

EARTH SCIENCES

Name & Signature of the Invigilator

PAPER-II OMR Answer Sheet No. :
DEC-19/20

Roll No. :

(in figures as in Hall Ticket)

Roll Number in words :

Time : 2 Hours]

No. of Printed Pages : 26

[Maximum Marks : 200

Instructions for the Candidates

1. Write your Roll Number in the space provided on the top of this page.
2. This paper consists of one hundred (100) multiple choice type of questions. All questions are compulsory.
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 :
 - (i) 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.
 - (ii) Tally the number of pages and number of questions in the booklet with the information printed on the cover page. Faulty 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.
 - (iii) 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 oval as indicated below on the correct response against each item.

Example : (A) (B) (C) (D) where (B) is the 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 oval 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 any electronic devices or log table etc., are prohibited.
12. There shall be no negative marking.
13. In case of any discrepancy in the English and Gujarati versions of questions, English version will be taken as final.

પરીક્ષાર્થીઓ માટે સૂચનાઓ :

1. આ પાનાની ટોચ પર દર્શાવેલી જગ્યામાં તમારો રોલ નંબર લખો.
2. આ પ્રશ્નપત્રમાં બહુવૈકલ્પિક ઉત્તરો ધરાવતા સો (૧૦૦) પ્રશ્નો આપેલા છે. બધા જ પ્રશ્નો ફરજિયાત છે.
3. પરીક્ષાની શરૂઆતમાં આપને પ્રશ્નપુસ્તિકા આપવામાં આવશે. પ્રથમ પાંચ (૫) મિનિટ દરમિયાન તમારે પ્રશ્નપુસ્તિકા ખોલી અને ફરજિયાતપણે નીચે મુજબ પરીક્ષા કરવું :
 - (i) પ્રશ્નપુસ્તિકાનો વપરાશ કરવા માટે આ કવર પૃષ્ઠની ઘાર પર આપેલ સીલ સ્ટીકર ફાડી નાખો. કોઈપણ સંજોગોમાં સીલ સ્ટીકર વગરની કે ખુલ્લી પ્રશ્નપુસ્તિકા સ્વીકારશો નહીં.
 - (ii) કવર પૃષ્ઠ પર છપાયેલ નિર્દેશાનુસાર પ્રશ્નપુસ્તિકાના પ્રશ્નો, પૃષ્ઠો અને સંખ્યાને બરાબર ચકાસી લો. ખામીયુક્ત પ્રશ્નપુસ્તિકા કે જેમાં પ્રશ્નો/પૃષ્ઠો ઓછાં હોય, બે વાર છપાયા હોય, અનુક્રમમાં અથવા અન્ય કોઈ ફરક હોય અર્થાત કોઈપણ સંજોગોમાં ખામીયુક્ત પ્રશ્નપુસ્તિકા સ્વીકારશો નહીં. અને જો ખામીયુક્ત પ્રશ્નપુસ્તિકા મળી હોય તો નિરીક્ષક પાસેથી તુરંત જ બીજી સારી પ્રશ્નપુસ્તિકા મેળવી લેવી. આ માટે ઉમેદવારને પાંચ (૫) મિનિટનો સમયગાળો આપવામાં આવશે. પછીથી, પ્રશ્નપુસ્તિકા બદલવામાં આવશે નહીં કે કોઈ વધારાનો સમયગાળો આપવામાં આવશે નહીં.
 - (iii) આ ચકાસણી સમાપ્ત થાય પછી, પ્રશ્નપુસ્તિકાનો નંબર OMR જવાબ પત્રક પર લખવો અને OMR જવાબ પત્રકનો નંબર પ્રશ્નપુસ્તિકા પર લખવો.
4. પ્રત્યેક પ્રશ્ન માટે ચાર જવાબ વિકલ્પ (A), (B), (C) અને (D) આપવામાં આવેલ છે. તમારે સાચા જવાબના ઓવલ (oval) ને નીચે આપેલ ઉદાહરણ મુજબ પેનથી ભરીને સંપૂર્ણ કરવાનું રહેશે.

