Module Name : PhD Earth Sciences-E
Exam Date : 18-Sep-2020 Batch : 09:00-11:00

Sr. No.	Client Question ID	Question Body and Alternatives	Marks	Negative Marks
Objective Question				
1	1	The solubility of metals in hydrothermal fluid increases with complexation with ligands. Arrange the following common ligands in decreasing orders of Pearson's hardness. A1 : Cl^-, HS^-, SO_4^{2-}, OH^- A2 : OH^-, SO_4^{2-}, Cl^-, HS^- A3 : Cl^-, SO_4^{2-}, HS^-, OH^- A4 : HS^-, Cl^-, SO_4^{2-}, OH^-	4.0	1.00
Objective Question				
2	2	Cu in acidic hydrothermal water is likely to form the most stable complex with flowing ligand A1 : Cl^- A2 : OH^- A3 : SO_4^{2-} A4 : HS^-	4.0	1.00
Objective Question				
3	3	The diamonds are generally carried to surface of the Earth by kimberlite pipes, these were originally generated in the following part of the Earth A1 : Lower crust A2 : Upper Mantle A3 : Transition zone between Lower and Upper mantle A4 : Lower mantle	4.0	1.00
Objective Question				
4	4	Which of the following lanthanide element occur as both trivalent and tetravalent state in oxidised condition? A1 La	4.0	1.00

		: A2 : Ce A3 : Eu A4 : Yb		
Objective Question				
5	5	Which of the following mineral deposit forms principally because of sulphide liquid immiscibility? A1 : Porphyry type Cu-Mo A2 : Skarn type W A3 : Komatiite hosted Ni-Cu deposits A4 : Orogenic load Au	4.0	1.00
Objective Question				
6	6	Which of the following metal show highest sulphide-silicate partition coefficient? A1 : Ni A2 : Cu A3 : Co A4 : Pt	4.0	1.00
Objective Question				
7	7	Hydrothermal fluid in Porphyry-type copper deposits is dominantly derived from A1 : Meteoric water A2 : Seawater A3 : Magmatic water A4 : Metamorphic water	4.0	1.00
Objective Question				
8	8		4.0	1.00

		A reservoir gets 60% contribution from river water ($\delta^{18}O = -10‰$) and 40% contribution from glacial melt water ($\delta^{18}O = -30‰$). What will be the $\delta^{18}O$ of the reservoir? A1 : -18‰ A2 : -20‰ A3 : -22‰ A4 : -16‰		
Objective Question				
9	9	Marine organic carbon generally show following $\delta^{13}C$ values A1 : -15 ‰ A2 : -7 ‰ A3 : -25 ‰ A4 : -60 ‰	4.0	1.00
Objective Question				
10	10	In Skarn type deposits main metal sulphide deposition takes place during following stage A1 : Prograde – isochemical contact metamorphism A2 : Prograde – metasomatism and replacement A3 : Retrograde – meteoric fluid influx A4 : Equally in all the three stages	4.0	1.00
Objective Question				
11	11	Symmetry operations that generate space groups are A1 : Screw axis and glide planes. A2 : Rotation axis and a mirror plane perpendicular to it. A3 : Rotation axis and centre of symmetry. A4 Rotation axis, centre of symmetry and mirror plane.	4.0	1.00

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Objective Question				
12	12	Point group '23' belongs to which crystal system? A1 : Orthorhombic A2 : Trigonal A3 : Monoclinic A4 : Isometric	4.0	1.00
Objective Question				
13	13	Isostructural crystals have A1 : Same chemical formula and identical unit cell dimensions. A2 : Different chemical formula but identical unit cell dimensions. A3 : Different chemical formula and varying unit cell dimensions. A4 : Same chemical formula but varying unit cell dimensions.	4.0	1.00
Objective Question				
14	14	Displacive polymorphic transformation occurs between: A1 : Tridymite and cristoblite A2 : α–quartz and β-quartz A3 : Kyanite and andalusite A4 : Andalusite and sillimanite	4.0	1.00
Objective Question				
15	15	Which of the following crystals physical properties like hardness, thermal conductivity, electrical resistance etc., do not vary with crystallographic directions? 1) Quartz, 2) Garnet, 3) kyanite, 4) halite, 5) Magnetite, 6) Calcite. A1 : All minerals (1 to 6)	4.0	1.00

