Test Booklet Code & Serial No.
प्रश्नपत्रिका कोड व क्रमांक

B

Paper-II

EARTH, ATMOSPHERIC, OCEAN AND PLANETARY SCIENCE

Signature and Name of Invigilator

1. (Signature) .....

(Name) .....

2. (Signature) .....

(Name) .....

Seat No. | | | | | | |

(In figures as in Admit Card)

Seat No. .....

(In words)

OMR Sheet No. | | | | | | |

(To be filled by the Candidate)

JUN - 35220

Time Allowed : 2 Hours] **[Maximum Marks : 200**

Number of Pages in this Booklet : **20** Number of Questions in this Booklet : **100**

Instructions for the Candidates

1. Write your Seat No. and OMR Sheet No. in the space provided on the top of this page.
2. This paper consists of **100** objective type questions. Each question will carry *two* marks. *All* questions of Paper II will be compulsory.
3. At the commencement of examination, the question booklet will be given to the student. In the first 5 minutes, you are requested to open the booklet and compulsorily examine it as follows :
   (*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 or 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 missing pages/questions or questions repeated or not in serial order or any other discrepancy should not be accepted and correct booklet should be obtained from the invigilator within the period of 5 minutes. Afterwards, neither the Question Booklet will be replaced nor any extra time will be given. The same may please be noted.
   (*iii*) After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
4. Each question 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 : where (C) is the correct response.
   (A) (B) ● (D)
5. Your responses to the items are to be indicated in the **OMR Sheet given inside the Booklet only.** If you mark at any place other than in the circle in the OMR Sheet, it will not be evaluated.
6. Read instructions given inside carefully.
7. Rough Work is to be done at the end of this booklet.
8. If you write your Name, Seat Number, Phone Number or put any mark on any part of the OMR 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, you will render yourself liable to disqualification.
9. You have to return original OMR 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 the Test Booklet and duplicate copy of OMR 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 is no negative marking for incorrect answers.

विद्यार्थ्यांसाठी महत्त्वाच्या सूचना

1. परिक्षार्थींनी आपला आसन क्रमांक या पृष्ठावरील वरच्या कोपऱ्यात लिहावा. तसेच आपणांस दिलेल्या उत्तरपत्रिकेचा क्रमांक त्याखाली लिहावा.
2. सदर प्रश्नपत्रिकेत 100 बहुपर्यायी प्रश्न आहेत. प्रत्येक प्रश्नास **दोन** गुण आहेत. या प्रश्नपत्रिकेतील **सर्व** प्रश्न सोडविणे अनिवार्य आहे.
3. परीक्षा सुरू झाल्यावर विद्यार्थ्याला प्रश्नपत्रिका दिली जाईल. सुरुवातीच्या 5 मिनीटांमध्ये आपण सदर प्रश्नपत्रिका उघडून खालील बाबी अवश्य तपासून पहाव्यात.
   (*i*) प्रश्नपत्रिका उघडण्यासाठी प्रश्नपत्रिकेवर लावलेले सील उघडावे. सील नसलेली किंवा सील उघडलेली प्रश्नपत्रिका स्विकारू नये.
   (*ii*) पहिल्या पृष्ठावर नमूद केल्याप्रमाणे प्रश्नपत्रिकेची एकूण पृष्ठे तसेच प्रश्नपत्रिकेतील एकूण प्रश्नांची संख्या पडताळून पहावी. पृष्ठे कमी असलेली/कमी प्रश्न असलेली/प्रश्नांचा चुकीचा क्रम असलेली किंवा इतर त्रुटी असलेली सदोष प्रश्नपत्रिका सुरुवातीच्या 5 मिनिटातच पर्यवेक्षकाला परत देऊन दुसरी प्रश्नपत्रिका मागवून घ्यावी. त्यानंतर प्रश्नपत्रिका बदलून मिळणार नाही तसेच वेळही वाढवून मिळणार नाही याची कृपया विद्यार्थ्यांनी नोंद घ्यावी.
   (*iii*) वरीलप्रमाणे सर्व पडताळून पाहिल्यानंतरच प्रश्नपत्रिकेवर ओ.एम.आर. उत्तरपत्रिकेचा नंबर लिहावा.
4. प्रत्येक प्रश्नासाठी (A), (B), (C) आणि (D) अशी चार विकल्प उत्तरे दिली आहेत. त्यातील योग्य उत्तराचा रकाना खाली दर्शविल्याप्रमाणे ठळकपणे काळा/निळा करावा.
   उदा. : जर (C) हे योग्य उत्तर असेल तर.
   (A) (B) ● (D)
5. या प्रश्नपत्रिकेतील प्रश्नांची उत्तरे **ओ.एम.आर. उत्तरपत्रिकेतच दर्शवावीत.** इतर ठिकाणी लिहिलेली उत्तरे तपासली जाणार नाहीत.
6. आत दिलेल्या सूचना काळजीपूर्वक वाचाव्यात.
7. प्रश्नपत्रिकेच्या शेवटी जोडलेल्या कोऱ्या पानावरच कच्चे काम करावे.
8. जर आपण ओ.एम.आर. वर नमूद केलेल्या ठिकाणा व्यतिरीक्त इतर कोठेही नाव, आसन क्रमांक, फोन नंबर किंवा ओळख पटेल अशी कोणतीही खूण केलेली आढळून आल्यास अथवा असभ्य भाषेचा वापर किंवा इतर गैरमार्गांचा अवलंब केल्यास विद्यार्थ्याला परीक्षेस अपात्र ठरविण्यात येईल.
9. परीक्षा संपल्यानंतर विद्यार्थ्याने मूळ ओ.एम.आर. उत्तरपत्रिका पर्यवेक्षकांकडे परत करणे आवश्यक आहे. तथापि, प्रश्नपत्रिका व ओ.एम.आर. उत्तरपत्रिकेची द्वितीय प्रत आपल्याबरोबर नेण्यास विद्यार्थ्यांना परवानगी आहे.
10. फक्त निळ्या किंवा काळ्या बॉल पेनचाच वापर करावा.
11. कॅलक्युलेटर किंवा लॉग टेबल वापरण्यास परवानगी नाही.
12. चुकीच्या उत्तरासाठी गुण कपात केली जाणार नाही.

Earth, Atmospheric, Ocean and Planetary Science
Paper II

Time Allowed : 120 Minutes] **[Maximum Marks : 200**

Note : This Paper contains **Hundred (100)** multiple choice questions. Each question carrying **Two (2)** marks. Attempt *All* questions.

1. The major lithotectonic units in the Himalaya are bounded by thrust. Arrange correctly the thrust/fault system from north to south in this context.

   (*a*) MCT

   (*b*) Tethian Fault

   (*c*) MBT

   (*d*) HFT

   (A) (*b*) (*a*) (*c*) (*d*)

   (B) (*a*) (*b*) (*c*) (*d*)

   (C) (*d*) (*a*) (*b*) (*c*)

   (D) (*c*) (*a*) (*b*) (*d*)

2. Lithophile elements show affinity for :

   (A) Sulphide phase

   (B) Atmosphere

   (C) Carbonate phase

   (D) Silicate phase

3. At an archaeological site, human remain were found and assigned an age of 2000 years. One wants to confirm this with ^{14}C dating whose half-life is 5730 years. If the proportion of $^{14}C/^{12}C$ in the remains is 6×10^{-13}, calculate their age (assume that the initial time the $^{14}C/^{12}C$ ratio was 1.2×10^{-12}).

   (A) 2379 years

   (B) 3379 years

   (C) 4779 years

   (D) 1379 years

4. Widmanstatten structure is associated with :

   (A) Tektites

   (B) Aerolites

   (C) Siderolites

   (D) Siderites

5. A chondrite normalised REE pattern of quartzo-feldspathic gneiss shows a sharp positive anomaly of Eu, which indicate presence of :

(A) Plagioclase in the sample

(B) Quartz in the sample

(C) Clinopyroxene in the sample

(D) Sillimanite in the sample

6. Global scale event at ~ 1.8 Ga and 0.9 Ga refer to :

(A) Amalgamation of super-continent Columbia and Rodinia

(B) Amalgamation of supercotinent Columbia and fragmentation of Rodinia

(C) Fragmentation of Super-continent Columbia and Rodinia

(D) Fragmentation of super-continent Columbia and amalgamation of Rodinia

7. Deep focus (~ 700 km) earthquakes are common in :

(A) Mid-oceanic ridge

(B) Island arc

(C) Himalayan mountain belt

(D) Continental rift

8. A P-ray reflects from an interface as both P- and S-rays. Compared to the angle of reflection of the P-wave, that of the S-wave is :

(A) The same

(B) Always bigger

(C) Always smaller

(D) Sometimes bigger, sometimes smaller

9. Of the following electrical methods which methods make use of the electric fields naturally present in the earth ?

(*i*) SP method

(*ii*) Resistivity methods

(*iii*) Equipotential line method

(*iv*) Induced polarisation method

(*v*) Telluric current method

(*vi*) Electromagnetic methods

(A) (*i*), (*ii*), (*iii*)

(B) (*i*) and (*v*)

(C) (*iii*) and (*iv*)

(D) (*iv*) and (*vi*)

10. Calculate the free-air anomaly observed on a mountain of height 2000 m which is fully compensated by a root of depth t = 10 km. The compensation is by a cylinder of radius 20 km, the density of the crust is 2.67 g/cm^3, and that of the mantle is 3.27 g/cm^3.

(A) 1932 gu

(B) 2743 gu

(C) 3854 gu

(D) 4965 gu

11. For a series of point in a line and at zero height which are affected by gravitational attraction exerted by a buried sphere of density contrast 1.5 gm/cm^3, the anomaly versus horizontal distance curve has a maximum of 4.526 MGal and a point of inflexion at 250 m from the maximum. Calculate the anomalous mass.

(A) 25.26 gu

(B) 45.26 gu

(C) 52.43 gu

(D) 60.10 gu

12. Which of the following relations between blocking temperature, Tb and Curie temperature Tc is correct ?

(A) Tb is always greater than Tc

(B) Tb is always less than Tc

(C) Tb is equal to or less than Tc

(D) Tb is equal to or greater than Tc

13. ..... is one of the allochemical constituent of carbonate rocks that is formed within the depositional basin by fragmentation of penecon-temporaneous, weakly cemented carbonate sediment.

(A) Extraclast

(B) Peloid

(C) Bioclast

(D) Intraclast

14. The mean atmospheric pressure at sea level is given equivalently as :

(A) 1013 mb (hpa)

(B) 984 mb (hpa)

(C) 1000 mb (hpa)

(D) 950 mb (hpa)

15. Which of the following Eon characterizes the more tonalitic batholiths, more biomodal volcanic suites and the komatites ?

(A) Phanerozoic

(B) Proterozoic

(C) Archean

(D) Mesozoic

16. The strain velocity becomes zero in ..... and is constant under ..... .

(A) Elastic flow, Plastic flow

(B) Plastic flow, Elastic flow

(C) Elastic flow, Rheology

(D) Plastic flow, Creep

17. In diagenesis when transformation of mineral typically involve changes in crystal chemistry is termed as ..... .
    (A) Neoformation
    (B) Neomorphism
    (C) Authigenesis
    (D) Paragenetic sequence
18. In the Big Bang model of formation and evolution of universe, the temperatures of Universe evolved from :
    (A) 10^{83} to 10^{5} K
    (B) –100 K to 10^{13} K
    (C) 10^{15} to 10^{3} K
    (D) 10^{13} K to 3 K
19. The most important evidence that the universe is expanding is produced by :
    (A) Supernova Explosion
    (B) Black holes
    (C) Galactic collapse
    (D) Doppler effect
20. Example of primitive material that survived for the age of the solar system is :
    (A) Carbonaceous chondrites
    (B) Iron chondrites
    (C) Magnesian Achondrites
    (D) Olivine peridotite
21. The meteorites of igneous origin that are thought to have been dislodged by impact from small bodies in the solar system are known as :
    (A) Enstatite
    (B) Carbonaceous chondrites
    (C) Achondrites
    (D) Ignimbrites
22. The cause of equatorial bulge of the Earth is :
    (A) Lunar gravitational attraction
    (B) Plate tectonics
    (C) Earth's anticlockwise rotation
    (D) Centrifugal effect of the Earth's rotation
23. The secondmost abundant element in the bulk earth is :
    (A) Oxygen
    (B) Iron
    (C) Magnesium
    (D) Silicon

24. In Köppen climate system "BW" climate is called :

(A) Monsoon

(B) Wet-and-dry

(C) Steppe

(D) Desert

25. The most appropriate term for ecological succession beginning on a previously vegetated area that has been recently disturbed because of human activities is :

(A) Primary Succession

(B) Secondary Succession

(C) Tertiary Succession

(D) Bog Succession

26. Match the following :

List I

(*a*) Atoll formation

(*b*) Gradualism

(*c*) Glacial theory

(*d*) Base level

List II

(*i*) W.M. Davis

(*ii*) Charles Darwin

(*iii*) James Hutton

(*iv*) J.L.R. Agassiz

Codes :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(*i*)	(*iii*)	(*iv*)	(*ii*)
(B)	(*ii*)	(*iii*)	(*iv*)	(*i*)
(C)	(*i*)	(*ii*)	(*iii*)	(*iv*)
(D)	(*ii*)	(*iv*)	(*iii*)	(*i*)

27. One of the following parameters is *not* included in the calculation of Froude Number :

(A) Flow depth

(B) Average velocity of flow

(C) Channel cross-sectional area

(D) Acceleration due to gravity

28. The movement of soluble and fine-grained material downward with descending water into sites of the soil B horizon.

(A) Illuviation

(B) Eluviation

(C) Induration

(D) Imbrication

29. The ground water system in which an aquifer is overlain and underlain by an aquifer represents which type of the following aquifer system ?

(A) Phreatic aquifer

(B) Perched aquifer

(C) Confined aquifer

(D) Semiconfined aquifer

30. Which one of the following is *not* a method of desalination ?

(A) Distillation

(B) Reverse Osmosis

(C) Electrodialysis

(D) Electrochlorosis

31. The belt overlying the water table in which water is drawn up from the zone of saturation and held against the force of gravity in all or some of the rock interstices is called ..... .
    (A) Specific retention
    (B) Static water level
    (C) Capillary fringe
    (D) Potentiometric surface
32. Coral bleaching is caused by :
    (A) Excessive pollutains in sea water
    (B) Excessive suspended sediments in sea water
    (C) Excessively cool sea water temperature
    (D) Excessively warm sea water temperature
33. Choose the *correct* answer regarding groin :
    (A) It is beach ridge built naturally
    (B) It is a wall built out into the sea at right angle to the shoreline
    (C) It is a wall built in the sea parallel to the shoreline
    (D) Sand accumulates on downdrift side of the groin
34. Choose the *correct* set of beaches on the west coast of India :
    (A) Mandvi—Colva—Marina
    (B) Varkala—Kovalam—Rishi-knoda
    (C) Digha—Colva—Ganpatipule
    (D) Shrivardhan—Calangute—Gokarna
35. One of the following deltas is classified as a river-dominated delta :
    (A) Mississippi
    (B) Nile
    (C) Mekong
    (D) Ganga-Brahmaputra
36. Read the following statements and choose the *correct* answer :
    (I) Maximum ocean salinity values occur in the subtropics and minimum values near the equator and the polar regions.
    (II) The maximum salinity levels in the subtropics are produced by a strong excess of precipitation over evaporation.
    (A) Both (I) and (II) are correct
    (B) (I) is correct but (II) is incorrect
    (C) (I) is incorrect but (II) is correct
    (D) Both (I) and (II) are incorrect
37. Read the following statements and identify the *correct* answer :
    (I) The frequency plot of Earth's topography and bathymetry reveals that the distribution is bimodal.
    (II) The cumulative curve of altitude and depth distribution is known as hypsographic curve.
    (A) Both (I) and (II) are incorrect
    (B) Both (I) and (II) are correct
    (C) (I) is correct but (II) is incorrect
    (D) (I) is incorrect but (II) is correct

38. Abrasion :

(A) It is a type of erosion by water, wind and glaciers

(B) It is absent in deserts where wind is the dominant agent of erosion

(C) It is absent in glaciated regions

(D) It is absent along the rocky coasts because of sea water salinity

39. The ratio of the combined stream lengths of a drainage basin to the basin area is defined as :

(A) Drainage density

(B) Stream frequency

(C) Bifurcation ratio

(D) Ruggedness number

40. True *or* False :

(I) Capillary forces are inversely proportional to the diameter of the conduits or pores transmitting the water.

(II) Capillary fringe is thicker in sandy soils or regolith than in clay grade soils.

(A) (I) is true, (II) is false

(B) (I) is false, (II) is true

(C) Both (I) and (II) are true

(D) Both (I) and (II) are false

41. Find the odd one :

(A) Scree

(B) Talus

(C) Colluvium

(D) Till

42. ..... are found in continental collision, at the base of crustal cross-section, continental-scale thrust fault that expose deep crust and as xenoliths sampled from the lower crust by alkali-basalts.

(A) Albite-epidote hornfels

(B) Greenschist

(C) Granet granulite

(D) Eclogite

43. Metaperidotite composed of olivine and pyroxene wholly or partially converted to ..... at subduction zones with interaction with sea water.

(A) Rodingite

(B) Sericite

(C) Serpentine

(D) Kaolinite

44. The characteristic assemblage of granulite facies is :

(A) Omphacite-Garnet-Lawsonite

(B) Hornblende-Plagioclase-garnet

(C) Scapolite-plagioclase-quartz

(D) Orthopyroxene-plagioclase-garnet

45. The ..... and ..... were times of major reef building.

(A) Silurian, Devonian

(B) Cambrian, Ordovician

(C) Ordovician, Silurian

(D) Mississipian, Pennsylvanian

46. ..... zone is a body of strata in which the maximum abundance of a particular species is found, though not its total range.

(A) Range zone

(B) Acme zone

(C) Assemblage zone

(D) Concurrent zone

47. Match the following stratigraphic units listed in Group I with the precambrian basins in Group II :

Group I

(*a*) Badami Group

(*b*) Kheinjua Fm

(*c*) Sullavai Group

(*d*) Papaghani Group

Group II

(P) Vindhyan

(Q) Chhattisgarh

(R) Kaladgi

(S) Cuddapah

(T) Pranahita Godavari

Codes :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(R)	(P)	(T)	(S)
(B)	(P)	(T)	(S)	(R)
(C)	(R)	(Q)	(T)	(S)
(D)	(P)	(Q)	(R)	(T)

48. Diagram where the horizontal and vertical axes represent the normal (σ_n) and shear (σ_s) stresses that act on planes through a point are known as :

(A) Fry diagram

(B) ϕ-diagram

(C) Mohr diagram

(D) Kinematic flow diagram

49. Which one of the following minerals melts incongruently ?

(A) Forsterite

(B) Pyrite

(C) Anorthite

(D) Quartz

50. Akermanite is an example of :

(A) Cyclosilicate

(B) Tectosilicate

(C) Sorosilicate

(D) Nesosilicate

51. Glaucophane is a :

(A) Calcic amphibole

(B) White mica

(C) Magnesium amphibole

(D) Alkali amphibole

52. Which one of the following does *not* control the interference colour of a mineral section observed under petrological microscope ?

(A) Orientation of section with respect to the crystallographic axis

(B) Thickness of the thin section

(C) Orientation of the vibration directions of e-rays and o-rays with respect to that of polariser and analyser

(D) Intensity of light

53. The d-spacing of a plane (110) of a cubic crystal with lattice parameter a = 5 Å is :

(A) 0.28 Å

(B) 2.5 Å

(C) 3.54 Å

(D) 7.07 Å

54. The variety of picrific basalt having abundant olivine (20-50 volume %) and less frequent augite phenocrysts with the groundmass of augite, olivine and plagioclase is called :

(A) Oceanite

(B) Diabase

(C) Kimberlite

(D) Ankaramite

55. The mafic rocks high in both magnesium and silica concentration and are thought to be usually formed in fore-arc environments, typically during the early stages of subduction are called :

(A) Komatiites

(B) Kimberlites

(C) Boninites

(D) Lamproites

56. Intrusive igneous rock that is composed essentially of nepheline and an alkali pyroxene, usually aegirine-augite is called :

(A) Wehrlite

(B) Harzburgite

(C) Limburgite

(D) Ijolite

57. ..... is a microstructure of glassy basaltic rocks characterised by radiating aggregates of fibrous crystal.

(A) Vugh

(B) Vesicle

(C) Variolitic

(D) Tiktites

58. A texture consisting of large crystal of quartz with mosaic substructure surrounded by a fine-grained aggregate of quartz, are termed as ..... texture.

(A) Mortar

(B) Diaphoresis

(C) Phyllonite

(D) Reaction rims

59. The Dharwar craton have experienced a regional metamorphism from north towards south grading into :

(A) Green Schist - Blue Schist - Barovian

(B) Green Schist - Amphibolite - Granulite

(C) Amphibolite - granulite - Eclogite

(D) Barovian - Amphibolite - Granulite

60. Common pathfinder elements in Geochemical exploration of copper-zinc-lead-silver and complex sulfide deposits are ..... .

(A) Rn, Bi, As

(B) Hg, Zn

(C) Mn, Mo

(D) As, Te, Au

61. Measurement of ..... and ..... of the rocks is essential to calculate the heat flux.

(A) temperature, gradient

(B) heat transfer and gradient

(C) rheology and thermal conductivity

(D) temperature gradient and thermal conductivity

62. In our solar system, the region near Neptune and beyond is known as :

(A) Kuiper belt

(B) Kepler's belt

(C) Planetary ocean

(D) Oort nebula

63. The moment of inertia of the Earth is derived from :

(A) Density variation

(B) Precession of the equinoxes

(C) Observations from moon

(D) Seismic wave propagation

64. The fastest and slowest stretching directions are fixed at ..... to the shear plane for progressive simple shear.

(A) 45°

(B) 0°

(C) 90°

(D) 0 to 30°

65. Material that flows as perfectly viscous, but only above a certain yield stress is called :

(A) Newtonian material

(B) Kelvinian material

(C) Bingham material

(D) Prahl material

66. A pervasive parallel foliation of fine-grained, platy minerals in a direction perpendicular to the direction of maximum finite shortening by deformation and low grade metamorphism is called :

(A) Foliation

(B) Slaty cleavage

(C) Schistocity

(D) S-Tectonite

67. Tsunami is a shallow water gravity wave. A Tsunami has occurred over the ocean at a distance of about 1100 km from the coast. After how much time will it reach the coast ?

(A) 1 hour

(B) 1 hour 30 minutes

(C) 2 hours

(D) 2 hours 30 minutes

68. Conditions favorable for the formation of fog are :

(A) RH 80%, cloudy sky, light wind, atmosphere unstable

(B) RH 80%, cloudy sky, wind calm, atmosphere unstable

(C) RH 80%, clear sky, light wind, atmsophere unstable

(D) RH 80%, clear sky, light wind, atmosphere stable

69. ..... maintains the ionospheric potential (Vi) of approximately ~ + 300 kV with respect to the Earth surface.

(A) Monsoonal rainfall activity

(B) Cyclonic and anti-cyclonic activity

(C) Thunderstorm and lightning activity

(D) Earthquake and Tsunami

70. The ratio of backscattering to the extinction coefficient for Rayleigh molecule is a constant of :

(A) 1.5

(B) < 1

(C) > 2

(D) Zero

71. Near the equator, the North-east trade winds converge with the South-east trade winds along a boundary called the :

(A) Subtropical convergence zone

(B) Intertropical convergence zone

(C) Polar convergence zone

(D) Extratropical convergence zone

72. The global mean pressure at the surface of the Earth is :

(A) 984 mb

(B) 1013 mb

(C) 950 mb

(D) 1000 mb

73. In the polar regions the net radiation throughout the year remains :

(A) Positive

(B) Negative

(C) Zero

(D) Constant

74. In the tropics the net radiation throughout the year is :

(A) Positive

(B) Negative

(C) Zero

(D) Constant

75. Which sub-division of Maharashtra receives the highest amount of rainfall during the South-west Monsoon Season ?

(A) Vidarbha

(B) Madhya Maharashtra

(C) Konkan

(D) Marathwada

76. The Dry Adiabatic Lapse Rate is :

(A) 6.5° K/km

(B) 5.8° K/km

(C) 9.8° K/km

(D) 1.6° K/km

77. Easterly Jet stream over the Indian Peninsular Region is observed during the :

(A) Winter season

(B) Pre-Monsoon season

(C) South-west Monsoon season

(D) Post-Monsoon season

78. The solar constant is 1367 Watt/m^2 but the average amount of energy incident on level surface outside the atmosphere is only :

(A) $1/8^{th}$ of it

(B) $1/4^{th}$ of it

(C) 1/2 of it

(D) $1/6^{th}$ of it

79. North-east Monsoon gives rainfall over :

(A) North-east India

(B) Tamil Nadu

(C) Maharashtra

(D) Jammu and Kashmir

80. In a Barotrophic atmosphere :

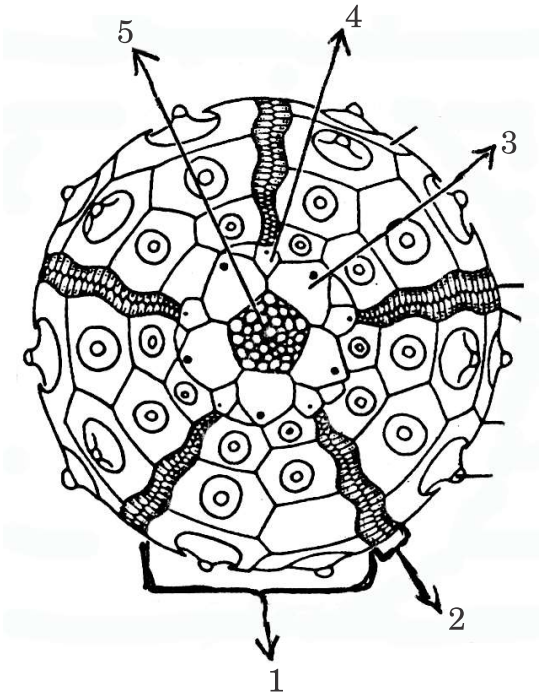
(A) Geostrophic wind speed increases with height

(B) Geostrophic wind speed decreases with height

(C) Geostrophic wind does not change with height

(D) Pressure is a function of temperature only

81. Consider the diagram of adapical surface of cedaroid morphology. Choose the *correct* set of 5 morphological terms.



(A) 1-ambularum, 2-interamulacrum, 3-ocular plate, 4-genital plate, 5-aboral pole

(B) 1-ambulacrum, 2-interambulacrum, 3-genital plate, 4-ocular plate, 5-aboral pole

(C) 1-interambulacrum, 2-ambulacrum, 3-genital plate, 4-ocular plate, 5-aboral pole

(D) 1-interambulacrum, 2-ambulacrum, 3-aboral pole, 4-ocular plate, 5-genital plate

82. The first group of jawed fish to radiate extensively were the :

(A) Ostracoderms

(B) Placoderms

(C) Cephalaspidomorphs

(D) Anaspids

83. The bottomhole temperature of a hydrocarbon gas reservoir is 140°F. What will be the amount of water expansion, per unit volume, that will occur when the pressure is decreased from 4000 psi to 3270 psi. (Given, estimated compressibility of water at 4000 psi is 2.8×10^{-6} psi^{-1}).

(A) 4.02

(B) 3.02

(C) 2.02

(D) 1.02

84. A well drilled for petroleum exploration recorded 80°C temperature at the depth of 3.2 km. Its formation temperature at a depth of 1800 meters will be ..... .

(A) 85.9°C

(B) 55.9°C

(C) 65.9°C

(D) 75.9°C

85. The organic matter constituents are listed below :

(*a*) Protein (up to 50% or more)

(*b*) Lipids (5 to 25%)

(*c*) Carbohydrates (not more than 40%)

(*d*) Lignins (25%)

Which of the above are true for organic matter of marine origin from Petroleum source rock context ?

(A) (*a*), (*b*), (*c*)

(B) (*a*), (*c*), (*d*)

(C) (*c*), (*a*), (*d*)

(D) (*d*), (*b*), (*a*)

86. ..... deposits are formed from cloud of ash that move out horizontally from a vent at hurricane velocities following a volcanic explosion.

(A) Air-fall

(B) Solfataras

(C) Blister

(D) Surge

87. Animals from ..... environment display little evolutionary change.

(A) coral reef

(B) deep-sea

(C) rock inter-tidal

(D) lagoonal

88. Important environmental factor that affects the type of organism in estuary is :

(A) type of sediment

(B) salinity

(C) sunlight

(D) temperature

89. Match the following site investigation in-situ test on the soil according to their characteristic parameter :

Test

(*a*) Standard Penetration Test

(*b*) Probing Penetration Test

(*c*) Cone Penetration Test

(*d*) Field Vane Test

Characteristic Parameters

(*i*) Measures the soils reaction to the continuous hydraulic insertion of a cone into the ground

(*ii*) It is dynamic penetration test carried out inside borehole on granular soil

(*iii*) To determine the undrained shear strength of soft cohesive soils

(*iv*) It estimate soils penetration resistance according to depth.

Codes :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(*ii*)	(*i*)	(*iv*)	(*iii*)
(B)	(*iii*)	(*iv*)	(*ii*)	(*i*)
(C)	(*ii*)	(*iv*)	(*i*)	(*iii*)
(D)	(*iv*)	(*ii*)	(*i*)	(*iii*)

90. One of the following is the greatest reservoir of carbon :

(A) Soil

(B) Terrestrial biomass

(C) Atmosphere

(D) Deep ocean

91. A natural levee is :

(A) formed by fluvial erosion

(B) built during periods of overbank flooding

(C) present only in the mountainous terrain

(D) absent along meandering rivers

92. Accelerated soil erosion is *not* associated with :

(A) Expansion of rills

(B) Expansion of gullies

(C) Increased sediment load in streams

(D) Increase in the thickness of soil profile

93. One of the following rivers has *not* developed a megafan :

(A) Kosi

(B) Gandak

(C) Chambal

(D) Son

94. In the Thar desert of India one of the following is the most common and widespread sand dune type :

(A) Barchan

(B) Star

(C) Parabolic

(D) Sief

95. Match the metalogenic terms of Column I with their descriptions given in Column II :

Column I

(*a*) Syngenetic

(*b*) Hypogene

(*c*) Epigenetic

(*d*) Supergene

Column II

(P) Ores and minerals formed at the same time as their host rocks

(Q) Ore formation by descending solutions

(R) Ores emplaced into pre-existing rocks of any origin

(S) Ores formed by ascending solutions

(T) Concentration caused by processes in the Earth's interior

Codes :

	(*a*)	(*b*)	(*c*)	(*d*)
(A)	(P)	(S)	(R)	(Q)
(B)	(P)	(R)	(S)	(T)
(C)	(P)	(T)	(R)	(Q)
(D)	(S)	(Q)	(P)	(R)

96. Cyprus type Cu-Zn deposits are found in :
(A) Island arcs
(B) Passive continental margins
(C) Mid oceanic ridges
(D) Continental rifts

97. Choose the *correct* combination of ore and location of its deposit :
(A) Uranium — Jaduguda
(B) Lead — Khetri
(C) Gold — Panna
(D) Iron — Malanjkhand

98. Match the following :

List I

(1) Dissemination
(2) Segregation
(3) Residual liquid segregation
(4) Residual liquid injection

List II

(*i*) Chromite deposit of Keonjhar (Odisha)
(*ii*) Titaniferous magnetite deposit of Adivondaek region of New York
(*iii*) Diamond deposit of Panna
(*iv*) Titaniferous magnetite bands of Bushveld Complex

Codes :

	(1)	(2)	(3)	(4)
(A)	(*iii*)	(*i*)	(*iv*)	(*ii*)
(B)	(*ii*)	(*iii*)	(*iv*)	(*i*)
(C)	(*i*)	(*ii*)	(*iii*)	(*iv*)
(D)	(*iii*)	(*i*)	(*ii*)	(*iv*)

99. Analysis of coal that involves determination of weight percentage of carbon, sulfur, nitrogen and oxygen is called :
(A) Substrate
(B) Clariviate
(C) Ultimate
(D) Proximate

100. The Alpine-Himalayan orogenic belt characterizes the focal depths for :
(A) Deep Earthquakes (700 to 400 km)
(B) Shallow Earthquakes (< 100 km)
(C) Intermediate Earthquakes (300-100 km)
(D) Shallow Earthquakes (< 5 km)

ROUGH WORK