

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA, VADODARA

Ph. D. ENTRANCE TEST (PET) – 27th January 2019

Signature of Invigilators

Geology
(19/27)

Roll No.

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(in figures as in Hall Ticket)

Roll No. _____

(in words)

Maximum Marks: 50

No. Of Printed Pages : 8

Instruction for the Candidate:

1. Write your Roll Number in the space provided on the top of this page.
2. This paper consists of **FIFTY (50)** multiple choice type questions. Each Question carries **ONE (1)** mark.
3. At the commencement of examination, the question booklet will be given to you. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as below:
 - a. To have access to the Question Booklet, tear off the paper seal on the edge of this cover page, Do not accept a booklet without sticker seal and do not accept an open booklet.
 - b. Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faculty booklets due to pages/questions missing or duplicate or not in serial order or any other discrepancy should be got replaced immediately by a correct booklet from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given.
 - c. After this verification is over, the Test Booklet Number should be entered on the OMR Answer Sheet and the OMR Answer Sheet Number should be entered on this Test Booklet.
4. Each item has four alternative responses marked (A), (B), (C) and (D). You have to darken the circle as indicated below on the correct response against each item.

Example: (A) ● (C) (D) where (B) is correct response.
5. Your responses to the items are to be indicated on the OMR Answer Sheet under Paper – II only. If you mark your response at any place other than in the circle in the OMR Answer Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done in the end of this booklet.
8. If you write your Name, Roll Number, Phone Number or put any mark on any part of the OMR Answer Sheet, except for the space allotted for the relevant entries, which may disclose your identity, or use abusive language or employ any other unfair means, such as change of response by scratching or using white fluid, you will render yourself liable to disqualification.
9. You have to return the original OMR Answer Sheet to the invigilator at the end of the examination compulsorily and must not carry it with you outside the Examination Hall. You are however, allowed to carry original question booklet and duplicate copy of OMR Answer Sheet on conclusion of examination
10. Use only Blue/ Black Ball point pen.
11. Use of any calculator or log table etc., is prohibited.
12. There shall be no negative marking.

Geology

(19/27)

Note: This paper contains **FIFTY (50)** multiple-choice questions. Each Question carries **ONE (1)** mark.

- 01) Which mineral amongst the following is most resistant to weathering?
A) Serpentine
B) Chlorite
C) Orthoclase feldspar
D) Plagioclase feldspar
- 02) Theory of climate change which is based on a premise that the alternating cold and warm periods of the Quaternary age were due to change in earth's orbit around the Sun is known as _____ theory.
A) Milankovich
B) Kearey
C) Orbital
D) Dawson
- 03) The devastating Indonesian tsunami that occurred on 22 December 2004 was triggered by a _____.
A) Volcano
B) Submarine earthquake
C) Submarine slide
D) None of the above
- 04) Which of the following polarity epochs are characterized by normal polarity?
A) Matuyama
B) Gilbert
C) Gauss
D) Jaramillo
- 05) A _____ is a short period of non-deposition.
A) Unconformity
B) Nonconformity
C) Diastem
D) None of the above
- 06) The youngest time period of Precambrian era is _____.
A) Ediacaran
B) Neoproterozoic
C) Mesoproterozoic
D) Palaeoproterozoic
- 07) Which of the following sets of conditions are true for a glacial period?
A) Static sea level
B) Increased aeolian activity
C) High precipitation
D) Increased frequency of extreme climatic fluctuations
- 08) _____ Formation belongs to Kanawar Group of Palaeozoic succession of Spiti.
A) Lipak
B) Zewan
C) Boulder bed
D) Boka bit
- 09) Which of the following plates is the last one to separate from the Indian plate?
A) Seychelles
B) Madagascar
C) Africa
D) Arabia
- 10) Which of the following meteorite impact crater is of Precambrian age?
A) Chicxulub
B) Vredefort
C) Popigai
D) Morokweng
- 11) Steady state geothermal gradient is highly influenced by heat sources attributed to _____.
A) Increase in depth
B) Zone melting
C) Mantle upwelling
D) Decay of radiogenic elements
- 12) Which of the following forms main tectonic setting of volcanism on the earth?
A) Divergent boundary (Decompression melting)
B) Convergent boundary (Flux melting)
C) Mantle plumes (Decompression melting)
D) All of the above

