DU MPhil PhD in Geology

Topic:- GEO MPHIL

1) In ocean water column 'the zone of partial dissolution' is confined between[Question ID = 3472]
1. Calcite lysocline and calcite compensation depth (CCD) [Option ID = 13885]
2. Aragonite lysocline and calcite lysocline [Option ID = 13886]
3. Aragonite lysocline and aragonite compensation depth (ACD) [Option ID = 13887]
4. Aragonite lysocline and calcite compensation depth (CCD) [Option ID = 13888]

2) A sandstone dominantly composed of volcanic lithic fragment and plagioclase feldspar with very rare quartz. The sandstone is likely to be from[Question ID = 3473]
1. Continental block provenance [Option ID = 13889]
2. Riftogenic provenance [Option ID = 13890]
3. Recycled orogen provenance [Option ID = 13891]
4. Magmatic arc provenance [Option ID = 13892]

3) In terms of decreasing stability of carbonate minerals, they can be arranged as

[Question ID = 3474]
1. Aragonite > Mg calcite with more than 12 mole % $MgCO_3$> Mg calcite with < 7% mole % $MgCO_3$

   [Option ID = 13893]
2. Mg calcite with more than 12 mole % $MgCO_3$ = Aragonite > Mg calcite with < 7% mole % $MgCO_3$

   [Option ID = 13894]
3. Mg calcite with more than 12 mole % $MgCO_3$ = Aragonite < Mg calcite with < 7% mole % $MgCO_3$

   [Option ID = 13895]
4. Mg calcite with < 7% mole % $MgCO_3$> Mg calcite with more than 12 mole % $MgCO_3$ = Aragonite

   [Option ID = 13896]

4) The following is a interbed soft sediment deformation structure[Question ID = 3475]
1. Overturned cross-stratification [Option ID = 13897]
2. Load structure [Option ID = 13898]
3. Convolute lamination [Option ID = 13899]
4. Dish and Pillar structure [Option ID = 13900]

5) We call a shelf tide-dominated, when tidal current velocity is[Question ID = 3476]
1. More than 20cm/sec [Option ID = 13901]
2. More than 2m/sec [Option ID = 13902]
3. From about 50 to more than 150cm/sec [Option ID = 13903]
4. From about 10 to 40cm/sec [Option ID = 13904]

6) We assign magnetic polarity as normal when[Question ID = 3477]
1. There is negative inclination in northern hemisphere [Option ID = 13905]
2. There is negative inclination in southern hemisphere [Option ID = 13906]
3. There is positive inclination in northern hemisphere [Option ID = 13907]
4. There is no declination [Option ID = 13908]

7) Isolated narrow channel deposits encased within overbank fines are most likely in alluvial valleys with[Question ID = 3478]
1. Less frequent avulsion and slow subsidence [Option ID = 13909]
2. Less frequent avulsion [Option ID = 13910]
3. Frequent avulsion and fast subsidence [Option ID = 13911]
4. More lateral migration [Option ID = 13912]

8) Microscopic spiny structures made of organic material that help as a biostratigraphic tool in Precambrian strata are[Question ID = 3479]
1. Diatoms [Option ID = 13913]
2. Conodonts [Option ID = 13914]
3. Acritarchs [Option ID = 13915]
4. Coccoliths [Option ID = 13916]

9) A good hydrocarbon source rock should contain[Question ID = 3480]
1. High total organic carbon (TOC), humic organic matter, low H/C ratio and high O/C ratio [Option ID = 13917]
2. Low total organic carbon (TOC), sapropelic organic matter, low H/C and low O/C ratio [Option ID = 13918]
3. High total organic matter (TOC), sapropelic organic matter, high H/C and low O/C [Option ID = 13919]
4. High total organic matter (TOC), humic organic matter, high H/C and low O/C [Option ID = 13920]

10) Lipak Formation of Zanskar is coeval to _____ Formation of Kashmir.[Question ID = 3481]

1. Fenestella Shale [Option ID = 13921]
2. Syringothyris Limestone [Option ID = 13922]
3. Zewan Formation [Option ID = 13923]
4. Mammal Formation [Option ID = 13924]

