

Test Booklet Code &amp; No.

प्रश्नपत्रिका कोड व क्र.

**A****Paper-II****EARTH, ATMOSPHERIC, OCEAN AND PLANETARY SCIENCE****Signature and Name of Invigilator**

Seat No.

--	--	--	--	--	--

(In figures as in Admit Card)

1. (Signature) .....

(Name) .....

Seat No. ....

(In words)

2. (Signature) .....

(Name) .....

OMR Sheet No.

--	--	--	--	--	--

(To be filled by the Candidate)

**MAY - 35216****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.  

(A)	(B)	(C)	(D)
-----	-----	-----	-----
- 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.**

**विद्यार्थ्यांसाठी महत्वाच्या सूचना**

- परिक्षार्थींनी आपला आसन क्रमांक या पृष्ठवरील 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 सुरू 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/निळ करवा.  
**उदा. :** जर (C) हे योग्य उत्तर असेल तर.  

(A)	(B)	(C)	(D)
-----	-----	-----	-----
- या प्रश्नपत्रिकेतील प्रश्नांची उत्तरे **ओ.एम.आर. उत्तरपत्रिकेतच दर्शवावीत**. इतर ठिकाणी लिहिलेली 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 पटेल अशी कोणतीही खूण केलेली आढळून आल्यास अथवा असभ्य भाषेचा वापर किंवा इतर गैरमागाचा 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 निळ्या किंवा काळ्या बॉल पेनचाच वापर करावा.**
- कॅलक्युलेटर किंवा लॉग टेबल वापरण्यास परवानगी नाही.**
- चुकीच्या उत्तरासाठी गुण कपात केली जाणार नाही.**

**MAY - 35216/II—A**

## 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.

- |   |  |
|---|--|
| <p>1. The general expression to derive the velocity of Seismic wave is :</p> <p>(A) <math>\sqrt{\left(\frac{\text{Elastic modulus}}{\text{Density}}\right)}</math></p> <p>(B) <math>\frac{\sqrt{\text{Elastic modulus}}}{(\text{Density})^2}</math></p> <p>(C) <math>\frac{\text{Young's Modulus}}{\sqrt{\text{Density}}}</math></p> <p>(D) <math>\sqrt{\frac{\text{Density}}{\text{Elasticity}}}</math></p> <p>2. Ore deposits of Khetri are known for :</p> <p>(A) Aluminium</p> <p>(B) Copper</p> <p>(C) Magnesium</p> <p>(D) Gold</p> <p>3. Orogenic belts are formed by :</p> <p>(A) Extensional tectonics</p> <p>(B) Compressional tectonics</p> <p>(C) Transtension tectonics</p> <p>(D) Extensional followed by strike-slip tectonics</p> | <p>4. Oxbow lakes are commonly seen near :</p> <p>(A) Water falls</p> <p>(B) Meandering rivers</p> <p>(C) Delta</p> <p>(D) Sea coasts</p> <p>5. Ajanta and Ellora caves are engraved in rocks of :</p> <p>(A) Deccan Basalt</p> <p>(B) Makrana marble</p> <p>(C) Oolitic limestone</p> <p>(D) Khondalite</p> <p>6. The Supercontinent that rifted apart at the end of the proterozoic is :</p> <p>(A) Pangea</p> <p>(B) Gondwana</p> <p>(C) Rodinia</p> <p>(D) Laurentia</p> |
|---|--|

7. The plutonic equivalent of phonolite is :

- (A) Syenite
- (B) Nepheline syenite
- (C) Adamellite
- (D) Monzonite

8. The characteristic terrain of karst topography is :

- (A) granitic
- (B) limestone
- (C) basaltic
- (D) sandstone

9. In extensional tectonic regime, we usually find :

- (A) Normal faults
- (B) Thrusts
- (C) Folds and thrusts
- (D) Folds

10. Which one of the following properties can not be observed using a petrological microscope ?

- (A) Extinction angle
- (B) Interference colour
- (C) Lustre
- (D) Pleochroism

11. The condition for conditional instability is :

- (A)  $\Gamma_d < \Gamma < \Gamma_s$
- (B)  $\Gamma_s < \Gamma < \Gamma_d$
- (C)  $\Gamma_s < \Gamma_d < \Gamma$
- (D)  $\Gamma_d < \Gamma_s < \Gamma$

where  $\Gamma_d$  is the dry adiabatic lapse rate,  $\Gamma_s$  is the saturated adiabatic lapse rate and  $\Gamma$  is the environmental lapse rate.