ઉદાહરણ : (A) (B) (C) (D) કે જ્યાં (B) સાચો જવાબ છે.
5. આ પ્રશ્નપુસ્તિકાના પ્રશ્નો ના જવાબ અલગથી આપવામાં આવેલ OMR જવાબ પત્રકમાં પેપર-II લખેલ વિભાગમાં જ અંકિત કરવા. જો આપ OMR જવાબ પત્રકમાં આપેલ ઓવલ (oval) સિવાય અન્ય સ્થાને જવાબ અંકિત કરશો તો તે જવાબનું મૂલ્યાંકન કરવામાં આવશે નહીં.
6. અંદર આપેલ સૂચનાઓ ધ્યાનપૂર્વક વાંચો.
7. કાચું કામ (Rough Work) પ્રશ્નપુસ્તિકાના અંતિમ પૃષ્ઠ પર કરવું.
8. જો આપ OMR જવાબ પત્રક નિયત જગ્યા સિવાય અન્ય કોઈપણ સ્થાને, આપનું નામ, રોલ નંબર, ફોન નંબર અથવા એવું કોઈ ચિહ્ન કે જેનાથી તમારી ઓળખ થઈ શકે, અંકિત કરશો અથવા અલ્પદ ભાષાનો પ્રયોગ કરો, અથવા અન્ય કોઈ અનુચિત સાધનોનો ઉપયોગ કરો, જેમ કે અંકિત કરી દીધેલ જવાબ ભૂંસી નાખવો કે સફેદ શાહીનો ઉપયોગ કરી બદલશો તો આપને પરીક્ષા માટે અયોગ્ય જાહેર થઈ શકો છો.
9. પરીક્ષા સમય પૂરો થઈ ગયા બાદ ઓરીજનલ OMR જવાબ પત્રક જે તે નિરીક્ષકને ફરજિયાત સોંપી દેવું અને કોઈ પણ સંજોગોમાં તે પરીક્ષાખંડની બહાર લઈ જવું નહીં. પરીક્ષા પૂર્ણ થયા બાદ ઉમેદવાર ઓરીજનલ પ્રશ્નપુસ્તિકા અને OMR જવાબ પત્રકની ડુપ્લિકેટ કોપી પોતાની સાથે લઈ જઈ શકે છે.
10. માત્ર કાળી/ભૂરી બોલ પોઈન્ટ પેન વાપરવી.
11. કેલ્ક્યુલેટર, લોગ ટેબલ અને અન્ય ઈલેક્ટ્રોનિક યંત્રોનો ઉપયોગ કરવાની મનાઈ છે.
12. ખોટા જવાબ માટે નકારાત્મક ગુણકાંન પ્રથા નથી.
13. પ્રશ્નપુસ્તિકાના કોઈ પ્રશ્નમાં અનુવાદ અંગે કોઈ વિવાદ/મતભેદ જણાય તો અંગ્રેજી વર્ઝન યોગ્ય ગણાશે.

EARTH SCIENCES

PAPER-II

Note : This paper contains **One Hundred (100)** multiple-choice, matching questions, each question carrying **TWO (2)** marks. Attempt **All** the questions.