- 13) _____ is the property that controls the rise of temperature in a rock that in turn controls petrological processes.
- Thermal conductivity
 - Thermal diffusivity
 - Thermal compressibility
 - Heat capacity
- 14) _____ is the typical example of diatreme type of intrusion in crustal rocks.
- Ophiolite
 - Monchiquite
 - Kimberlite
 - Dunite
- 15) _____ is a typical example of binary system with congruently melting binary phase.
- Diopside-Anorthite
 - Albite-Anorthite
 - Nepheline-Silica
 - Forsterite-Silica
- 16) Which of the following conditions is the correct pair of resulting metamorphic facies?
- Moderate pressure + low temperature – Eclogite facies
 - High pressure + low temperature – Greenschist facies
 - Highest temperature + high pressure – Granulite facies
 - High temperature + high pressure – Blueschist facies
- 17) Pure calcite shows rhombohedral faces. High Mg-calcite would prominently show _____.
- Prism faces
 - Pinacoid faces
 - Scaleno-hedral faces
 - Pyramid faces
- 18) Which of the following methods is used to date the youngest sediments of the earth?
- Radiocarbon dating
 - Uranium Thorium dating
 - Argon-Argon dating
 - Potassium Argon dating
- 19) The oldest Zircon crystals dated so far, date back to
- Older than 1 billion years BP
 - Older than 2 billion years BP
 - Older than 3 billion years BP
 - Older than 4 billion years BP
- 20) Critical analysis and reconstruction of geometry of folds can be done by
- Measuring the strike and dip of various strata exposed
 - Measuring only dips of strata exposed
 - Measuring any deformational structures within the rocks
 - All of the above
- 21) Sedimentary basins may be formed by crustal thinning as a consequence of _____.
- mechanical stretching of crust
 - subaerial erosion
 - removal of deep lithospheric root
 - All of these
- 22) Small sedimentary basins formed and carried atop moving thrust sheets are called _____ basins.
- Peripheral foreland
 - Intracratonic
 - Intraarc
 - Piggyback
- 23) A map that emphasizes a particular set of data, for example, the average distribution of rainfall in an area, is called a _____ map.
- Thematic
 - Geomorphological
 - Drainage
 - Isopach
- 24) The benthic – Planktonic foraminiferal abundance ratio is commonly used to suggest _____
- Increase in salinity of the ocean
 - Increase in depth of the ocean
 - Decrease in depth of the ocean
 - None of the above

- 25) The construction of a spit or bar indicates a strong control of _____.
- Waves
 - Tidal currents
 - Longshore currents
 - Onshore winds
- 26) Which of the following models of landscape evolution explains long term evolution of slopes?
- Davison model
 - Penck's model
 - King's model
 - Hack's model
- 27) The broadest category in soil taxonomy is _____.
- Order
 - Family
 - Suborder
 - None
- 28) The lithostatic pressure at the base of a 35 km thick granitic crust with average density of 2.75 Mg/m³ would be _____.
- 9.6 kb
 - 8.5 kb
 - 5.5 kb
 - 9.2 kb
- 29) The soils characteristically showing calcic, gypsic, salic or natric horizons are known as _____.
- Aridisols
 - Alfisols
 - Mollisol
 - Laterite
- 30) Which of the following is true for stratigraphic diagrams?
- Stratigraphic sections are similar to correlation diagrams except that the horizontal distance correspond to uniform scale
 - stratigraphic diagrams may have non-uniform scale
 - Stratigraphic diagrams are three dimensional
 - Fence diagram is a type of stratigraphic diagram
- 31) Statement: Sequence stratigraphic concepts are not applicable to non-marine successions where there are no marine surfaces with which to correlate.
- Statement is true
 - Statement is false
 - Statement is partially true
 - Statement is partially false
- 32) The 'fungal spike' is related to the _____ boundary.
- Precambrian-Cambrian
 - Permian-Triassic
 - Cretaceous-Tertiary
 - Neogene-Quaternary
- 33) Which of the following is not true for the Global Magnetic Polarity timescale
- The mammoth reversed is a polarity event.
 - The timescale encompasses the entire geological time.
 - The time divisions are designated as epochs and events.
 - The timescale is based on polarity of at different times of earth's history.
- 34) Metamorphism of the overlying sedimentary rocks due to the seepage of magmatic gases through it is a process known as _____
- Skarn mineralization
 - Fenitization
 - Mylonitization
 - Hydration
- 35) Most of the landmass was clustered near the south pole at the start of the _____ era.
- Palaeozoic
 - Mesozoic
 - Cenozoic
 - Precambrian
- 36) _____ surface is an erosional surface formed by means of wave or tidal scouring during transgression in coastal to upper shoreface settings.
- Correlative unconformity
 - Transgressive ravinement
 - Transgressive
 - Maximum flooding

