

Test Booklet Code & Serial No.

प्रश्नपत्रिका कोड व क्रमांक

Paper-II

A

EARTH, ATMOSPHERIC, OCEAN & PLANETARY SCIENCE

Signature and Name of Invigilator

1. (Signature) .....

(Name) .....

2. (Signature) .....

(Name) .....

JAN - 35218

Time Allowed : 1½ Hours]

Number of Pages in this Booklet : 12

Seat No. 

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(In figures as in Admit Card)

Seat No. ....

(In words)

OMR Sheet No. 

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(To be filled by the Candidate)

[Maximum Marks : 100

Number of Questions in this Booklet : 50

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 **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).
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.



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.**

1. परीक्षार्थीनी आला आसन क्रमांक या पृष्ठावरील वरच्या कोपन्यात लिहावा. तसेच आपांना दिलेल्या उत्तरपत्रिकेचा क्रमांक त्याखाली लिहावा.
2. सदर प्रश्नपत्रिकेत 50 बहुपर्यायी प्रश्न आहेत. या प्रश्नपत्रिकेतील सर्व प्रश्न सोडविणे अनिवार्य आहे. सदरचे प्रश्न हे या विषयाच्या संपूर्ण अभ्यासक्रमावर आधारित आहेत.
3. परीक्षा सुरु झाल्यावर विद्यार्थ्याला प्रश्नपत्रिका दिली जाईल. सुरुवातीच्या 5 मिनीटांमध्ये आपण सदर प्रश्नपत्रिका उघडून खालील बाबी अवश्य तपासून पहाव्या.
  - (i) प्रश्नपत्रिका उघडण्यासाठी प्रश्नपत्रिकेवर लावलेले सील उघडावे. सील नसलेली किंवा सील उघडलेली प्रश्नपत्रिका स्विकारू नये.
  - (ii) पहिल्या पृष्ठावर नमूद कल्याप्रमाणे प्रश्नपत्रिकेची एकूण पृष्ठे तसेच प्रश्नपत्रिकेतील एकूण प्रश्नांची संख्या पडताळून पहावी. पृष्ठे कमी असलेली/कमी प्रश्न असलेली/प्रश्नांचा चूकाचा क्रम असलेली किंवा इतर त्रुटी असलेली सदोष प्रश्नपत्रिका सुरुवातीच्या 5 मिनीटात याचे क्रमांक परत देऊन दुसरी प्रश्नपत्रिका मागवून घ्यावी. त्यानंतर प्रश्नपत्रिका बदलून मिळणार नाही तसेच वेळी बाढवून मिळणार नाही याची कृपया विद्यार्थ्यांनी नोंद घ्यावी.
  - (iii) वरीलप्रमाणे सर्व पडताळून पहिल्यानंतरच 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 काढा/निन्दा करावा.
- उदा.: जर (C) हे योग्य उत्तर असेल तर.
5. या प्रश्नपत्रिकेतील प्रश्नांची उत्तर ओ.एम.आर. उत्तरपत्रिकेतच दर्शवावीत. इतर टिकाणी लिहीलेली उत्तर तापसीनी जाणार नाहीत.
6. आत दिलेल्या सचना काळजीपूर्वी वाचाव्यात.
7. प्रश्नपत्रिकेच्या शेवटी जोडलेल्या को-या पानावरच कच्चे काम करावे.
8. जर आपण ओ.एम.आर. वर नमूद कलेलेल्या टिकाणा व्यतिरीकृत इतर कोठेही नाव, आसन क्रमांक, फोन नंबर किंवा ओळख पटेल अशी कोणतीही खण केलेली आढळून आल्याचा अथवा असभ्य भाषेचा वापर किंवा इतर गैरमागांचा अवलब केल्यास विद्यार्थ्यांना परीक्षेस अपात्र घरविण्यात येईल.
9. परीक्षा संपल्यानंतर विद्यार्थ्यांनी मळ ओ.एम.आर. उत्तरपत्रिका पर्यवेक्षकांकडे परत करणे आवश्यक आहे. तथापी, प्रश्नपत्रिका व ओ.एम.आर. उत्तरपत्रिकेची द्वितीय प्रत आपल्याबोरोबर नेण्यास विद्यार्थ्यांना परवानगी आहे.
10. फुल निळ्या किंवा काळ्या बॉल पेनचाच वापर करावा.
11. कलक्युलेटर किंवा लॉग टेबल वापरण्यास परवानगी नाही.
12. चुकीच्या उत्तरासाठी गुण कपात केली जाणार नाही.

**JAN - 35218/II—A**

**EARTH, ATMOSPHERIC, OCEAN & 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. Kepler's Second Law of planetary motion states that orbital radius of a planet sweeps out :</p> <p>(A) Equal area in equal orbits<br/>(B) Larger area in smaller orbits<br/>(C) Equal areas in equal interval of time<br/>(D) Smaller area in larger time interval</p> <p>2. Sampling the same place with seismic waves arriving from different directions and producing the anomalies is the basic principle of :</p> <p>(A) Seismic Inversion<br/>(B) Seismic Tomography<br/>(C) Seismic Reflection<br/>(D) Seismic Refraction</p> | <p>3. A cylinder of length 'L' and diameter 'D' when subjected to a tensile stress parallel to L would be elongated in length, but the same time shortened in diameter and is expressed by :</p> <p>(A) Rigidity Modulus<br/>(B) Poisson's Ratio<br/>(C) Stretching Constant<br/>(D) Tensile Strength</p> <p>4. Aluminium saturation index determines whether a rock is metaaluminous or peraluminous, the peraluminous rocks contain aluminous minerals including muscovite, garnet sillimanite and ...</p> <p>(A) Cordierite<br/>(B) Coesite<br/>(C) Covanzite<br/>(D) Comingtonite</p> |
|--|---|

5. The composition of sapphire is :

- (A)  $\text{Al}_2\text{O}_3$
- (B)  $\text{CaTiO}_3$
- (C)  $\text{Al}_2\text{SiO}_5$
- (D)  $\text{Al}_2(\text{OH})\text{Si}_2\text{O}_7$

6. Find the odd one out :

- (A) Omphacite - Eelogite
- (B) Glaucophane - Blue schist
- (C) Laumontite - Zeolite
- (D) Hypersthene - Greenschist

7. Which of the following are the typical marine biogenic sediment types ?

- (A) Pelagic muds & turbidites
- (B) Calcareous Ooze & Siliceous Oozes
- (C) Calcareous sandstone and sandy limestone
- (D) none of the above

8. There are different types of coal. Two of them release a great deal of pollutants into the air whereas the third releases less smoke is considered to be less polluting. Name the less polluting type of coal :

- (A) Lignite
- (B) Anthracite
- (C) Bituminous
- (D) Sub-bituminous

9. Which of the following minerals is a ring silicate ?

- (A) Pyrophyllite
- (B) Enstatite
- (C) Forsterite
- (D) Tourmaline

10. Thick deposits of homogeneous, wind transported unstratified silt in middle latitudes is generally known as :

- (A) Ergs
- (B) Loess
- (C) Eolianite
- (D) Draas

11. Stream competence primarily depends up :

- (A) Amount of suspended load
- (B) Water temperature
- (C) Channel shape
- (D) Flow velocity

12. Hydrograph is a graph of discharge plotted against :

- (A) Channel width
- (B) Channel depth
- (C) Channel velocity
- (D) Time

13. A blind valley is a type of :

- (A) Glacial Valley
- (B) Karst Valley
- (C) Rift Valley
- (D) Intermontane Valley

14. Match the following :

**Type of Coral              Properties**

**Reef**

- |                   |       |                           |
|-------------------|-------|---------------------------|
| (a) Barrier reef  | (i)   | Attached to coast         |
| (b) Fringing reef | (ii)  | Separated from the coast  |
| (c) Atoll         | (iii) | Encloses a central lagoon |

- (A) (a)–(ii)        (b)–(i)        (c)–(iii)
- (B) (a)–(iii)        (b)–(i)        (c)–(ii)
- (C) (a)–(i)        (b)–(ii)        (c)–(iii)
- (D) (a)–(i)        (b)–(iii)        (c)–(ii)

15. Which one of the following is a landform created by wave erosion (as opposed to deposition) ?

- (A) Spit
- (B) Sea arch
- (C) Tombolo
- (D) Estuary

16. The presence of which one of the following would indicate sea level fall or uplift of land :
- (A) An estuary
  - (B) An elevated marine terrace
  - (C) A tombolo
  - (D) Coastal dune
17. A middle-latitude cell in the 3-cell model of the general circulation :
- (A) Hadley Cell
  - (B) Polar Cell
  - (C) Storm Cell
  - (D) Ferrel Cell
18. The average earth surface temperature :
- (A)  $28^{\circ}\text{C}$
  - (B)  $32^{\circ}\text{C}$
  - (C)  $15^{\circ}\text{C}$
  - (D)  $5^{\circ}\text{C}$
19. The height (above mean sea level) corresponding to the atmospheric pressure 500 hPa will be close to :
- (A) 1.5 km
  - (B) 18 km
  - (C) 5.5 km
  - (D) 10.2 km
20. The pressure gradient force acts from :
- (A) High pressure region to low pressure region
  - (B) Low pressure region to high pressure region
  - (C) Higher latitudes to lower latitudes
  - (D) West to East
21. Among the following substances, which is commonly used for cloud seeding :
- (A) Silver Iodide
  - (B) Sand
  - (C) Black carbon
  - (D) Copper sulphate

22. This process pertains to heating or cooling in gases due strictly to their expansion and contraction :
- (A) Advection  
(B) Deflation  
(C) Adiabatic  
(D) Sublimation
23. The largest scale of atmospheric motion is :
- (A) Mesoscale  
(B) Local scale  
(C) Planetary scale  
(D) Urban scale
24. In seismology, the moment magnitudes are calculated by :
- (A) Slip amount  $\times$  Modulus of Elasticity  
(B) Shear Modulus  $\times$  (P-S Wave Velocity)  
(C) Slip  $\times$  Area  $\times$  Elastic Modulus  
(D) (P-S arrival)  $\times$  Amplitude
25. Which of the following group displays highest lateral extent in Cuddapah Basin ?
- (A) Nallamalai  
(B) Kistna  
(C) Cheyair  
(D) Papaghani
26. The Siwalik sequence represents the fluvial deposition of the Himalayan foreland basin while the marine sequence is marked by :
- (A) Subathu Formation  
(B) Murree Formation  
(C) Kasauli Group  
(D) Pinjor Formation
27. Stratigraphic position of Lameta Beds is :
- (A) Inter trappeans  
(B) Infratrappean  
(C) Epitrapean  
(D) Post-trapean

28. The Mesoproterozoic rift-valleys, Mahandi and Pranhita-Godavari are equated with Lambert rift of Antarctica and Unita rift of North America is supposed to be indicative of :
- (A) Fragmentation of Columbia  
(B) Fragmentation of Pannotia  
(C) Fragmentation of East and West Gondwana  
(D) Collision of East & West Gondwana
29. The high grade metamorphic rocks are brought over the low grade metamorphic rocks of Lesser Himalaya by a major thrust called :
- (A) Main Boundary Thrust  
(B) Lesser Himalayan Thrust  
(C) Indus Suture Zone  
(D) Main Central Thrust
30. The Krol-Tal boundary in the Lesser Himalaya represents :
- (A) Neoproterozoic - Cambrian transition  
(B) Cambro - Ordovician boundary  
(C) Cretaceous - Tertiary boundary  
(D) Jurassic - Cretaceous boundary
31. What is the age of most of sandstone reservoir rock in the Cambay Basin ?
- (A) Oligocene  
(B) Eocene  
(C) Miocene  
(D) Palaeocene
32. Petroleum is formed from oceanic organisms that have large component of .....and therefore less oxygen per carbon than the  $C_6H_{10}O_5$  of carbohydrates found as three major component of land plants :
- (A) pepofine  
(B) lipid  
(C) fulvic acids  
(D) amino acids
33. Construction of dams, levees and other channel improvement structures used for flood control are categorized as :
- (A) Non-structural approach  
(B) Structural approach  
(C) Curvilinear approach  
(D) Staggened approach