1. Original composition of the most of the molluscan shells is made up of :

(A) Calcite	(B) Dolomite
(C) Silica	(D) Aragonite

2. The hinge type in bivalves having short teeth, arranged in straight or chevron pattern, slightly inclined and ventrally convergent situated along the edge below umbo is known as :

(A) Schizodont type	(B) Taxodont type
(C) Isodont type	(D) Pachyodont type

3. In gravity prospecting the rock masses present or lacking between the elevations of the successive stations cause variation in gravity values, the effect of these rock masses has to be corrected by applying :

(A) Topographic correction	(B) Free air correction
(C) Terrain correction	(D) Bouger correction

4. Choose the correct match from Group-I (type of microfossil group) with Group-II (Composition). Select the correct option :

Group-I		Group-II	
(1) Radiolaria		(a) Calcareous	
(2) Foraminifera		(b) Phosphatic	
(3) Chonodonts		(c) Organic walled	
(4) Acritarchs		(d) Siliceous	

- (1) (2) (3) (4)
(A) (b) (a) (d) (c)
(B) (d) (a) (b) (c)
(C) (d) (c) (b) (a)
(D) (c) (a) (b) (d)

5. Indian Monsoon is affected by :

- (A) Labrador Current (B) El-Nino
(C) Benguela Currents (D) Ohio Currents

6. Which radio-isotope is used in cosmogenic dating method ?

- (A) U^{238} (B) ^{14}C
(C) Th^{232} (D) Be^{10}

7. Difference between extentional arc and compressional arc lithological setting is :
- (i) Basalt-dacite bimodal volcanics in extensional area.
(ii) Andesite-dacite-rhyolite volcanics and tonalite-granodiorite plutonic igneous rocks in compressional arcs :
- (A) (i) and (ii) are correct
(B) (i) is correct and (ii) is incorrect
(C) (i) and (ii) are incorrect
(D) (i) is incorrect and (ii) is correct
8. Which one of the following stresses can change shape of a body without altering the volume :
- (A) Compressional (B) Shear
(C) Tensile (D) Poisson's ratio
9. Choose the correct combination of items listed in Group-I (Geological time) with those of Group-II (Time duration). Select the correct answer :

Group-I

- (1) Phanerozoic
(2) Proterozoic
(3) Archaen
(4) Cenozoic

Group-II

- (a) 543 m. yrs ago - present
(b) 2.5 billion yrs - 543 m. yrs.
(c) 65 m. yrs - present
(d) 248 m. yrs - present
(e) 2.5 billion yrs - 4 billion years ago

- | | | | | |
|-----|-----|-----|-----|-----|
| | (1) | (2) | (3) | (4) |
| (A) | (a) | (b) | (e) | (c) |
| (B) | (c) | (a) | (b) | (d) |
| (C) | (a) | (e) | (b) | (c) |
| (D) | (b) | (a) | (e) | (c) |

10. GIS analysis use spatial and non-spatial data. Which one of the below given options is *not* an example of spatial data ?
- (A) Points showing location of discrete objects
 - (B) Lines showing the linear or route features
 - (C) Polygons representing the area occupied by a particular variable (eg. landuse, city etc)
 - (D) Times of particular events
11. Appropriate geophysical prospecting method for locating porphyry Cu-deposit can be :
- (A) Magnetic method
 - (B) Gravity method
 - (C) IP method
 - (D) Resistivity method
12. Well-sorted sandstone with about 3/4th Quartz percentage and rock fragments in excess of feldspar is classified as :
- (A) Greywacke
 - (B) Lithicwacke
 - (C) Lithic arenite
 - (D) Feldspathic arenite
13. In which of the following seismic prospecting methods a number of detectors are placed readily at distances of several kilometers from a shot point ?
- (A) Arc shooting
 - (B) Profile shooting
 - (C) Arc cum profile shooting
 - (D) Fan shooting

14. The Magnetic needle turning about a vertical axis points towards the magnetic north and makes a small angle with the geographic meridian. The angle is called :