12. The mafic minerals contain more of :

- (A) Al and Si
- (B) Mg and Fe
- (C) Ca and Cu
- (D) Mn and Al

- |   |  |
|---|--|
| <p>13. The boundary between upper mantle and lower mantle is located at :</p> <p>(A) 2900 km</p> <p>(B) 410 km</p> <p>(C) 150 km</p> <p>(D) 660 km</p>  | <p>16. Geoid is :</p> <p>(A) Physical surface of acceleration due to gravity</p> <p>(B) Spherical surface of the earth</p> <p>(C) Physical equipotential surface of gravity on earth</p> <p>(D) Ellipsoidal surface of the earth</p> |
| <p>14. Which of the following radioactive isotopes has the longest half-life ?</p> <p>(A) 87 Rb</p> <p>(B) 40 K</p> <p>(C) 14 C</p> <p>(D) 238 U</p>  | <p>17. All the planets rotate about their rotation axis in the same sense termed prograde except one planet in opposite sense (retrograde) which is :</p> <p>(A) Jupiter</p> <p>(B) Mars</p> <p>(C) Saturn</p> <p>(D) Venus</p>      |
| <p>15. Global transgression and regression cycles can be caused by :</p> <p>(A) Major tectonic event</p> <p>(B) Meteorite impact</p> <p>(C) Unusual lunar tidal cycles</p> <p>(D) Major Tsunami event</p> | <p>18. Kimberlite pipes are explored for :</p> <p>(A) Diamond</p> <p>(B) Beryl</p> <p>(C) Corundum</p> <p>(D) Quartz</p>   |

- |  |   |
|--|---|
| <p>19. In the lowest 10 km of the earth's atmosphere in tropical regions, air temperature in general :</p> <p>(A) Increases with height</p> <p>(B) Remains constant with height</p> <p>(C) Decreases with height</p> <p>(D) Decreases upto 5 km and then increases</p> <p>20. Geostrophic wind results due to balance of which of the following forces :</p> <p>(A) Coriolis force and centrifugal force</p> <p>(B) Coriolis force and pressure gradient force</p> <p>(C) Pressure gradient force and centrifugal force</p> <p>(D) Pressure gradient force and gravitational force</p> | <p>21. The global mean concentration of atmospheric CO<sub>2</sub> is presently close to :</p> <p>(A) 400 ppmv</p> <p>(B) 350 ppmv</p> <p>(C) 450 ppmv</p> <p>(D) 300 ppmv</p> <p>22. To produce precipitation in cold clouds by artificial modification, the following is used as ice nuclei :</p> <p>(A) Silver chloride</p> <p>(B) Silver iodide</p> <p>(C) Potassium iodide</p> <p>(D) Potassium chloride</p> <p>23. Anticyclones in the wind plots are :</p> <p>(A) Clockwise circulation 5°N to 5°S of the equator</p> <p>(B) Anticlockwise circulation 5°N to 5°S of the equator</p> <p>(C) Clockwise circulation in the southern hemisphere</p> <p>(D) Clockwise circulation in the northern hemisphere</p> |
|--|---|

- |  |   |
|--|---|
| <p>24. Fjords are characterized by :</p> <ul style="list-style-type: none"> <li>(A) irregular glaciated coast</li> <li>(B) glaciated submerged coast</li> <li>(C) emergent glaciated coast</li> <li>(D) dissected sea coast</li> </ul> <p>25. Which one of the following statements is <i>true</i> for ocean water ?</p> <ul style="list-style-type: none"> <li>(A) The pycnocline is a zone of increasing density with depth</li> <li>(B) The pycnocline is a zone of decreasing density with depth</li> <li>(C) The halocline is a zone of decreasing salinity with depth</li> <li>(D) The thermocline is a zone of increasing temperature with depth</li> </ul> <p>26. New sea floor is created at :</p> <ul style="list-style-type: none"> <li>(A) deep sea trench</li> <li>(B) mid-oceanic ridge</li> <li>(C) subduction zone</li> <li>(D) transform fault</li> </ul> | <p>27. Coastal upwelling result in :</p> <ul style="list-style-type: none"> <li>(A) warm water surfacing</li> <li>(B) nutrient rich water surfacing</li> <li>(C) mixing of salt and fresh water</li> <li>(D) lowering of high tides</li> </ul> <p>28. The ratio of volume of voids to the total volume of a rock/soil is called :</p> <ul style="list-style-type: none"> <li>(A) Permeability</li> <li>(B) Porosity</li> <li>(C) Absolute porosity</li> <li>(D) Hydraulic conductivity</li> </ul> <p>29. The last reversal of the Earth's magnetic field occurred at :</p> <ul style="list-style-type: none"> <li>(A) 1,00,000 years</li> <li>(B) 50,000 years</li> <li>(C) 3,00,000 years</li> <li>(D) 7,80,000 years</li> </ul> |
|--|---|

- |   |   |
|---|---|
| <p>30. The most common of all transform faults is :</p> <p>(A) trench-trench transform fault</p> <p>(B) ridge-ridge transform fault</p> <p>(C) ridge-trench transform fault</p> <p>(D) ridge trench-ridge transform fault</p> <p>31. The Andean style margins typically characterize :</p> <p>(A) divergent tectonics</p> <p>(B) convergent tectonics</p> <p>(C) extension tectonics</p> <p>(D) inversion tectonics</p> <p>32. A light coloured, fine-grained sedimentary rock formed mainly of the remains of siliceous microfossils is known as :</p> <p>(A) diatomite</p> <p>(B) encrinite</p> <p>(C) chalk</p> <p>(D) diorite</p> | <p>33. The sedimentary rock without stratification is :</p> <p>(A) sandstone</p> <p>(B) limestone</p> <p>(C) tillite</p> <p>(D) shale</p> <p>34. Which one of the following landforms occur in North America and Europe but not in India ?</p> <p>(A) Cirques and glacial troughs</p> <p>(B) Medial and lateral moraines</p> <p>(C) Hanging valleys and U-shaped valleys</p> <p>(D) Drumlins and eskers</p> |
|---|---|



35. When sodium carbonate and bicarbonate predominate among salts with resultant exchangeable Na-ions, then the soil is called :

- (A) sodic soil
- (B) acidic soil
- (C) black soil
- (D) red soil

36. Replacement ore deposits formed along the contact of carbonate rich sediments by contact pyrometamorphism are called as :

- (A) Hydrothermal
- (B) Skarn
- (C) Magmatic differentiation
- (D) Diagenetic

37. Rapakivi texture is characterized by :

- (A) Plagioclase mantled by orthoclase
- (B) Plagioclase rimmed by hornblende
- (C) Orthoclase mantled by plagioclase
- (D) Orthoclase rimmed by hornblende

38. The hardest mineral with highest brilliancy is :

- (A) Diamond
- (B) Calcite
- (C) Fluorite
- (D) Apatite

39. Stishovite is a polymorph of :

- (A) Olivine
- (B) Plagioclase
- (C) garnet
- (D) Quartz

40. Which one of the following is an autotroph ?

- (A) Foraminifera
- (B) Gastropods
- (C) Fishes
- (D) Diatoms

41. The average Bouguer anomaly for the ocean as a whole is :

- (A) Positive
- (B) Negative
- (C) Zero
- (D) Unpredictable

42. According to Wentworth's scale particles having a diameter between 4-64 mm are described as :

- (A) Granules
- (B) Pebbles
- (C) Cobbles
- (D) Coarse sands

43. In Rajasthan groundwater resources are contaminated with :

- (A) Iodine
- (B) Fluoride
- (C) Heavy metals
- (D) Sulphides

44. Slow outward and downward movement of rock material is described as :

- (A) Creep
- (B) Landslide
- (C) Flow
- (D) Rock glide

- |   |  |
|---|--|
| <p>45. Sedimentary rocks containing trapped water is known as :</p> <p>(A) Meteoric water</p> <p>(B) Juvenile water</p> <p>(C) Connate water</p> <p>(D) Well water</p> <p>46. The Indo-Gangetic basin is a :</p> <p>(A) Fore land basin</p> <p>(B) Rifted basin</p> <p>(C) Intracontinental basin</p> <p>(D) Pull-apart basin</p> <p>47. The age of Marine beds associated with lower Gondwana rocks is :</p> <p>(A) Early Traissic</p> <p>(B) Late Jurrasic</p> <p>(C) Early cretaceous</p> <p>(D) Early permian</p> | <p>48. The bulk composition of Deccan lavas are :</p> <p>(A) Andesitic</p> <p>(B) Tholeiitic</p> <p>(C) Calc-alkaline</p> <p>(D) Alkaline</p> <p>49. Stromatolites are :</p> <p>(A) Green algae</p> <p>(B) Blue algae</p> <p>(C) Organo-sedimentary structures</p> <p>(D) Chemical structure</p> <p>50. The principal source rock of hydrocarbons in Mumbai offshore basin :</p> <p>(A) Daman Formation</p> <p>(B) Chinchini Formation</p> <p>(C) Panna Formation</p> <p>(D) Ratnagiri Formation</p> |
|---|--|

**MAY - 35216/II—A**

**ROUGH WORK**