
- modifier
- frother

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190 PU_2015_110_New

The asbestos mined from Pulivendla area of Cuddapah basin is a:-

- chrysolite
- chialstolite
- chrysotile
- cristobalite

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189 PU_2015_110_New

Asbestos deposits in Pulivendla area of Cuddapah basin occur:-

- at the contact zone between limestone and basic dyke
- at the contact zone between dolostone and basic dyke
- within limestone
- within dolostone

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186 PU_2015_110_New

Metals in one of the following options are recovered from their ores by acid leaching.

- gold and molybdenum
- silver and molybdenum
- silver and uranium
- gold and uranium

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198 PU_2015_110_New

One of the following is the characteristic mineral assemblage of greisen.

- Quartz-microcline-sodic plagioclase
- Quartz-muscovite-topaz-fluorite
- Quartz-orthoclase- sodic plagioclase
- Quartz-microcline-sodic plagioclase-fluorite

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193 PU_2015_110_New

A world class wollastonite deposit occurs in southern part of Delhi fold belt at:-

- Deri and Ambamata
- Belka Pahar and Khera Tarla
- Basantgarh and Pipela
- Balda and Dewa-ka-bera

88 of 100

184 PU_2015_110_New

One of the following ore minerals is not common in beach placer deposits.

- rutile
- hematite
- ilmenite
- magnetite

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191 PU_2015_110_New

A world class barite deposit occurs in Cuddapah basin at:-

- Vemula
- Kodur
- Vempalli
- Mangampet

90 of 100

185 PU_2015_110_New

Typical profile of a lateritic bauxite deposit consists of (from top to bottom):-

- bauxite-laterite-lithomarge-partially weathered bed rock-bed rock
- lithomarge-laterite-bauxite-partially weathered bed rock-bed rock
- lithomarge-bauxite-laterite-partially weathered bed rock-bed rock
- laterite-bauxite-lithomarge-partially weathered bed rock-bed rock

91 of 100

197 PU_2015_110_New

One of the following is not a hydrothermal deposit.

- Hutti gold deposit
- Bastar-Koraput tin deposit
- Degana tungsten deposit
- Malanjkhand copper deposit

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183 PU_2015_110_New

Uranium deposit types are correctly arranged in decreasing order of age (that is old to young) in one of the following.

- Unconformity Sandstone QPC
- Unconformity QPC Sandstone
- Sandstone Unconformity QPC
- QPC Unconformity Sandstone

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182 PU_2015_110_New

Boiling of fluid, mixing of fluids and fluid-rock interaction are the important processes responsible for:-

- leaching of metal from source rock
- transport of metal by a fluid phase
- dispersion of metal in a rock
- deposition of ore from a hydrothermal fluid

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195 PU_2015_110_New

In ore processing, size reduction of ore by crushing and grinding results in:-

- separation of gangue minerals
- concentration of ore minerals
- optimal liberation of ore minerals from gangue minerals
- all the above

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180 PU_2015_110_New

A basic assumption in the interpretation of fluid inclusions is that these are:-

- isobaric
- isochemical
- isochoric
- isothermal

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181 PU_2015_110_New

Degree of fill of a fluid inclusion refers to the relative proportion of:-

- liquid phase to the total volume of fluid inclusion
- liquid + vapour phases to the total volume of fluid inclusion
- daughter crystal to the total volume of fluid inclusion
- vapour phase to the total volume of fluid inclusion

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187 PU_2015_110_New

One of the following metals does not form any mineral in which it is a constituent element.

- Rhenium
- Platinum
- Niobium
- Cerium

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199 PU_2015_110_New

One of the following mineral deposits does not occur in skarn.

- Fe-Sn-W
- Cr-Ni-Ti
- Cu-Pb-Zn
- Wollastonite

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196 PU_2015_110_New

Jigging is a process in which minerals are separated according to their:-

- size
- water-adhering or air-adhering character
- magnetic susceptibility
- density

100 of 100

188 PU_2015_110_New

Apart from lode gold deposits, gold is produced in India from:-

- lead concentrate
- chromite
- copper concentrate
- uranium ore