(A) Inclination

(B) Declination

(C) Vertical component

(D) Horizontal component

15. In a P(y-axis) – T (x-axis) diagram of aluminosilicate polymorphs :

(i) dP/dT of kyanite-sillimanite transition is positive

(ii) dP/dT of andalusite-sillimanite transition is negative

(A) (i) and (ii) are correct

(B) (i) is correct and (ii) is incorrect

(C) (i) and (ii) are incorrect

(D) (i) is incorrect and (ii) is correct

16. Choose the *correct* option considering the following statements :

(i) Gibbs free energy is an intensive property

(ii) Chemical potential is an extensive property

(A) (i) is correct and (ii) is incorrect

(B) (i) is incorrect and (ii) is correct

(C) (i) and (ii) are correct

(D) (i) and (ii) are incorrect

17. The global sea level was much lower than present about 120 m during :
- (A) Last Interglacial (B) LGM
(C) LIA (D) MWP
18. Which one of the following according to Folk's scheme of classification of carbonate rocks, is not an allochem ?
- (A) Pellet (B) Oolite
(C) Micrite (D) Fossil (Bioclast)
19. Which one of the following biozone is extensively used in Quaternary biostratigraphy ?
- (A) Opper zone (B) Barren interzones
(C) Acme biozone (D) Assemblage biozone
20. Generally, in the direction of the transportation, the grain size of sediment
- (A) Decreases
(B) Increases
(C) Remains constant
(D) Depends upon the duration of transport
21. The unconformity between the Lower Aravalli Group and the Upper Aravalli Group is overlain by
- (A) Jhamarkotra Formation (B) Debari Formation
(C) Zawar Formation (D) Udaipur Formation

22. In the Indian shield, life appeared about 3800 Ma ago. This cyanobacterial life is represented by
- (A) Carbonate rocks of the Chitraduraga Group
(B) Sulphide ore deposits of the Chitradurga Group
(C) Kolar schist belt
(D) Ramagiri schist belt
23. The typical non-marine evaporite deposit is :
- (A) Halite (B) Gypsum
(C) Trona (D) Dolomite
24. Which one of the following is the correct option for representing inner planets of solar system ?
- (A) Mercury, Venus, Earth, Mars
(B) Uranus, Neptune, Venus, Earth
(C) Mercury, Mars, Earth, Saturn
(D) Neptune, Venus, Mars, Earth
25. In which of the following electrode arrangements the current electrodes are denoted by C_1 and C_2 and the potential electrodes by P_1 and P_2 ?
- (A) Wenner arrangement (B) Schlumberger arrangement
(C) Lee partitioning arrangement (D) Single probe arrangement
26. Which one of the following is a dry flow of clay-size material commonly moving at slow speed ?
- (A) Debris flow (B) Earth flow
(C) Lahars (D) Solifluction

27. Degree of freedom at eutectic point in a binary system is
- (A) 1 (B) 2
(C) 3 (D) 0
28. The steep-sided regular magmatic body with the shape of reverse tear is called :
- (A) Plutons (B) Porphyres
(C) Diapirs (D) Ring dikes
29. Which of the following is the oldest Archaean craton of the Indian shield ?
- (A) Bundelkhand Craton (B) Dharwar Craton
(C) Singhbhum Craton (D) Bastar Craton
30. ACF diagram representing transformations during metamorphism of basalts can be named as :
- (i) Pseudocomponent diagram
(ii) Phase diagram
(iii) Chemographic diagram
(iv) Compatibility diagram
- (A) (i) and (ii)
(B) (i), (ii) and (iii)
(C) (i), (ii), (iii) and (iv)
(D) (ii), (iii) and (iv)
31. The Banded Gneissic Complex (BGC) of the Bundelkhand craton in the Mewar block is also described as the
- (A) Aravalli Supergroup (B) Delhi Supergroup
(C) Bhilwara Supergroup (D) Bundelkhand Granites

32. Among the following options, which is typical of a 'Paludal Environment'?
- (A) Tidal flat (B) Lagoon
(C) Marshes (D) Swamp
33. Deep gorges, incised meanders and water gaps are diagnostic geomorphic features of :
- (A) Superimposed rivers (B) Beheaded rivers
(C) Anastomosing rivers (D) Antecedent rivers
34. Type of sediment bedding characterized by reversed foreset laminae is referred as :
- (A) Herring bone bedding (B) Flaser bedding
(C) Convolute bedding (D) Lenticular bedding
35. Match List-I with List-II and select the *correct* answer using the codes given below the list :