11) In India, the change from glacial to non-glacial conditions during the Permo-Carboniferous time led to the diversification of[Question ID = 3482]
1. Ptilophyllum Flora [Option ID = 13925]
2. Thinnfeldia Flora [Option ID = 13926]
3. Gangamopteris Flora [Option ID = 13927]
4. Glossopteris Flora [Option ID = 13928]

12) Present day reefs are mainly present[Question ID = 3483]
1. In tropical seas up to 35^0 latitude on either side of equator [Option ID = 13929]
2. In temperate seas up to 60^0 latitude on either side of equator [Option ID = 13930]
3. In equator only [Option ID = 13931]
4. Close to the poles only [Option ID = 13932]

13) In a given period of time if a sedimentary section is thinly formed compared to other contemporaneous sedimentary sections, we refer to that thin sedimentary section as a/an[Question ID = 3484]
1. Type section [Option ID = 13933]
2. Condensed section [Option ID = 13934]
3. Unmatched section [Option ID = 13935]
4. Better section [Option ID = 13936]

14) At times of deglaciation[Question ID = 3485]
1. $\delta^{18}O$ increases in seawater [Option ID = 13937]
2. $\delta^{18}O$ decreases in seawater [Option ID = 13938]
3. $\delta^{16}O$ increases in seawater [Option ID = 13939]
4. $\delta^{16}O$ decreases in seawater [Option ID = 13940]

15) The chronostratigraphic equivalent of 'Epoch' is[Question ID = 3486]
1. 'Stage' [Option ID = 13941]
2. 'Chron' [Option ID = 13942]
3. 'Series' [Option ID = 13943]
4. 'System' [Option ID = 13944]

16) Hyaloclastites are

[Question ID = 3487]
1. Pyroclastic fall deposits

   [Option ID = 13945]
2. Non-explosive hydrovolcanic autoclastic deposits

   [Option ID = 13946]
3. Explosive subaerial pyroclastic deposit

   [Option ID = 13947]
4. Incandescent subaqueous pyroclastic surge deposit

   [Option ID = 13948]

17) In trilobites the segments of the thorax and the pygidium can be differentiated by[Question ID = 3488]
1. Their shape and size [Option ID = 13949]
2. Their movable and immovable character [Option ID = 13950]
3. The nature of the furrows [Option ID = 13951]
4. The total number of segments [Option ID = 13952]

18) Match List I with List II

List I	List II
A. Bounded between basal surface of forced regression and correlative conformity	I. Transgressive systems tract
B. Bounded between maximum flooding surface and basal surface of forced regression	II. Forced regressive systems tract
C. Bounded between correlative conformity and transgressive surface	III. Highstand systems tract
D. Bounded between transgressive surface and maximum flooding surface	IV. Lowstand systems tract

Choose the correct answer from the options given below:

[Question ID = 3489]
1. A - I , B - II , C - III , D - IV [Option ID = 13953]
2. A - III , B - IV , C - I , D - II [Option ID = 13954]
3. A - II , B - III , C - IV , D - I [Option ID = 13955]
4. A - IV , B - II , C - III , D - I [Option ID = 13956]

19) We get 'Ravinement deposit' in association with

[Question ID = 3490]

1. Unconformity surface

   [Option ID = 13957]
2. Maximum flooding surface

   [Option ID = 13958]
3. Transgressive surface

   [Option ID = 13959]
4. In any one of these

   [Option ID = 13960]

20) The transformation of feldspar to kaolinitic clay is a weathering profile is a[Question ID = 3491]
1. Hydration reaction only [Option ID = 13961]
2. Decarboxylation reaction only [Option ID = 13962]
3. Combination of hydration and decarboxylation [Option ID = 13963]
4. Combination of hydration and carbonation [Option ID = 13964]

21) Name the missing product in the following reaction: 3 Anorthite = 2 Kyanite +...... + Quartz[Question ID = 3492]
1. Grossularite [Option ID = 13965]
2. Labradorite [Option ID = 13966]
3. Wollastonite [Option ID = 13967]
4. Diopside [Option ID = 13968]

22) In the Hermann-Mauguim System of notations if we add mirror planes perpendicular to each of the rotation axes of 422 the resulting crystal class is