		A2 : 2, 4 and 5 A3 : 1, 3 and 6 A4 : 1, 3, 4 and 6		
Objective Question				
16	16	Substitution of trace element for major element in a crystal structure is considered as A1 : Line defect A2 : Plane defect A3 : Point defect A4 : Edge defect	4.0	1.00
Objective Question				
17	17	Powder X-ray diffraction method is most useful for determination of A1 : Trace element abundance in minerals A2 : Point defects in minerals A3 : Space group of crystals A4 : d-spacing between lattice planes	4.0	1.00
Objective Question				
18	18	Systematic absence of peaks in powder X-ray diffraction pattern of a mineral belonging to isometric system indicates that it has A1 : Face centered or body centered lattice A2 : Primitive lattice A3 : Deformed lattice A4 : Twinned lattice	4.0	1.00
Objective Question				
19	19	Consider the elements 1) Sr, 2) Zr,	4.0	1.00

		3) Ba, 4) Th, 5) Nb and 6) Ag. Which of the following lists only high-field strength elements? A1 : 1, 3 and 5 A2 : 2, 4 and 5 A3 : 3, 4 and 6 A4 : 1, 2, 3 and 6		
Objective Question				
20	20	Which class of meteorites closely represents the chemical composition of undifferentiated Earth? A1 : Achondrites A2 : Iron meteorites A3 : Chondrites A4 : Stony-iron meteorites	4.0	1.00
Objective Question				
21	21	Secondary foliation that develops at highest metamorphic grade is known as A1 : Cleavage A2 : Gneissosity A3 : Schistosity A4 : mylonite.	4.0	1.00
Objective Question				
22	22	In S-C structure, the maximum angle between S and C will never exceed A1 : 45^{o} A2 : 35^{o} A3 : 55^{o}	4.0	1.00

		A4 : 25^o		
Objective Question				
23	23	If the angle between two initially orthogonal lines becomes 60^o after simple shear deformation, then the magnitude of shear strain will be A1 : 0.35 A2 : 0.58 A3 : 0.81 A4 : 0.45	4.0	1.00
Objective Question				
24	24	If the net slip of a fault is parallel to the trace of the bedding on the fault plane then A1 : Strike separation is zero A2 : Dip separation is zero A3 : Both strike and dip separations are zero A4 : Strike separation is equal to net slip	4.0	1.00
Objective Question				
25	25	Flower structure is developed in zone of A1 : Transpression A2 : Transtension A3 : Compression A4 : Extension	4.0	1.00
Objective Question				
26	26	*hol*-type joints are example of A1 : Extension fracture joint A2 : Shear fracture joint	4.0	1.00

		A3 : Hybrid fracture joint A4 : Post-tectonic joint.		
Objective Question				
27	27	Fold with straight limb and sharp hinge is known as A1 : Cuspate fold A2 : Chevron fold A3 : Conical fold A4 : Coaxial fold.	4.0	1.00
Objective Question				
28	28	Symplectite texture is a kind of A1 : Relict texture A2 : Reaction texture A3 : Replacement texture A4 : Exsolution texture	4.0	1.00
Objective Question				
29	29	In case of discontinuous reaction, the degree of freedom (F) is A1 : 1 A2 : 0 A3 : 2 A4 : 3	4.0	1.00
Objective Question				
30	30	Exchange reactions are A1 : Not good geothermometer and geobarometer	4.0	1.00

		A2 : Very good geothermometer and geobarometer A3 : Very good geobarometer A4 : Very good geothermometer.		
Objective Question				
31	31	Sharing of _____ between two anion polyhedral in an ionic crystal is the least preferred. A1 : Corners A2 : Edges A3 : Faces A4 : linnes	4.0	1.00
Objective Question				
32	32	A crystal of CdI corresponds to $A^0X_2^h$ structure. What percentage of octahedral coordination sites in this crystal are occupied? A1 : 25% A2 : 50% A3 : 75% A4 : 100%	4.0	1.00
Objective Question				
33	33	If two mirror planes intersect with each other at 45^o, then the point group would be A1 : 2mm A2 : 3mm A3 : 4mm A4 : 6mm	4.0	1.00
Objective Question				
34	34	In which of the crystallographic system/s the (100) plane need not be perpendicular to the *a*-axis.	4.0	1.00

		A1 : Cubic A2 : Orthorhombic A3 : Tetragonal A4 : Triclinic		
Objective Question				
35	35	Which of the following is a pair of enantiomorphic screw axes A1 : $6_1,6_5$ A2 : $6_2,6_3$ A3 : $6_3,6_4$ A4 : $6_2,6_5$	4.0	1.00
Objective Question				
36	36	Which of the following statements is TRUE? A1 : The whole mantle is partially molten A2 : The mantle deeper than 600 km never behaves elastically A3 : The mantle on short time scales, such as during the propagation of seismic waves, behaves elastically, but on long time scales behaves plastically A4 : Magma in mantle gives rise to the global convective cells.	4.0	1.00
Objective Question				
37	37	Which of the following forces are the major driving force for the movement of the plates? A1 : Mantle drag A2 : Slab pull A3 : Mantle plume A4 : Upwelling of the magma at mid-oceanic ridges	4.0	1.00
Objective Question				

38	38	The oldest sample on the Earth is some grains of mineral zircon. This is because A1 : Zircon is the first mineral to form from the magma ocean A2 : Zircon could survive the rock-recycling and reworking A3 : There was nothing formed prior to the crystallization of the zircon A4 : zircon was buried deep during the early period of the Earth and surfaced now.	4.0	1.00
Objective Question				
39	39	Which of the following rocks can be formed from a sedimentary rock? A1 : Garnet-muscovite schist A2 : Basalt A3 : Peridotite A4 : Serpentinite	4.0	1.00
Objective Question				
40	40	Which of the following pairs of the rocks has one sedimentary and one igneous rock, respectively, having a similar chemical and mineralogical composition? A1 : limestone, marble A2 : dolomite, marble A3 : limestone, carbonatite A4 : shale, granite	4.0	1.00
Objective Question				
41	41	The geoid can be best defined as A1 : An oblate spheroid that best approximates shape of the earth A2 : A surface over which the value of gravity is constant A3 : The physical surface of the earth A4 : An equipotential surface of gravity of the earth	4.0	1.00

Objective Question				
42	42	Which one of the following is an image rectification technique? A1 : Histogram equalization A2 : Density slicing A3 : Histogram normalization A4 : Rubber sheeting	4.0	1.00
Objective Question				
43	43	The colour composite image in which vegetation appears red is called A1 : Psuedo colour composite A2 : Standard False Colour Composite A3 : Natural Colour composite A4 : True colour composite	4.0	1.00
Objective Question				
44	44	In a remotely sensed data of a planet, the presence of hydrous species can be inferred using _____region of the electromagnetic spectrum? A1 : Radio wave A2 : Gamma A3 : Infrared A4 : Visible	4.0	1.00
Objective Question				
45	45	Mantle xenoliths are observed in A1 : Kimberlite A2 : Granite A3 : Pegmatite	4.0	1.00

		A4 : Granulite		
Objective Question				
46	46	Among the following, which filter will remove the sun-glint effect from remotely sensed data? A1 : Band-pass filtering A2 : Low-pass filtering A3 : High-pass filtering A4 : Polarising filters	4.0	1.00
Objective Question				
47	47	Aerial photograph which is corrected for all kind of errors, including distortion due to terrain elevation is A1 : Vertical aerial photograph A2 : Tilted photograph A3 : Ortho Photo A4 : rectified photo	4.0	1.00
Objective Question				
48	48	Which instrument can help in determining the height of the object from a stereo pair images? A1 : Pocket stereoscope A2 : Parallax bar A3 : mirror stereoscope A4 : telescope	4.0	1.00
Objective Question				
49	49	An object appears yellow colour in standard FCC. Which of the can following statement is correct? A1 : The object reflects equally high in blue and green bands; low reflection in red band A2 : The object reflects equally high in IR and red bands; low reflection in green band	4.0	1.00

		A3 : The object reflects equally high in red and green bands; low reflection in blue band A4 : The object reflects equally high in red and green bands; low reflection in IR band		
Objective Question				
50	50	Which wavelength region can be used to remote sensing of the earth during a thunder storm? A1 : Visible A2 : IR A3 : TIR A4 : Microwave	4.0	1.00
Objective Question				
51	51	Which of the following is the oldest magmatic epoch? A1 : Brunhes normal A2 : Matayama reversed A3 : Gauss normal A4 : Gilbert reversed	4.0	1.00
Objective Question				
52	52	The Mediterranean, Black, Caspian and Aral Seas - all are remnants of A1 : Avalonia A2 : Gondwana A3 : Tethys A4 : Laurasia	4.0	1.00
Objective Question				
53	53	Which of the following system was established later than the others in the group? A1 : Cambrian A2 Ordovician	4.0	1.00

		: A3 : Silurian A4 : Devonian		
Objective Question				
54	54	Choose the set which belong to the same age A1 : Panchet-Pachmarhi-Kamthi-Bijori A2 : Suprapanchet - Dubrajpur -Parsora-Dharmaram A3 : Jabalpur-Chikiala-Parsora-Dubrajpur A4 : Barakar-Motur-Bijori-Kamthi	4.0	1.00
Objective Question				
55	55	Marine Cretaceous rocks of Narmada Valley is grouped as _____ Formation. A1 : Bagh A2 : Lameta A3 : Chikkim A4 : Giumal	4.0	1.00
Objective Question				
56	56	Ages Lutetian, Ypresian and Barterian belongs to A1 : Cambrian A2 : Eocene A3 : Triassic A4 : Proterozoic	4.0	1.00
Objective Question				
57	57	In Kumaon region, the youngest Paleozoic formation is described as _____ Formation. A1 : Garbyang	4.0	1.00

		A2 : Zewan A3 : Kali A4 : Kringkrong		
Objective Question				
58	58	Different formations (flows) of Deccan Traps are separated by A1 : Giant Plagioclase basalt A2 : Slices of Ophiolite A3 : Compound flow A4 : Simple flow	4.0	1.00
Objective Question				
59	59	‘Law of faunal succession’ was proposed by A1 : William Smith A2 : James Hutton A3 : A. d’Orbingy A4 : Carl von Linnaeus	4.0	1.00
Objective Question				
60	60	Which of the following is the correct sequence of Indian Geological Time Scale A1 : Archaean – Purana – Aryan – Dravidian Groups A2 : Archaean – Purana – Dravidian – Aryan Groups A3 : Archaean – Aryan – Purana – Dravidian Groups A4 : Archaean – Dravidian – Aryan – Purana Groups	4.0	1.00
Objective Question				
61	61	Influent streams are	4.0	1.00

		A1 : More common in arid regions A2 : More common in humid regions A3 : Only found in areas of permafrost A4 : Sink hole		
Objective Question				
62	62	The log used to measure the diameter of the bore hole is known as: A1 : Dip meter log A2 : Sonic log A3 : Temperature log A4 : Caliper log	4.0	1.00
Objective Question				
63	63	The volume of water than an aquifer releases or takes into storage per unit surface area of aquifer per unit change in the component of head normal to that surface is A1 : Storage coefficient A2 : Transmissivity A3 : Specific yield A4 : Specific capacity	4.0	1.00
Objective Question				
64	64	Which of the following zone lies just below the groundwater table A1 : Leaching zone A2 : Oxidation zone A3 : Supergene enrichment zone A4 : Hypogene zone	4.0	1.00