List-I

- (1) Matuyama
(2) Gilbert
(3) Gauss
(4) Bruhnes

List-II

- (a) 0 – 0.73 my
(b) 0.73 – 2.43 my
(c) 2.43 – 3.40 my
(d) 3.40 – 4.49 my

Codes :

- | | | | | |
|-----|-----|-----|-----|-----|
| | (1) | (2) | (3) | (4) |
| (A) | (a) | (b) | (d) | (c) |
| (B) | (d) | (c) | (a) | (b) |
| (C) | (b) | (d) | (a) | (c) |
| (D) | (b) | (d) | (c) | (a) |

36. This is used to determine the plate velocities in general, find out which is correct ?
- (i) Magnetic anomalies
 - (ii) Transform faults
 - (iii) Hot spots
- (A) (ii) and (iii)
(B) Only (iii)
(C) Only (i)
(D) (i) and (iii)
37. This rock can form by a magmatic as well as metamorphic process :
- (A) Blueschist (B) Granodiorite
(C) Charnockite (D) Gabbro
38. This generally indicates formation under magmatic conditions :
- (A) Oscillatory zoning (B) Curved inclusion trails
(C) Straight inclusion trails (D) Skeletal texture
39. The highest point on the vertical profile through a ripple is known as :
- (A) Toe point (B) Crest
(C) Trough point (D) Summit point
40. Fundamental unit of lithostratigraphic nomenclature is :
- (A) Period (B) Formation
(C) Member (D) Group

41. A glacier which reaches the base of the mountains and spreads across the lowlands is called :
- (A) Valley glacier (B) Cirque glacier
(C) Piedmont glacier (D) Temperate glacier
42. The large waves which create an oscillatory movement in the water column and caused by under sea disturbances are called :
- (A) Tropical storms (B) Cyclones
(C) Hurricanes (D) Tsunamis
43. For a cylindrical fold which one of the following is correct ?
- (A) Hinge line is straight
(B) Hinge line is curved
(C) Axial plane is vertical
(D) Limbs are inclined at the same angle
44. A mesoscopically penetrative parallel alignment of planar fabric elements in a rock is known as :
- (A) Cleavage (B) Lineation
(C) Foliation (D) Composition bending
45. Anthophyllite is a
- (A) Fe-Mg monoclinic amphibole
(B) Fe orthorhombic amphibole
(C) Mg orthorhombic amphibole
(D) Mg monoclinic amphibole

46. In single chain pyroxenes and pyroxenoids :
- (i) Periodicity of pyroxene chain is 5.2\AA
 - (ii) Periodicity of pyroxenoid chain is 7.3\AA
- (A) (i) is correct and (ii) is incorrect
 - (B) (i) and (ii) are both incorrect
 - (C) (ii) is correct and (i) is incorrect
 - (D) (i) and (ii) are both correct
47. minerals in the rocks are responsible to form slaty cleavage.
- (A) Ferruginous
 - (B) Micaceous
 - (C) Siliceous
 - (D) Carbonaceous
48. Southerly dipping Quartzite beds on an east-west aligned tunnel axis can generally cause
- (A) Overbreaking
 - (B) Water seepage
 - (C) Unstable tunnel walls
 - (D) Uneven tunnel floor
49. Which one of the following is a trellis type of drainage pattern :
- (A) When the parent and tributary streams flow parallel to each other
 - (B) If there is a right angle bend in both, tributary and parent streams
 - (C) When streams radiate in all directions from or towards a common centre
 - (D) If elongated tributaries following parallel or sub-parallel to mainstream and the principal tributaries join main stream at right angles