- 37) Of the following geological sections, the _____ sections are the most perfect cross sections.
- Panel diagram
 - structural
 - columnar section
 - vertical litholog
- 38) _____ is the extinct Paleozoic heterogeneous group of fishes with primitive jaws carrying teeth, not of normal fish type, but modified, tooth-like bony plates with slicing edges.
- Acanthodia
 - Placodermi
 - Agnatha
 - Chonrichthyes
- 39) A section of fine-grained rocks that accumulated slowly, thereby representing a considerable span of time by very small thickness and is correlated with transgressive phase is known as _____.
- type section
 - transgressive section
 - condensed section
 - minor section
- 40) Biostratigraphic units based on fossils that show evolutionary change are _____ in the stratigraphic record.
- repeated
 - overlapping
 - absent
 - not repeated
- 41) Listric fault is characterized by _____.
- strike slip movement
 - gentle fault plane
 - curved fault plane
 - oblique slip
- 42) Overtuned cross stratification seen in some sandstones indicates _____
- tectonic activity
 - dragging of an object on surface
 - sudden change in current
 - overtuned folding of the rocks
- 43) Which of the following is not true for Thermohaline circulation in oceans?
- It explains the movement of subsurface ocean waters.
 - The movement of water is from equator to poles.
 - Downwelling occurs at poles and upwelling occurs at equator.
 - The driving force is temperature and salinity of sea water.
- 44) Ramp anticline can occur in the areas where _____
- thrusting on relatively undeformed footwall takes place
 - normal fault movement on low angle fault plane takes place
 - mass wasting on high slopes takes place
 - movements on normal listric fault takes place
- 45) Complete the following sentence with options given below.
A beach composed of coarse to medium sand and gravel will grade into _____
- fine sand and muddy sand towards offshore.
 - gravel and further coarsening of sediments towards offshore.
 - net transport of sediments towards offshore.
 - no change in gross grain size of the sediments towards offshore.
- 46) Which of the following statements are true for the depth of carbonate compensation depth (CCD)?
- The depth of CCD varies in the oceans.
 - The depths of CCD is rarely more than 5 kilometers depth.
 - The depth of CCD is less at equator than at the poles.
 - Most part of the ocean floor is above the CCD.
- Only (a) is true
 - (a) and (c) are true
 - (a), (b) and (d) are true
 - All of the above.

47) A non-destructive technique for estimation of elemental chemical composition of minerals is _____.

- A) XRF
- B) XRD
- C) ICP-AES
- D) EPMA

48) _____ is defined as the fitness of a certain area of land for a specific use.

- A) Land capability
- B) Land suitability
- C) Land availability
- D) Land use

49) Most geomorphological maps prepared in different countries and regions cannot be compared and are unable to provide complete representation of landscape at different scales as they are based on the traditional _____ mapping system.

- A) grid
- B) altimetric
- C) symbol based
- D) theme based

50) The term _____ denotes an intertonguing stratigraphic body.

- A) lithostrome
- B) lithosome
- C) lithotope
- D) lithofacies

Rough Work: