

Test Booklet Code & Serial No.

प्रश्नपत्रिका कोड व क्रमांक

Paper-II**B****EARTH, ATMOSPHERIC, OCEAN & PLANETARY SCIENCE****Signature and Name of Invigilator**

Seat No.

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(In figures as in Admit Card)

1. (Signature)

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OMR Sheet No.

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(To be filled by the Candidate)

APR - 35217**Time Allowed : 1¼ Hours]****[Maximum Marks : 100****Number of Pages in this Booklet : 12****Number of Questions in this Booklet : 50****Instructions for the Candidates**

- Write your Seat No. and OMR Sheet No. in the space provided on the top of this page.
- This paper consists of **50** objective type questions. Each question will carry *two* marks. *All* questions of Paper-II will be compulsory, covering entire syllabus (including all electives, without options).
- 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 :
 - 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.
 - 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.**
 - After this verification is over, the OMR Sheet Number should be entered on this Test Booklet.
- 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.

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| (A) | (B) | (C) | (D) |
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- 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.
- Read instructions given inside carefully.
- Rough Work is to be done at the end of this booklet.
- 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.
- 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.
- Use only Blue/Black Ball point pen.**
- Use of any calculator or log table, etc., is prohibited.**
- There is no negative marking for incorrect answers.**

विद्यार्थ्यासाठी महत्वाच्या सूचना

- परिक्षार्थीनी आपला आसन क्रमांक या पृष्ठावरील वरच्या कोपऱ्यात लिहावा. तसेच आपणांस दिलेल्या उत्तरपत्रिकेचा क्रमांक त्याखाली लिहावा.
- सदर प्रश्नपत्रिकेत **50** बहुपर्यायी प्रश्न आहेत. प्रत्येक प्रश्नास **दोन** गुण आहेत. या प्रश्नपत्रिकेतील **सर्व** प्रश्न सोडविणे अनिवार्य आहे. सदरचे प्रश्न हे या विषयाच्या संपूर्ण अभ्यासक्रमावर आधारित आहेत.
- परीक्षा सुरु झाल्यावर विद्यार्थ्याला प्रश्नपत्रिका दिली जाईल. सुरुवातीच्या 5 मिनीटांमध्ये आपण सदर प्रश्नपत्रिका उघडून खालील बाबी अवश्य तपासून पहाव्यात.
 - प्रश्नपत्रिका उघडण्यासाठी प्रश्नपत्रिकेवर लावलेले सील उघडावे. सील नसलेली किंवा सील उघडलेली प्रश्नपत्रिका स्विकारू नये.
 - 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.
 - वरीलप्रमाणे सर्व पडताळून पहिल्यानंतरच प्रश्नपत्रिकेवर ओ.एम.आर. उत्तरपत्रिकेचा नंबर लिहावा.
- प्रत्येक प्रश्नासाठी (A), (B), (C) आणि (D) अशी चार विकल्प उत्तरे दिली आहेत. त्यातील योग्य उत्तराचा रकाना खाली दर्शविल्याप्रमाणे ठळकपणे काळ/निळा करावा.
उदा. : जर (C) हे योग्य उत्तर असेल तर.

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| (A) | (B) | (C) | (D) |
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- या प्रश्नपत्रिकेतील प्रश्नांची उत्तरे **ओ.एम.आर. उत्तरपत्रिकेतच दर्शवावीत**. इतर ठिकाणी लिहीलेली उत्तरे तपासली जाणार नाहीत.
- आत दिलेल्या सूचना काळजीपूर्वक वाचाव्यात.
- प्रश्नपत्रिकेच्या शेवटी जोडलेल्या कोऱ्या पानावरच कच्चे काम करावे.
- जर आपण ओ.एम.आर. वर नमूद केलेल्या ठिकाणा व्यतिरिक्त इतर कोठेही नाव, आसन क्रमांक, फोन नंबर किंवा ओळख पटले अशी कोणतीही खूण केलेली आढळून आल्यास अथवा असभ्य भाषेचा वापर किंवा इतर गैरमार्गाचा अवलंब केल्यास विद्यार्थ्याला परीक्षेस अपात्र ठरविण्यात येईल.
- परीक्षा संपल्यानंतर विद्यार्थ्याने मूळ ओ.एम.आर. उत्तरपत्रिका पर्यवेक्षकांकडे परत करणे आवश्यक आहे. तथापी, प्रश्नपत्रिका व ओ.एम.आर. उत्तरपत्रिकेची द्वितीय प्रत आपल्याबरोबर नेण्यास विद्यार्थ्यांना परवानगी आहे.
- फक्त निळा किंवा काळ्या बॉल पेनचाच वापर करावा.**
- कॅलक्युलेटर किंवा लॉग टेबल वापरण्यास परवानगी नाही.**
- चुकीच्या उत्तरासाठी गुण कपात केली जाणार नाही.**

APR - 35217/II—B

Earth, Atmospheric, Ocean and Planetary Science

Paper II

Time Allowed : 75 Minutes]

[Maximum Marks : 100

Note : This paper contains **Fifty (50)** multiple choice questions. Each question carries **Two (2)** marks. Attempt *All* questions.

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| <p>1. The accumulation of daily and seasonal weather events over a long period of time scale :</p> <p>(A) Diurnal weather</p> <p>(B) Climate</p> <p>(C) Weather</p> <p>(D) Season</p> <p>2. An extensive ocean warming that begins along the coast of Peru and Equator :</p> <p>(A) La-Nina</p> <p>(B) Sea surface temperature</p> <p>(C) Ocean nino index</p> <p>(D) El-Nino</p> | <p>3. Which of the following statements is <i>true</i> ?</p> <p>(A) Dry air is denser than moist air</p> <p>(B) Moist air is denser than dry air</p> <p>(C) Dry air temperature is always more than moist air temperature</p> <p>(D) Relative humidity of moist air is always higher than dry air</p> <p>4. Cirrus clouds occur in the height range of :</p> <p>(A) 1–2 km</p> <p>(B) 2–5 km</p> <p>(C) 12–18 km</p> <p>(D) 6–12 km</p> |
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| <p>5. Among the four atmospheric constituents N_2, O_2, Ar and O_3, has least fractional concentration.</p> <p>(A) O_2</p> <p>(B) O_3</p> <p>(C) N_2</p> <p>(D) Ar</p> <p>6. The spectral region of the electromagnetic radiation which passes through the atmosphere without much attenuation is known as :</p> <p>(A) Ozone hole</p> <p>(B) Atmospheric window</p> <p>(C) Ozone window</p> <p>(D) Black hole</p> <p>7. Occurrence of sargur group indicates the antiquity of :</p> <p>(A) East Dharwar Craton</p> <p>(B) West Dharwar Craton</p> <p>(C) Singhbhum Craton</p> <p>(D) Bastar Craton</p> | <p>8. The Eastern Ghat Mobile belts are defined as :</p> <p>(A) Early Proterozoic</p> <p>(B) Middle Proterozoic</p> <p>(C) Archean</p> <p>(D) Mesozoic</p> <p>9. The <i>correct</i> chronological order (older to younger) of the following geological units is :</p> <p>(1) Talchir tillite</p> <p>(2) Muth quartzite</p> <p>(3) Umia ammonite bed</p> <p>(4) Mahadeva</p> <p>(A) 2, 1, 4, 3</p> <p>(B) 1, 2, 3, 4</p> <p>(C) 2, 3, 1, 4</p> <p>(D) 4, 3, 2, 1</p> <p>10. The limestone-shale succession above the Panjal traps is described as :</p> <p>(A) Syringothyris limestone</p> <p>(B) Zewan beds</p> <p>(C) Muschelkalk beds</p> <p>(D) None of the above</p> |
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| <p>11. Age of the oldest pelagic sediments on the present sea floor is :</p> <p>(A) Late Jurassic</p> <p>(B) Early Pleistocene</p> <p>(C) Ordovician</p> <p>(D) Permian</p> <p>12. The 90° East ridge in the Indian ocean is an example of :</p> <p>(A) Failed rift</p> <p>(B) Ocean plate folding</p> <p>(C) Aseismic ridge</p> <p>(D) Plate buckle</p> <p>13. The major unconformity during Cambro-Ordovician sequences in the Himalaya is supposed to be the effect of :</p> <p>(A) Closure of Tethys</p> <p>(B) Pan African Orogeny</p> <p>(C) Global sea level fall</p> <p>(D) Global cooling</p> | <p>14. Photochemistry of the upper atmosphere occurs because of of the O₂, N₂ and O₃ that is present.