50. The most typical intertrappean macrofossil is :
- (A) Trigonia (B) Physa
(C) Murex (D) Cardita
51. Which mineral is not formed when quartz and muscovite react at high temperature ?
- (A) Oligoclase (B) K-Feldspar
(C) Sillimanite (D) Andalusite
52. On the geological map one finds the repetition of beds, one may conclude the presence of
- (A) Unconformity (B) Folding
(C) Non-conformity (D) Erosion
53. Which of the following statements is TRUE in case of the groundwater aquifers ?
- (A) Specific yield plus the specific retention is equal to the porosity
(B) Specific yield minus the specific retention is equal to the porosity
(C) Specific yield and specific retention, both are same
(D) Specific yield has no relation with specific retention
54. Mineral formula for bornite is
- (A) $\text{CuSO}_4 \cdot 3\text{Cu}(\text{OH})_2$ (B) $2\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$
(C) Cu_2S (D) Cu_5FeS_4

55. This ore of iron contains highest amount of Fe but is not a preferred ore for Fe-extraction in India.
- (A) Hematite (B) Magnetite
(C) Goethite (D) Pyrite
56. Graptolites are found abundantly in which of the following lithology ?
- (A) Cherty limestone (B) Black sandstone
(C) Black carbonaceous shales (D) Dark micritic limestones
57. The abrasive wearing of rocks by sediments moving close to the channel bed is called :
- (A) Corrosion (B) Corrasion
(C) Cavitation (D) Attrition
58. Darcy's law determines the flow of the water through porous media. However, it cannot be applied to those soils which are
- (A) Very fine grained (B) Gravelly in nature
(C) Sandy in nature (D) Moderately permeable
59. It is the type of fault that characterized by the blocks above the fault plane moves upward relative to the block below the fault plane :
- (A) Reverse (B) Normal
(C) Strike-slip (D) Listric normal fault
60. The conical shaped long, acute spire of gastropod form is referred as :
- (A) Globular (B) Turbinate
(C) Cerrated (D) Turreted

61. Match list-I with list-II and select the *correct* answer using the codes given below the list :

List-I

- (1) TTT
- (2) TTF
- (3) FFT
- (4) RRR

List-II

- (a) San Andreas fault and Mendoceno fracture zone
- (b) Central Japan
- (c) East Pacific Rise and Galapagos Rift-zone
- (d) Peru-Chile Trench and West Chile rise

Codes :

- | | | | |
|---------|-----|-----|-----|
| (1) | (2) | (3) | (4) |
| (A) (a) | (b) | (c) | (d) |
| (B) (b) | (d) | (a) | (c) |
| (C) (b) | (a) | (d) | (c) |
| (D) (d) | (a) | (c) | (b) |

62. Choose the *correct* option based on the following statements :

- (i) Pyrite and marcasite have similar compositions.
 - (ii) Pyrrhotite contains less Fe than pyrite.
- (A) (i) is correct and (ii) is incorrect
 - (B) (i) and (ii) are correct
 - (C) (i) is incorrect and (ii) is correct
 - (D) (i) and (ii) are incorrect

63. The largest dinosaur among the following to walk on land during Mesozoic Period is :
- (A) Brontosaurus (B) Tyrannosaurus
(C) Brachiosaurus (D) Ichtyosaurus
64. The hardness of the water is accounted to
- (A) dissolution of silica (B) dissolution of carbonates
(C) precipitation of carbonates (D) precipitation of chlorides
65. Large Igneous Province (LIP) magmatism is generally associated with :
- (i) Mantle plumes
(ii) Divergent plate boundaries
(iii) Convergent plate boundaries
- (A) Only (i) and (ii) are correct
(B) Only (i) and (iii) are correct
(C) Only (ii) and (iii) are correct
(D) Only (ii) is correct
66. Sandstone consisting of coarse, angular grains is termed as :
- (A) Arkosic arenite (B) Grit
(C) Greywacke (D) Gannister
67. A rock body that has high porosity but low permeability is called as
- (A) Aquifer (B) Aquitard
(C) Aquiclude (D) Aquifluge

68. Black body radiation curve based on Stephan-Boltzmann's law indicate that
- (A) At higher temperature greater contribution is from shorter wavelength
 (B) A higher contribution is from larger wavelength
 (C) Temperature doesn't have control over radiation
 (D) At higher temperature lesser contribution is from shorter wavelength
69. The term benioff-zone is used for which of the following plate boundary ?
- (A) Subduction zone (B) Obduction zone
 (C) Transcurrent zone (D) Collision zone
70. Which one of the following is the most common reservoir rock for petroleum ?
- (A) Shale (B) Granite (fractured)
 (C) Conglomerate (D) Limestone
71. Which of the following is *not* a mineral ?
- (A) Duomortierite (B) Hedenbergite
 (C) Pseudotachylite (D) Monazite
72. Match the following items from Group-I (Name of fossil) with those of Group-II (Fossil group), choose the *correct* option :

Group-I	Group-II
(1) Rhyconella	(a) Gastropod
(2) Gryphae	(b) Pelecypod
(3) Cerethium	(c) Brachiopod
(4) Nautilus	(d) Cephalopod

Codes :

- | | | | |
|---------|-----|-----|-----|
| (1) | (2) | (3) | (4) |
| (A) (c) | (b) | (a) | (d) |
| (B) (c) | (b) | (d) | (a) |
| (C) (b) | (d) | (a) | (c) |
| (D) (c) | (d) | (b) | (a) |

73. Which of the following is most reflective absorber of the solar radiation in the earth's atmosphere ?
- (A) Oxygen (B) Ozone
(C) Nitrogen (D) Sulphur
74. The feature consist of large grooves or furrows spanning several feet from crest to crest and several inches deep and parallel to the direction of displacement is known as
- (A) Drags (B) Mullion structures
(C) Isoclinal folds (D) Ptygmatic folding
75. Which one of the following landscape assemblages are generally observed in areas of crystalline rocks ?
- (A) Pediments, inselbergs, alluvial aprons
(B) Alluvial fan, bajada, bolson
(C) Canyons, playas, arches
(D) Custas, mesas, buttes
76. Following conditions will favour explosive volcanism :
- (A) High viscosity and low volatile content
(B) Low viscosity and high volatile content
(C) Low viscosity and low volatile content
(D) High viscosity and high volatile content

77. Trilobites are index fossils of :
- (A) Cambrian to Ordovician (B) Permian to Triassic
(C) Cambrian to Triassic (D) Triassic to Jurassic
78. Which one of the following is a cold desert ?
- (A) Patagonia (B) Thar
(C) Arabia (D) Atcama
79. load can be defined as that part of the total load of a stream whose immersed weight is carried by the fluid.
- (A) Suspended (B) Solid
(C) Solution (D) Bed
80. Maximum lateral extent in Cuddapah basin is displayed by :
- (A) Papaghani Group (B) Chitravati Group
(C) Kistna Group (D) Nallamalai Group
81. Which amongst the following is the most likely assemblage representing contact metamorphism ?
- (A) Cordierite + biotite + muscovite + quartz
(B) Cordierite + *k*-feldspar + sillimanite + quartz
(C) Cordierite + garnet + *k*-feldspar + sillimanite + quartz
(D) Staurolite + garnet + muscovite + biotite + quartz