[Question ID = 3493]
1. $4/m2/m2/m$ which falls in Cubic system

   [Option ID = 13969]
2. $4/m2/m2/m$ which falls in Tetragonal system

   [Option ID = 13970]
3. $4mm$ which falls in Tetragonal system

   [Option ID = 13971]
4. $4/m$ which falls in Tetragonal system

   [Option ID = 13972]

23) The silica content in alkali syenites is lower than in other syenites because the former contains[Question ID = 3494]
1. Low amount of quartz [Option ID = 13973]
2. Large amount of anorthitic plagioclase [Option ID = 13974]
3. Significant amount of felspathoids [Option ID = 13975]
4. Large amount of olivine [Option ID = 13976]

24) Vitrinite reflectance[Question ID = 3495]
1. Increases with rank of coal [Option ID = 13977]
2. Decreases with rank of coal [Option ID = 13978]
3. Increases with grade of coal [Option ID = 13979]
4. Decreases with grade of coal [Option ID = 13980]

25) The chemical composition of Lepidolite is[Question ID = 3496]
1. $LiAlSi_2O_6$ [Option ID = 13981]
2. $KLi_2AlSi_4O_{10}(OH)_2$ [Option ID = 13982]
3. $LiAlSiO_4$ [Option ID = 13983]
4. $NaLi_2AlSi_4O_{10}(OH)_2$ [Option ID = 13984]

26) The diagnostic assemblage of granulite facies in metabasites is[Question ID = 3497]
1. Clinopyroxene-plagioclase-epidote [Option ID = 13985]
2. Clinopyroxene-plagioclase and hornblende [Option ID = 13986]
3. Clinopyroxene-hornblende-epidote [Option ID = 13987]
4. Clinopyroxene-orthopyroxene-plagioclase [Option ID = 13988]

27) Ore minerals generally associated with chalcopyrite deposits are[Question ID = 3498]
1. Bornite, cuprite, covellite [Option ID = 13989]
2. Mica, columbite, cassiterite [Option ID = 13990]
3. Bauxite, limonite, goethite [Option ID = 13991]
4. Hematite, magnetite and siderite [Option ID = 13992]

28) If the decay constant of an isotope is 1.55125×10^{-10}/y then its half-life is[Question ID = 3499]
1. 8.21×10^9 yrs [Option ID = 13993]
2. 2.47×10^5 yrs [Option ID = 13994]
3. 4.46×10^9 yrs [Option ID = 13995]
4. 5.45×10^9 yrs [Option ID = 13996]

29) Match List I with List II

List I	List II
A. Lapsaburu	I. Barite-Asbestos
B. Pulivendla	II. Lead -Zinc
C. Malanjkhand	III. Kyanite
D. Ambaji - Deri	IV. Copper-Molybdenum

Choose the correct answer from the options given below:

[Question ID = 3500]
1. A - III , B - I , C - IV , D - II [Option ID = 13997]
2. A - IV , B - I , C - II , D - III [Option ID = 13998]
3. A - IV , B - III , C - I , D - II [Option ID = 13999]
4. A - II , B - I , C - III , D - IV [Option ID = 14000]

30) Based on the IUGS system of igneous classification, match the rock types (List I) with the percent of mineral (List II)

List I	List II
A. Harzburgite	I. 10% Olivine, 50% Orthopyroxene, 40% Clinopyroxene
B. Websterite	II. 60% Olivine, 30% Orthopyroxene, 10% Clinopyroxene
C. Wehrlite	III. 60% Olivine, 15% Orthopyroxene, 25% Clinopyroxene
D. Lherzolite	IV. 60% Olivine, 10% Orthopyroxene, 30% Clinopyroxene

Choose the correct answer from the options given below:

[Question ID = 3501]
1. A - II , B - I , C - IV , D - III [Option ID = 14001]
2. A - II , B - I , C - III , D - IV [Option ID = 14002]
3. A - I , B - II , C - IV , D - III [Option ID = 14003]
4. A - IV, B - III , C - I , D - II [Option ID = 14004]

31) At 10 meter towards land from average coastline, the depth to fresh/saline interface in groundwater is 40 m below mean sea level. Assuming hydraulic conductivity to be 20 m/day, and given that the density of fresh water is 1.0 gram/cm^3 and density of saline water is 1.025 gram/cm^3, the Darcy velocity can be estimated as:[Question ID = 3502]
1. 4 m/day [Option ID = 14005]
2. 1 m/day [Option ID = 14006]
3. 3 m/day [Option ID = 14007]
4. 2 m/day [Option ID = 14008]

32) In case of direct rotary drilling, if it is suspected that drilling fluid bentonite clay has invaded the formation, the useful borehole geophysical logging information would be from:[Question ID = 3503]
1. Long and Short normal borehole resistivity log [Option ID = 14009]
2. Fluid-velocity log [Option ID = 14010]
3. Sonic log [Option ID = 14011]
4. Drill time log [Option ID = 14012]

33) During groundwater pumping through a tubewell at a high discharge, the drawdown observed inside the tubewell :
[Question ID = 3504]
1. Is generally less than the expected drawdown in the aquifer [Option ID = 14013]
2. Is generally same as expected drawdown in the aquifer [Option ID = 14014]
3. Is generally more than the expected drawdown in the aquifer [Option ID = 14015]
4. Is much less than the expected drawdown in the aquifer [Option ID = 14016]

34) For steady flow through an unconfined aquifer resting on a horizontal impervious surface, the imaginary water table line in a regional cross section, through unit width of the aquifer is likely to be:[Question ID = 3505]
1. Straight [Option ID = 14017]
2. Parabolic [Option ID = 14018]
3. Hyperbolic [Option ID = 14019]
4. Circular [Option ID = 14020]

35) The rock properties that influence drillability of a rock for an engineering project:[Question ID = 3506]
1. Includes Colour, lustre, hardness and grain size [Option ID = 14021]
2. Includes lustre, hardness, grain size and colour [Option ID = 14022]
3. Includes abrasiveness, discontinuities, colour and lustre [Option ID = 14023]
4. Includes hardness, abrasiveness, grain size and discontinuities [Option ID = 14024]

36) $$\frac{\partial^2 h}{\partial x^2} + \frac{\partial^2 h}{\partial y^2} + \frac{\partial^2 h}{\partial z^2} = 0$$

Above is the general equation for three dimensional groundwater flow under equilibrium condition through:

A. Heterogeneous and anisotropic media.

B. Homogeneous and isotropic media.

1. A alone

    [Option ID = 14025]
2. B alone

    [Option ID = 14026]
3. Both A and B

    [Option ID = 14027]
4. Neither A nor B

    [Option ID = 14028]

37) Darcy's law can be used for quantifying groundwater flow in an unconfined aquifer by assuming that the Water table top is:

A. parabolic in nature

B. the groundwater flow is partially curvilinear in nature

[Question ID = 3508]

1. A alone

    [Option ID = 14029]
2. B alone

    [Option ID = 14030]
3. Both A and B

    [Option ID = 14031]
4. Neither A nor B

    [Option ID = 14032]

38) S-C fabrics are one of the most useful sense of shear indicators in a ductile shear zone. They consist of:

A. foliation planes called as S-surfaces and

B. shear bands denoted as C-surfaces

[Question ID = 3509]

1. A alone

    [Option ID = 14033]
2. B alone

    [Option ID = 14034]
3. Both A and B

    [Option ID = 14035]
4. Neither A nor B

    [Option ID = 14036]

39) In general, the cleavage plains cut bedding discordantly and is commonly penetrative at:

A. outcrop scale

B. microscopic scale

[Question ID = 3510]

1. A is true but B is false

    [Option ID = 14037]
2. B is true but A is false

    [Option ID = 14038]
3. Both A and B are true

    [Option ID = 14039]
4. Neither A nor B is true

    [Option ID = 14040]

40) Pseudotachylite is:

A. A frozen small volume of rock melt generated by frictional heating during seismic slip along a fault

B. A basaltic volcanic glass

[Question ID = 3511]

1. A alone

    [Option ID = 14041]
2. B alone

    [Option ID = 14042]
3. Both A and B

41) Solifluction involves:

A. Slow and continuous movement over the whole slope

B. Movement, that is not continuous over the whole slope

[Question ID = 3512]

1. A alone

[Option ID = 14045]

2. B alone

[Option ID = 14046]

3. Both A and B

[Option ID = 14047]

4. Neither A nor B

[Option ID = 14048]

42) The shear strength of a rock mass and its deformability are influenced

A. By the pattern and geometry of the discontinuity

B. By the level of development of the discontinuity

[Question ID = 3513]

1. A alone

[Option ID = 14049]

2. B alone

[Option ID = 14050]

3. Both A and B

[Option ID = 14051]

4. Neither A nor B

[Option ID = 14052]

43) The rock quality designation (RQD), is

A. Based on the percentage core recovery during drilling of the rocks with NX (57.2 mm) or larger-diameter diamond-core drills.

B. The sum of the core sticks in excess of 100 mm, expressed as a percentage of the total length of core drilled.

[Question ID = 3514]

1. A alone

[Option ID = 14053]

2. B alone

[Option ID = 14054]

3. Both A and B

[Option ID = 14055]

4. Neither A nor B

[Option ID = 14056]

44) The amount of overbreak during tunneling generally depends on:

A. Rock types, discontinuities and the excavation method

B. The specific capacity of the aquifer material

[Question ID = 3515]

1. A alone

[Option ID = 14057]

2. B alone

[Option ID = 14058]

3. Both A and B

[Option ID = 14059]

4. Neither A nor B

[Option ID = 14060]

45) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: The brittle and ductile character of a shear zone may change with depth.

Reason R: With depth, rheology of the rocks change in response to pressure, temperature, and strain rate.

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 3516]

1. Both A and R are correct and R is the correct explanation of A

   [Option ID = 14061]
2. Both A and R are correct but R is NOT the correct explanation of A

   [Option ID = 14062]
3. A is correct but R is not correct

   [Option ID = 14063]
4. A is not correct but R is correct

   [Option ID = 14064]

46) The specific yield of an aquifer:[Question ID = 3517]
1. May be more than porosity of the aquifer [Option ID = 14065]
2. May be less than porosity of the aquifer [Option ID = 14066]
3. May be equal to porosity of the aquifer [Option ID = 14067]
4. Is in no way controlled by porosity of the aquifer [Option ID = 14068]

47) The stable isotope concentration for the hydrological study are measured:

A. As a ratio of the rare to the abundant isotope and expressed as the difference in this ratio between the sample and a known reference.

B. As a ratio of the abundant to the rare isotope and expressed as the difference in this ratio between the sample and a known reference.

[Question ID = 3518]

1. A alone

   [Option ID = 14069]
2. B alone

   [Option ID = 14070]
3. Both A and B

   [Option ID = 14071]
4. Neither A nor B

   [Option ID = 14072]

48) The slickenline orientations on a given fault are defined by the intersection of the fault surface with the:[Question ID = 3519]
1. Plane formed by the σ_1/σ_2 principal stress axes [Option ID = 14073]
2. Plane formed by the σ_2/σ_3 principal stress axes [Option ID = 14074]
3. Plane formed by the σ_3/σ_2 principal stress axes [Option ID = 14075]
4. Plane formed by the σ_1/σ_3 principal stress axes [Option ID = 14076]

49) At or near the surface of the earth, mostly the normal faults form when:

A. The direction of the greatest principal stress axis (σ_1) is vertical

B. The direction of the intermediate principal stress axis (σ_2) is horizontal

[Question ID = 3520]

1. A is true but B is false

   [Option ID = 14077]
2. B is true but A is false

   [Option ID = 14078]
3. Both A and B are true

   [Option ID = 14079]
4. Neither A nor B is true

   [Option ID = 14080]

50) For estimation of the Unconfined Compressive Strength (UCS) of rocks, the rock specimen is loaded:[Question ID = 3521]
1. Along their transverse axis with lateral restraint [Option ID = 14081]
2. Along their longitudinal axis without lateral restraint [Option ID = 14082]
3. Along their longitudinal axis with lateral restraint [Option ID = 14083]
4. Along their transverse axis without lateral restraint [Option ID = 14084]