</p> <p>(A) Photolysis</p> <p>(B) Hydrolysis</p> <p>(C) Hydration</p> <p>(D) Solarysis</p> <p>15. Flood magnitude can be measured as the elevation to which a river rises during a flood, but more commonly it is reported as the maximum of the stream during the event.</p> <p>(A) Surcharge</p> <p>(B) Surge</p> <p>(C) Discharge</p> <p>(D) Recharge</p> <p>16. Inclinations of the earth's magnetic field varies as a function of :</p> <p>(A) Lattitudes</p> <p>(B) Longitudes</p> <p>(C) Altitudes</p> <p>(D) Time</p> |
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| <p>17. The inner core comprises of :</p> <p>(A) Solid Fe and Mg</p> <p>(B) Liquid Fe and Ni</p> <p>(C) Solid Fe and Ni</p> <p>(D) Solid Fe, Liquid Ni and S</p> <p>18. To develop a good soil profile in a dry climate it takes about years.</p> <p>(A) 10,000 to 1,00,000</p> <p>(B) 100 to 400</p> <p>(C) 400 to 800</p> <p>(D) 800 to 1600</p> <p>19. Island arcs are developed at the :</p> <p>(A) Destructive plate margins</p> <p>(B) Constructive plate margins</p> <p>(C) Conservative plate margins</p> <p>(D) Continental rifts</p> | <p>20. Spinel transformation to Mg-perovskite with the iron going into a Mg-Wustite structure takes place at the depth boundary of the lower mantle.</p> <p>(A) 650 km</p> <p>(B) 400 km</p> <p>(C) 530 km</p> <p>(D) 250 km</p> <p>21. Which of the following is <i>correct</i> statements of speed of seismic waves ?</p> <p>(A) $V_R > V_L > V_S > V_P$</p> <p>(B) $V_S > V_P > V_L > V_R$</p> <p>(C) $V_P > V_S > V_L > V_R$</p> <p>(D) $V_L > V_R > V_P > V_S$</p> <p>22. Which of the following is the largest H₂O reservoir on the earth ?</p> <p>(A) The oceans</p> <p>(B) Streams and lakes</p> <p>(C) Glaciers/ice</p> <p>(D) The water vapour in the atmosphere</p> |
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| <p>23. When moving into shallow water, deep water waves become</p> <p>(A) S-waves</p> <p>(B) Rayleigh waves</p> <p>(C) Waves of oscillation</p> <p>(D) Waves of translation</p> | <p>26. The primary factor that actually determines the stream water to flow in a laminar or turbulent is :</p> <p>(A) Stream depth</p> <p>(B) Water temperature</p> <p>(C) Stream width</p> <p>(D) Stream velocity</p> |
| <p>24. The part of the shoreline between high and low tides sometimes refers to as :</p> <p>(A) Littoral zone</p> <p>(B) Sublittoral zone</p> <p>(C) Bathyal zone</p> <p>(D) Abyssal zone</p> | <p>27. Which of the following materials has the lowest porosity ?</p> <p>(A) Shale</p> <p>(B) Gravel</p> <p>(C) Granite</p> <p>(D) Sandstone</p> |
| <p>25. An ocean water wave is energy, that is the direct result of the transfer of energy, from which source ?</p> <p>(A) Gravity</p> <p>(B) River water entering the oceans</p> <p>(C) Wind</p> <p>(D) Earth's rotation</p> | <p>28. Magnetic field of the earth is generated in the :</p> <p>(A) Outer core</p> <p>(B) Inner core</p> <p>(C) Sun</p> <p>(D) Crust</p> |