34. It is customary to describe common pyroxenes in terms of four end members : diopside, hedenbergite, enstatite, .....
- (A) ferrosilite  
(B) ferropericlase  
(C) faylite  
(D) jadite
35. The core mantle boundary occur at the depths of :
- (A) 3900 km  
(B) 5500 km  
(C) 2900 km  
(D) 1200 km
36. The ionospheric magnetic field is because of :
- (A) Hydrogen ions fusion  
(B) He bombardment on Na  
(C) Solar winds  
(D) Fluctuation in Geomagnetic fields
37. The average rock density of continental crust and the oceanic crust respectively are :
- (A)  $3.7 \text{ gm/cm}^3$  and  $2.7 \text{ gm/cm}^3$   
(B)  $8 \text{ gm/cm}^3$  and  $12 \text{ gm/cm}^3$   
(C)  $2.7 \text{ gm/cm}^3$  and  $3 \text{ gm/cm}^3$   
(D)  $2.7 \text{ gm/m}^3$  and  $3.5 \text{ gm/m}^3$
38. The surface waves for which the motion occurs in the direction of propagation and perpendicular in phased pattern are called :
- (A) L-wave  
(B) Rayleigh wave  
(C) P-wave  
(D) S-wave
39. Richter scale gives an idea of the amount of energy released during an earthquake and is based on the.....of seismic waves at a distance of.....km from the epicenter :
- (A) Amplitude and 100 km  
(B) Motion and 200 km  
(C) Epicenter and 300 km  
(D) Velocity and 400 km

40. The lower mantle is considered by most to be made up of three phases, Mg-pervoskite, Ca-pervoskite and .....  
(A) Ringwoodite  
(B) Ferropericlare  
(C) Mg-wusfite  
(D) Maforite
41. Seismicity is at very high frequency at which of the following compound to the others :  
(A) MORB  
(B) Extensional plate contacts  
(C) Subduction zones  
(D) Volcanoes
42. The difference in arrival times of P and S wave increases with distance while the ratio of P and S wave velocities :  
(A) Remains same  
(B) Decreases logarythmically  
(C) Decreases linearly  
(D) Increases periodically
43. The water discharged through streams consisting wholly or in part of water contributed by overland flow and groundwater flow is called :  
(A) Precipitation  
(B) Runoff  
(C) Transpiration  
(D) Evaporation
44. Which of the following is *not* part of a hydrologic cycle ?  
(A) Water infiltrating into the soil and bed rock  
(B) Water evaporating from a lake  
(C) Calcium carbonate dissolving in soil water and ground water  
(D) Water moving into crecks and streams following a rain

45. A saturated but relatively permeable material that *does not* yield appreciable quantities of water of wells is :
- (A) Aquiclude  
(B) Aquifuge  
(C) Aquitard  
(D) Aquifer
46. An aquifer bound by one or two aquitards is called as :
- (A) Artesian aquifer  
(B) Leaky aquifer  
(C) Unconfined aquifer  
(D) Perched aquifer
47. A layer of water bearing pervious material that is sandwiched between two clay layers is called :
- (A) Unconfined aquifer  
(B) Confined aquifer  
(C) Semi-unconfined aquifer  
(D) Semi-confined aquifer
48. The rock formation that can hold, transmit and yield water is called :
- (A) Aquiclude  
(B) Aquitard  
(C) Aquifuge  
(D) Aquifer
49. The single largest bedded type barite deposit located in Andhra Pradesh is :
- (A) Guntur  
(B) Hyderabad  
(C) Mangampetta  
(D) Nellore
50. Kimberlite and lamproite pipes are explored for :
- (A) Diamond  
(B) Beryl  
(C) Corundum  
(D) Quartz

**JAN - 35218/II—A**

**ROUGH WORK**