

# Science

Set No. : 1

Question Booklet No.

**RET/17/TEST-B**

**891**

**Geophysics**

*(To be filled up by the candidate by blue/black ball point pen)*

Roll No.

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Roll No. (Write the digits in words) .....

Serial No. of OMR Answer Sheet .....

Day and Date .....

( Signature of Invigilator )

## INSTRUCTIONS TO CANDIDATES

*(Use only blue/black ball-point pen in the space above and on both sides of the Answer Sheet)*

1. Within 30 minutes of the issue of the Question Booklet, Please ensure that you have got the correct booklet and it contains all the pages in correct sequence and no page/question is missing. In case of faulty Question Booklet. Bring it to the notice of the Superintendent/Invigilators immediately to obtain a fresh Question Booklet.
2. Do not bring any loose paper, written or blank, inside the Examination Hall *except the Admit Card without its envelope.*
3. *A separate Answer Sheet is given. It should not be folded or mutilated. A second Answer Sheet shall not be provided.*
4. Write your Roll Number and Serial Number of the Answer Sheet by pen in the space provided above.
5. *On the front page of the Answer Sheet, write by pen your Roll Number in the space provided at the top, and by darkening the circles at the bottom. Also, wherever applicable, write the Question Booklet Number and the Set Number in appropriate places.*
6. *No overwriting is allowed in the entries of Roll No., Question Booklet No. and Set No. (if any) on OMR sheet and Roll No. and OMR sheet no. on the Question Booklet.*
7. *Any change in the aforesaid entries is to be verified by the invigilator, otherwise it will be taken as unfair means.*
8. *This Booklet contains 40 multiple choice questions followed by 10 short answer questions. For each MCQ, you are to record the correct option on the Answer Sheet by darkening the appropriate circle in the corresponding row of the Answer Sheet, by pen as mentioned in the guidelines given on the first page of the Answer Sheet. For answering any five short Answer Questions use five Blank pages attached at the end of this Question Booklet.*
9. For each question, darken only **one** circle on the Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.
10. *Note that the answer once filled in ink cannot be changed. If you do not wish to attempt a question, leave all the circles in the corresponding row blank (such question will be awarded zero marks).*
11. For rough work, use the inner back pages of the title cover and the blank page at the end of this Booklet.
12. *Deposit both OMR Answer Sheet and Question Booklet at the end of the Test.*
13. You are not permitted to leave the Examination Hall until the end of the Test.
14. If a candidate attempts to use any form of unfair means, he/she shall be liable to such punishment as the University may determine and impose on him/her.

Total No. of Printed Pages : 20

**ROUGH WORK**

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## Research Entrance Test-2017

No. of Questions : 50

प्रश्नों की संख्या : 50

Time : 2 Hours

Full Marks : 200

समय : 2 घण्टे

पूर्णाङ्क : 200

**Note: (1)** This Question Booklet contains **40** Multiple Choice Questions followed by **10** Short Answer Questions.

इस प्रश्न पुस्तिका में **40** वस्तुनिष्ठ व **10** लघु उत्तरीय प्रश्न हैं।

**(2)** Attempt as many MCQs as you can. Each MCQ carries **3 (Three)** marks. **1 (One)** mark will be deducted for each incorrect answer. **Zero** mark will be awarded for each unattempted question. If more than one alternative answers of MCQs seem to be approximate to the correct answer, choose the closest one.

अधिकाधिक वस्तुनिष्ठ प्रश्नों को हल करने का प्रयत्न करें। प्रत्येक वस्तुनिष्ठ प्रश्न **3 (तीन)** अंकों का है। प्रत्येक गलत उत्तर के लिए **1 (एक)** अंक काटा जायेगा। प्रत्येक अनुत्तरित प्रश्न का प्राप्तांक शून्य होगा। यदि वस्तुनिष्ठ प्रश्नों के एकाधिक वैकल्पिक उत्तर सही उत्तर के निकट प्रतीत हों, तो निकटतम सही उत्तर दें।

**(3)** Answer only **5** Short Answer Questions. Each question carries **16 (Sixteen)** marks and should be answered in **150-200** words. Blank **5 (Five)** pages attached with this booklet shall only be used for the purpose. Answer each question on separate page, after writing Question No.

केवल **5 (पाँच)** लघुउत्तरीय प्रश्नों के उत्तर दें। प्रत्येक प्रश्न **16 (सोलह)** अंकों का है तथा उनका उत्तर **150-200** शब्दों के बीच होना चाहिए। इसके लिए इस पुस्तिका में लगे हुए सादे **5 (पाँच)** पृष्ठों का ही उपयोग आवश्यक है। प्रत्येक प्रश्न का उत्तर एक नए पृष्ठ से, प्रश्न संख्या लिखकर शुरू करें।

1. Booklungs are found in :

- |              |                  |
|--------------|------------------|
| (1) Amoeba   | (2) Polystomella |
| (3) Euglypha | (4) Arachnids    |

2. Silk is obtained from :

- |                |                       |
|----------------|-----------------------|
| (1) Adult moth | (2) Caterpillar stage |
| (3) Egg        | (4) Cocoon            |

3. Neurogenic heart is found in :

- |                  |                   |
|------------------|-------------------|
| (1) Human beings | (2) Rat           |
| (3) Rabbit       | (4) Invertebrates |

4. Epiphysis is also known as :

- |             |                  |
|-------------|------------------|
| (1) Pineal  | (2) Pituitary    |
| (3) Thyroid | (4) Hypothalamus |

5. Simplest and smallest form of amino acid is :

- |             |              |
|-------------|--------------|
| (1) Glycine | (2) Proline  |
| (3) Lysine  | (4) Argenine |

6. PCOS is related to :

- |            |             |
|------------|-------------|
| (1) Ovary  | (2) Uterus  |
| (3) Testes | (4) Oviduct |

7. Seminogelin is secreted by :

- |                  |                     |
|------------------|---------------------|
| (1) Epididymis   | (2) Seminal Vesicle |
| (3) Thecal cells | (4) Oviduct         |

8. First cleavage in frog is :

- |                |                 |
|----------------|-----------------|
| (1) Horizontal | (2) Meridional  |
| (3) Equatorial | (4) Latitudinal |

9. Which of the following is nuclear receptor ?

- |        |          |
|--------|----------|
| (1) AR | (2) GPCR |
| (3) IR | (4) MT1  |

10. Cryptorchidism is related to :

- |            |              |
|------------|--------------|
| (1) Testes | (2) Thyroid  |
| (3) Ovary  | (4) Pancreas |

11. Which of the following is NOT an element of weather and climate ?

- |                 |              |
|-----------------|--------------|
| (1) altitude    | (2) humidity |
| (3) temperature | (4) pressure |

12. What general circulation wind belt is the place of origin for hurricanes ?

- |                 |                     |
|-----------------|---------------------|
| (1) westerlies  | (2) doldrums        |
| (3) trade winds | (4) horse latitudes |



18. In Cartesian coordinate system, if the geological strike of a two-dimensional body is oriented along the x-direction, then the electromagnetic field components associated with TM mode of magnetotelluric method are :

- |                          |                          |
|--------------------------|--------------------------|
| (1) $H_x, H_y$ and $E_z$ | (2) $E_x, H_y$ and $E_z$ |
| (3) $H_x, E_y$ and $E_z$ | (4) $E_x, H_y$ and $H_z$ |

19. Gravity field is maximum at poles because :

- (1) Polar ice caps,
- (2) High density,
- (3) Excess mass,
- (4) Flattening of earth and earth's centrifugal force

20. Electromagnetic Surveys give better results :

- (1) If the top surface layer is more conductive,
- (2) If the top surface layer is less conductive,
- (3) If the top surface layer is highly magnetic,
- (4) Not depend on the conductivity of surface layer

21. In a 4-layer subsurface model, which combination of A-, H-, k- and Q-type electrical resistivity sounding curves is NOT possible ?

- |        |        |
|--------|--------|
| (1) HA | (2) HQ |
| (3) KQ | (4) AK |





27. Which of the following log is used for depth matching and well to well correlation while running with other logs ?
- (1) Natural Gamma Log                      (2) Gamma Gamma log  
(3) Neutron log                                (4) SP log
28. Free fluid index (FFI) of a formation is estimated from :
- (1) Neutron Log                                (2) Resistivity Log  
(3) SP log,                                      (4) NMR log
29. Seismic inversion without geological model gives :
- (1) Absolute impedance,  
(2) Relative impedance,  
(3) Both Absolute and relative impedance,  
(4) Lithology
30. The focal mechanism solution of an earthquake depicts quadrants of :
- (1) Compression                                (2) Dilatation  
(3) Compression & dilation                (4) Seismic moment
31. The surface wave magnitude of an earthquake is a function of the amplitude of :
- (1) P waves                                      (2) S waves  
(3) Rayleigh waves                            (4) Love waves

32. .... refers to the horizontal of air while..... is the vertical transport of air.
- (1) Advection, convection                      (2) Convection, Advection  
(3) Advection, Advection                      (4) Convection, Convection
33. Which of the following air masses is the densest ?
- (1) Cold and moist                              (2) Cold and dry  
(3) Warm and moist                              (4) Warm and dry
34. A wind from 300 degrees is a \_\_\_\_ wind.
- (1) Northeast                                      (2) Northwest  
(3) Southwest                                      (4) Southeast
35. The term stratus means :
- (1) Vertically developed                      (2) Upper level  
(3) Horizontally layered                      (4) Low level
36. The best moisture parameter to assess the amount of moisture in the air from the choices below is :
- (1) Relative humidity                      (2) Temperature  
(3) CAPE    (4) Dew point
37. The dry adiabatic lapse rate is equal to :
- (1)  $9.8^{\circ}\text{C}/\text{km}$                                       (2)  $6.5^{\circ}\text{C}/\text{km}$   
(3)  $5.5^{\circ}\text{C}/\text{km}$                                       (4)  $1.5^{\circ}\text{C}/\text{km}$

38. A balance between the Coriolis and Pressure Gradient Force is termed the.....wind. This balance occurs most significantly aloft in the middle latitudes with a straight flowing wind.
- (1) Gradient (2) Cyclostrophic  
(3) Geostrophic (4) Ageostrophic
39. A hurricane is a (n) :
- (1) Cold core low (2) Warm core low  
(3) Thermal low (4) Anticyclonic system
40. Why is the ITCZ mean position North of the Equator ?
- (1) There is ore oceanarea in the Northern Hemisphere  
(2) The Coriolis force is stronger in the Northern Hemisphere  
(3) There tends to be lower pressure due to more landmass near the Northern Hemisphere equatorial region  
(4) The magnetic pole is in the Northern Hemisphere

### **Short Answer Questions**

**Note:** Attempt any **five** questions. Write answer in **150-200** words. Each question carries **16** marks. Answer each question on separate page, after writing Question Number.

01. Name the various configurations used in geoelectrical measurements. Find out the geometrical factor of any one of these configuration.
02. What do you understand by diurnal and normal corrections in geomagnetic data ?
03. Describe the various velocities used in seismic prospecting. Which one is used for stacking of data with its explanations ?
04. Describe the origin of MT field below and above 1Hz, and write the Cagniard expression of apparent resistivity in MT field.
05. Discuss the relation between gravity and magnetic potentials and its use in interpretation of potential field.
06. Discuss the different types of wind systems.
07. What is break in Monsoon ? Discuss its cause & impact over the Indian region ?
08. Explain the principles of weather forecasting ?
09. Discuss the origin & life cycle of tropical cyclone.
10. Discuss the vertical temperature distribution of atmosphere. Why temperature increases in stratosphere ?

Question No.

Page for Short Answer

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Question No.

Page for Short Answer

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Question No.

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Question No.

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## अभ्यर्थियों के लिए निर्देश

(इस पुस्तिका के प्रथम आवरण पृष्ठ पर तथा उत्तर-पत्र के दोनों पृष्ठों पर केवल नीली-काली बाल-प्वाइंट पेन से ही लिखें)

1. प्रश्न पुस्तिका मिलने के 30 मिनट के अन्दर ही देख लें कि प्रश्नपत्र में सभी पृष्ठ मौजूद हैं और कोई प्रश्न छूटा नहीं है। पुस्तिका दोषयुक्त पाये जाने पर इसकी सूचना तत्काल कक्ष-निरीक्षक को देकर सम्पूर्ण प्रश्नपत्र की दूसरी पुस्तिका प्राप्त कर लें।
2. परीक्षा भवन में लिफाफा रहित प्रवेश-पत्र के अतिरिक्त, लिखा या सादा कोई भी खुला कागज साथ में न लायें।
3. उत्तर-पत्र अलग से दिया गया है। इसे न तो मोड़ें और न ही विकृत करें। दूसरा उत्तर-पत्र नहीं दिया जायेगा। केवल उत्तर-पत्र का ही मूल्यांकन किया जायेगा।
4. अपना अनुक्रमांक तथा उत्तर-पत्र का क्रमांक प्रथम आवरण-पृष्ठ पर पेन से निर्धारित स्थान पर लिखें।
5. उत्तर-पत्र के प्रथम पृष्ठ पर पेन से अपना अनुक्रमांक निर्धारित स्थान पर लिखें तथा नीचे दिये वृत्तों को गाढ़ा कर दें। जहाँ-जहाँ आवश्यक हो वहाँ प्रश्न-पुस्तिका का क्रमांक तथा सेट का नम्बर उचित स्थानों पर लिखें।
6. ओ० एम० आर० पत्र पर अनुक्रमांक संख्या, प्रश्नपुस्तिका संख्या व सेट संख्या (यदि कोई हो) तथा प्रश्नपुस्तिका पर अनुक्रमांक और ओ० एम० आर० पत्र संख्या की प्रविष्टियों में उपरिलेखन की अनुमति नहीं है।
7. उपर्युक्त प्रविष्टियों में कोई भी परिवर्तन कक्ष निरीक्षक द्वारा प्रमाणित होना चाहिये अन्यथा यह एक अनुचित साधन का प्रयोग माना जायेगा।
8. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार वैकल्पिक उत्तर दिये गये हैं। प्रत्येक प्रश्न के वैकल्पिक उत्तर के लिए आपको उत्तर-पत्र की सम्बन्धित पंक्ति के सामने दिये गये वृत्त को उत्तर-पत्र के प्रथम पृष्ठ पर दिये गये निर्देशों के अनुसार पेन से गाढ़ा करना है।
9. प्रत्येक प्रश्न के उत्तर के लिए केवल एक ही वृत्त को गाढ़ा करें। एक से अधिक वृत्तों को गाढ़ा करने पर अथवा एक वृत्त को अपूर्ण भरने पर वह उत्तर गलत माना जायेगा।
10. ध्यान दें कि एक बार स्याही द्वारा अंकित उत्तर बदला नहीं जा सकता है। यदि आप किसी प्रश्न का उत्तर नहीं देना चाहते हैं, तो संबंधित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें। ऐसे प्रश्नों पर शून्य अंक दिये जायेंगे।
11. रफ कार्य के लिए प्रश्न-पुस्तिका के मुखपृष्ठ के अंदर वाला पृष्ठ तथा उत्तर-पुस्तिका के अंतिम पृष्ठ का प्रयोग करें।
12. परीक्षा के उपरान्त केवल ओ एम आर उत्तर-पत्र परीक्षा भवन में जमा कर दें।
13. परीक्षा समाप्त होने से पहले परीक्षा भवन से बाहर जाने की अनुमति नहीं होगी।
14. यदि कोई अभ्यर्थी परीक्षा में अनुचित साधनों का प्रयोग करता है, तो वह विश्वविद्यालय द्वारा निर्धारित दंड का/की, भागी होगा/होगी।