Objective Question				
65	65	A land is known as waterlogged A1 : When the permanent wilting point is reached A2 : When gravity drainage has ceased A3 : Capillary fringe reaches the root zone of plants A4 : When runoff increases	4.0	1.00
Objective Question				
66	66	Which zone of the ocean extends from the low tide line to the edge of the continental shelf? A1 : Neritic zone A2 : Open ocean zone A3 : Intertidal zone A4 : Abyssal zone	4.0	1.00
Objective Question				
67	67	The change in the groundwater head per unit distance is A1 : The hydraulic gradient. A2 : The equipotential gradient. A3 : The flow gradient. A4 : The Hydraulic head.	4.0	1.00
Objective Question				
68	68	Which of the following rocks has the highest permeability? A1 : Un-fractured shale A2 : Cemented sandstone A3 : Un-cemented sandstone A4 Variegated Clay	4.0	1.00

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Objective Question				
69	69	The measure of the amount of water that can be transmitted horizontally through a unit width by the full saturated thickness of the aquifer under a hydraulic gradient of 1 is known as A1 : Transmissivity A2 : Storativity A3 : Permeability A4 : Porosity	4.0	1.00
Objective Question				
70	70	The acronym "NAPL" used to describe the organic liquids like hydrocarbon fuels/solvents spilled into the water is A1 : Non aqueous phase liquid A2 : Non aromatic phase liquid A3 : Sodium phase liquid A4 : Non aqueous planar liquid.	4.0	1.00
Objective Question				
71	71	One of the following types of ore deposits is formed on the sea floor. A1 : sedimentary exhalative A2 : carbonate-hosted Pb-Zn A3 : sandstone type U A4 : unconformity type U	4.0	1.00
Objective Question				
72	72	What is common to Nausahi ultramafic complex and Sittampundi anorthosite complex? A1 : Nickel sulphide & PGE A2 : Chromite & PGE A3 Chromite & Nickel sulphide	4.0	1.00

		: A4 : Nickel sulphide		
Objective Question				
73	73	Choose the odd pair of primary and secondary copper minerals. A1 : Chalcopyrire - chalcocite A2 : Chalcopyrite – covellite A3 : Chalcopyrite – cubanite A4 : Chalcopyrite – malachite	4.0	1.00
Objective Question				
74	74	Homogenisation temperature of primary fluid inclusions in a mineral gives the A1 : Lower limit of temperature of crystallization of the mineral A2 : Upper limit of temperature of crystallization of the mineral A3 : Temperature of crystallization of the mineral A4 : Pressure during crystallization of the mineral	4.0	1.00
Objective Question				
75	75	Identify the wrong pair of host rock and associated ore mineral. A1 : Granite pegmatite – psilomelane A2 : Komatiite – pentlandite A3 : Lamproite – diamond A4 : Skarn – scheelite	4.0	1.00
Objective Question				
76	76	One of the following is the common host for ore deposits of REE. A1 : Sedimentary carbonate formation A2 : Carbonatite	4.0	1.00

		A3 : Komatiite A4 : Kimberlite		
Objective Question				
77	77	In one of the following list, manganese ore minerals are correctly arranged in order of increase in temperature of crystallization. A1 : Bixbyite – hausmaanite – pyrolusite A2 : Hausmannite – pyrolusite – bixbyite A3 : Pyrolusite – bixbyite – hausmannite A4 : Pyrolusite – hausmannite – bixbyite	4.0	1.00
Objective Question				
78	78	Evaporite bed is known from one of the following Proterozoic sedimentary basins. A1 : Cuddapah A2 : Vindhyan A3 : Marwar A4 : Bhima	4.0	1.00
Objective Question				
79	79	Carbonate formations of Aravalli Supergroup host large deposits of A1 : Cu and Pb-Zn A2 : Pb-Zn A3 : Pb-Zn and phosphorite A4 : phosphorite	4.0	1.00
Objective Question				
80	80	Boiling, mixing of fluids and fluid-rock interaction are the important processes responsible for A1 : Leaching of metal from source rock	4.0	1.00

		A2 : Transport of metal by a fluid phase A3 : Deposition of ore from a hydrothermal fluid A4 : Dispersion of metal in a rock		
Objective Question				
81	81	A basic assumption in the interpretation of fluid inclusions is that these are A1 : Isochoric A2 : Isobaric A3 : Isothermal A4 : isochemical	4.0	1.00
Objective Question				
82	82	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. A1 : Skarn tungsten A2 : Greisen tungsten A3 : Porphyry copper A4 : Hydrothermal uranium	4.0	1.00
Objective Question				
83	83	Uranium deposit types are correctly arranged in decreasing order of age (that is old to young) in one of the following. A1 : QPC – Unconformity – Sandstone A2 : Unconformity – QPC – Sandstone A3 : Sandstone – Unconformity – QPC A4 : Unconformity – Sandstone – QPC	4.0	1.00
Objective Question				
84	84	The discontinuity which represents the boundary between crust and mantle is termed	4.0	1.00

		A1 : Moho A2 : Conrad A3 : Gutenberg A4 : Lehman		
Objective Question				
85	85	Benioff zone is the name given to A1 : Sub ducting plate A2 : Mid ocean ridges A3 : Transform faults A4 : Mountains	4.0	1.00
Objective Question				
86	86	The transfer of heat by the physical movement of material is called A1 : Conduction A2 : Convection A3 : Radiation A4 : Scattering	4.0	1.00
Objective Question				
87	87	Magnetic material having negative magnetic susceptibility is termed A1 : Ferromagnetic A2 : Paramagnetic A3 : Diamagnetic A4 : Super paramagnetic	4.0	1.00

Objective Question				
88	88	Himalayan mountains have formed primarily as a result of A1 : Compressive deformation between Indian and Asian tectonic plates A2 : Relative uplift of sediments in the Tethys Ocean in an extensional setting A3 : Strike- slip deformation between Indian and Eurasian plates. A4 : Extrusion of volcanic material over a long period of time on the Tethys ocean floor	4.0	1.00
Objective Question				
89	89	The average density of the earth is A1 : 3.5 g/cm^3 A2 : 4.5 g/cm^3 A3 : 5.5 g/cm^3 A4 : 6.5 g/cm^3	4.0	1.00
Objective Question				
90	90	The principle of continents being in buoyant equilibrium is known as A1 : Isostasy A2 : The principle of buoyant equilibrium A3 : Elastic rebound theory A4 : None of these	4.0	1.00
Objective Question				
91	91	The value of Gravity becomes zero at A1 : the surface of the earth A2 : the centre of the earth A3 : equator A4 poles	4.0	1.00

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Objective Question				
92	92	Natural earthquakes are generated due to A1 : Plastic flow of rocks and release of plastic strain energy A2 : Folding of rock layers A3 : Sudden release of elastic strain energy during fracture propagation A4 : Sudden release of viscous strain accumulated in rocks.	4.0	1.00
Objective Question				
93	93	The largest Planet in the solar system is A1 : Earth A2 : Mars A3 : Jupiter A4 : Saturn	4.0	1.00
Objective Question				
94	94	In which of the following sedimentary environments would you expect the sand deposits to be poorly sorted? A1 : Alluvial A2 : Beach A3 : Desert A4 : Glacial	4.0	1.00
Objective Question				
95	95	Which of the following environments is an example of a shoreline/transitional environment? A1 : Alluvial A2 : continental shelf A3 : deltaic	4.0	1.00

		A4 : organic reef		
Objective Question				
96	96	Coarse clastic material can be transported into a deep marine environment by A1 : Rivers A2 : Wind A3 : Turbidity currents A4 : All of these	4.0	1.00
Objective Question				
97	97	Marine sediments deposited in water depths greater than about 12,000 feet usually lack A1 : Carbonate shells A2 : Silica-rich shells A3 : Fine grained material transported by the wind A4 : All of these	4.0	1.00
Objective Question				
98	98	In which of the following environments would you expect to find oscillation ripples? A1 : Alluvial A2 : Beach A3 : Deep-sea A4 : Desert	4.0	1.00
Objective Question				
99	99	Which of the following sedimentary environments is dominated by waves and tidal currents? A1 : Glacial A2 : Alluvial fans	4.0	1.00

		A3 : Deltaic A4 : Deep marine		
Objective Question				
100	100	Climbing ripple cross laminations form during migration of ripples under conditions of A1 : Starved sediment supply in streams A2 : Starved sediment supply at beach A3 : Surplus sediment supply in streams A4 : Surplus sediment supply at beach	4.0	1.00