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| <p>29. Which of the following is <i>not</i> proof of sea floor spreading ?</p> <p>(A) Parallel magnetic reversal zones on ocean floor</p> <p>(B) Systematic younging of ocean floor from coast towards MOR</p> <p>(C) Transform of faults and active volcanism</p> <p>(D) Continental coastal outlines of major oceans</p> <p>30. The mid-Atlantic ridge is exposed above sea level at :</p> <p>(A) Geneva</p> <p>(B) Iceland</p> <p>(C) Bornea</p> <p>(D) Cuba</p> <p>31. If 'n' is the planet number starting from sun as '0', the Titius-Bode's law states that the distances in Astronomical units from the sun occur as equal to :</p> <p>(A) $5n + 3n^2 + 2n^3$</p> <p>(B) $2^{n-2} \times 3\pi$</p> <p>(C) $0.4 + 0.6 \times n^2$ where $n \geq 1$</p> <p>(D) $0.4 + 0.3 \times 2^{n-2}$ where $n \geq 2$</p> | <p>32. The P-wave making a complete traverse from crust-mantle-core and back to crust is denoted as :</p> <p>(A) PKIKP</p> <p>(B) PKICIKP</p> <p>(C) PCMCP</p> <p>(D) CMCMC</p> <p>33. That the stars and galaxies are moving away, and their speeds can be obtained by the Doppler effect is the characteristic of :</p> <p>(A) Blue shift</p> <p>(B) Red shift</p> <p>(C) Yellow shift</p> <p>(D) Violet shift</p> <p>34. The pressure at the bottom of the continental crust of an average thickness of 36 km is :</p> <p>(A) 9.54 kbar</p> <p>(B) 15 kbar</p> <p>(C) 5.94 kbar</p> <p>(D) 20 kbar</p> |
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35. Depth at which seawater reaches equilibrium with aragonite or calcite is called
- (A) Isocline depth
(B) Lysocline depth
(C) Isostatic depth
(D) Isoleismic depth
36. Which type of water exists as continuous film around the soil particles ?
- (A) Hydromorphic
(B) Hygroscopic
(C) Capillary
(D) Gravitational
37. Chrome rich green garnet is :
- (A) Uvarovite
(B) Pyrope
(C) Grossularite
(D) Andradite
38. The most stable form of manganese mineral in the complete range of pH of secondary environment is :
- (A) $\text{Mn}(\text{OH})_2$
(B) MnOOH
(C) MnO_2
(D) Mn_3O_4
39. The most common sediment covering the deep ocean floor is
- (A) Sand
(B) Gravel
(C) Calcareous ooze
(D) Siliceous ooze
40. Which of the following statements is *not true* ?
- (A) In strike slip fault, sense of movement is parallel to strike of the fault plane
(B) Transform fault are not strike slip faults
(C) Dextral and sinistral are types of slips along a strike slip fault
(D) San-Andreas fault of California is a strike slip fault

41. Which of the following objects on deformation can be best suited to analyse strain. Select appropriate answer :

- (A) Pebbles from deformed conglomerate
- (B) Fossil molluscs
- (C) Feldspar phonocrysts
- (D) All of the above

42. In karst topography a compound doline or a chain of intersecting dolines are known as :

- (A) Blind Valley
- (B) Cavern
- (C) Cock-pit
- (D) Uvala

43. One of the following causes mobile beaches to change their orientation so that the plan view of the shoreline closely confirms with the shape of wavefront :

- (A) Reflection
- (B) Deflection
- (C) Refraction
- (D) Inclination

44. In addition to their use as starting materials in the production of herbicides, chlorophenols are used as

- (A) Fungicides
- (B) Pesticides
- (C) Antacides
- (D) Germicides

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| <p>45. Most deep-ocean trenches are located in the :</p> <p>(A) Pacific ocean</p> <p>(B) Indian ocean</p> <p>(C) Atlantic ocean</p> <p>(D) Gulf of Mexico</p> <p>46. The movement of water parallel to the shore within the surf zone is termed :</p> <p>(A) Longshore current</p> <p>(B) Rip current</p> <p>(C) Beach drift</p> <p>(D) Tidal current</p> <p>47. Sand dunes on coasts commonly are :</p> <p>(A) Star and Barchan Dunes</p> <p>(B) Parabolic and Blowout Dunes</p> <p>(C) Linear and Star Dunes</p> <p>(D) Barchan and Dome Dunes</p> | <p>48. One of the following is the most common process of erosion :</p> <p>(A) Abrasion</p> <p>(B) Attrition</p> <p>(C) Quarrying</p> <p>(D) Plucking</p> <p>49. Lahar is a type of :</p> <p>(A) Solifluction</p> <p>(B) Gelifluction</p> <p>(C) Debris flow</p> <p>(D) Soil creep</p> <p>50. An intense rotating column of air that protrudes from a cumulo-nimbus cloud in the shape of funnel whose circulation is on the earth surface :</p> <p>(A) Thunderstorm</p> <p>(B) Typhoon</p> <p>(C) Tornadoes</p> <p>(D) Cyclone</p> |
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APR - 35217/II—B

ROUGH WORK