82. The presence of aerosols in the atmosphere typically does type of scattering of EM waves.
- (A) Mie scattering (B) Rayleigh scattering
(C) Non-selective scattering (D) Back scattering
83. are isolated or comparatively isolated elevations rising 1000 m or more from the sea floor and with small summit area.
- (A) Guyots (B) Sea-mounts
(C) Calderas (D) Continental shelves
84. In a ' n ' component system, generally, number of phases participate in a univariant reaction and number of phases are required at invariant point.
- (A) $n + 2, n + 1$ (B) $n + 2, n + 2$
(C) $n + 1, n + 2$ (D) $n + 1, n + 1$
85. Which is true for El Niño-ENSO ?
- (i) Abnormally warm sea surface temperatures from the date line east to the south American coast.
- (ii) Changes in the distribution of tropical rainfall from the eastern Indian Ocean east to the tropical Atlantic.
- (iii) Changes in sea level pressure throughout the global tropics.
- (iv) Large scale atmospheric circulation changes in the tropics and portion of extratropics in both hemispheres.
- (A) Only (i) is true
(B) Only (ii) is true
(C) All are true
(D) Only (iv) is true

86. Which of the following is *not* a component of GIS ?
- (A) Computer system (B) Satellite data
(C) DM procedure (D) Power supply
87. A pinacoid is a crystal form consisting of :
- (A) 1-face (B) 2-faces
(C) 3-faces (D) 4-faces
88. A cone shaped depositional feature formed at the foot of a mountain front is called :
- (A) Alluvial plain (B) Delta
(C) Alluvial fan (D) Bajada
89. The oldest group of rocks in Gujarat are referred as :
- (A) Champaner (B) Rialo
(C) Sausar (D) Nallamalai
90. According to the temperature the correct sequence of atmospheric layering from the surface upward is :
- (A) Stratosphere, troposphere, thermosphere, mesosphere
(B) Troposphere, stratosphere, mesosphere, thermosphere
(C) Stratosphere, troposphere, mesosphere, thermosphere
(D) Thermosphere, troposphere, stratosphere, mesosphere

91. Choose from the following the correct stratigraphic succession (from oldest to youngest) of the mesozoic sequence of Kutch Basin.
- (A) Umia — Patcham — Chari — Bhuj — Katrol
 - (B) Patcham — Chari — Katrol — Umia — Bhuj
 - (C) Patcham — Chari — Bhuj — Umia — Katrol
 - (D) Chari — Patcham — Umia — Katrol — Bhuj
92. This metamorphic facies represents transition between diagenesis and metamorphism :
- (A) Sanidinite facies
 - (B) Greenschist facies
 - (C) Amphibolite facies
 - (D) Zeolite facies
93. For the aggregates to be used in road construction, which of the following statements is *not* true ?
- (A) Crushing strength is more important than tensile strength
 - (B) Toughness is more important than abrasion strength
 - (C) Reactivity with tar is more important than that with the water
 - (D) Size is more important than its shape
94. Which mineral is absent in low P series of metamorphism ?
- (A) Sanidine
 - (B) Cordierite
 - (C) Muscovite
 - (D) Kyanite
95. Branch of earth science that deals with the study of conditions of burial of fossils is known as :
- (A) Taxonomy
 - (B) Taphonomy
 - (C) Ichnology
 - (D) Tophonomy

96. A cumulus cloud is characterized by :
- (A) Precipitation
 - (B) Heavy rain
 - (C) Obvious vertical dimension
 - (D) Dark colour of the cloud
97. A core drilled for 25 m depth has recovered various lengths of core pieces. The total length of the core pieces larger than 10 cm is measured to be 18 m. What will be the RQD class for this core recovery ?
- (A) Excellent
 - (B) Good
 - (C) Fair
 - (D) Poor
98. Which of the following statements is correct ?
- (A) Olivine is tectosilicate
 - (B) Every polymorphic transformation represents a discontinuous reaction
 - (C) Hydration of basalt is endothermic
 - (D) Muscovite is a dioctahedral mica
99. The oldest forms of gastropods are recorded from which one of the following geological periods ?
- (A) Early Cambrian
 - (B) Early Proterozoic
 - (C) Triassic
 - (D) Permian
100. Curved tree trunks on a hill slope having its convexity downsloping suggest
- (A) Soil slide area
 - (B) Rock fall area
 - (C) Rock slide area
 - (D) Rock creep area

ROUGH WORK

SEAL