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

Roll No.

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 10 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 changes 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 page 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 : 15

FOR ROUGH WORK

Research Entrance Test – 2015

No. of Questions : 50

Time : 2 Hours   *Full Marks : 200*

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

(ii) 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.

(iii) **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.

1. Neoprene is polymer of :
   (1) Orlon   (2) SAN   (3) ABS   (4) All of these

2. The reagent that can be used to distinguish between Glucose and Fructose is :
   (1) Bromine water   (2) Fehling's solution
   (3) Tollen's reagent   (4) Phenyl hydrazine

3. What will happen if a lysosome leaks inside the cell ?
   (1) The lysosomal enzymes will digest cell organelles
   (2) The lysosomal enzymes will become nonfunctional at pH 7.4 of the cytoplasm
   (3) The lysosomal enzymes will be secreted out of the cell
   (4) The leaked suicidal bag will make cell to commit suicide

4. Oxygen evolved during photosynthesis in plants comes from :
   (1) Splitting of water molecules
   (2) Breakdown of carbon dioxide
   (3) Carbohydrates accumulated by plants
   (4) Lipids

5. The contribution of Gregor Johann Mendel is related to the area of :
   (1) Plant classification   (2) Genetics
   (3) Cell structure   (4) Plant functions

6. Himalaya is :
   (1) Paleozoic tectonic mountain   (2) Recent Folded mountain
   (3) Indian mountain   (4) Eurasian mountain

7. A particle executes simple harmonic motion under the restoring force provided by a spring. The time period is T. If the spring is dived in two equal parts and one part is used to continue the simple harmonic motion, the time period will :
   (1) remain T   (2) become 2T   (3) become T/2   (4) become $T/\sqrt{2}$

8. The efficiency of the Carnot's engine working between the steam point and the ice point is :
   (1) 36.81%   (2) 26.81%   (3) 40%   (4) 16.8%

(2)

9. If $\vec{a} = 2i - 3j + 4k$ and $\vec{b} = 3i + 2j$, then the angle between $\vec{a}$ and $\vec{b}$ is :

(1) 45° (2) 90° (3) 180° (4) 120°

10. The value of the integral $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx$ is

(1) π (2) $\frac{\pi}{2}$ (3) $\frac{\pi}{4}$ (4) $-\frac{\pi}{4}$

11. Post mortem history of the organisms is studied in which of the following sub branches of palaeontology ?

(1) Palaeoecology (2) Biostratigraphy
(3) Ichnology (4) Taphonomy

12. Endoxyl is

(1) Boring in rocks (2) Boring in woods
(3) Burrowing in soft sediments (4) Burrowing in firm sediments

13. Select an organic walled microfossil from the following :

(1) Foraminifers (2) Conodonts
(3) Pollen and spores (4) Ostrcodes

14. The Permian/Triassic boundary lies at about :

(1) 250 Ma (2) 245 Ma (3) 235 Ma (4) 225 Ma

15. How many major extinction events occurred in the geological past ?

(1) 8 (2) 7 (3) 6 (4) 4

16. Ediacara is the uppermost part of which of the following eras ?

(1) Proterozoic (2) Archean (3) Palaeozoic (4) Mesozoic

17. The "Ring of Fire" -an arcuate belt with the largest number of active volcanoes on earth is found in :

(1) Atlantic ocean (2) Pacific ocean
(3) African rift valley (4) Mid oceanic ridges

18. Lithosphere comprises of :

(1) Crust and Mantle (2) Crust, Mantle and Outer core
(3) Crust and Upper mantle (4) Crust and Lower mantle

19. 90°E ridge is located in :
    (1) Antarctic Ocean   (2) Arabian Sea
    (3) Indian Ocean   (4) None of the above

20. In a limited area when younger rock is surrounded by older rock, then the structure is called as :
    (1) Klippe   (2) Window   (3) Inlier   (4) Outlier

21. The amount of dip measured along the strike direction of a vertical bed is :
    (1) 45°   (2) 60°   (3) 90°   (4) Zero

22. The fold in which the axes plunges directly down the dip of the axial surface is termed as :
    (1) Normal folds   (2) Reclined fold
    (3) Cascade fold   (4) Drag fold

23. Vitric fragments occur :
    (1) Pyroclastic rocks   (2) Oil shale
    (3) Packstone   (4) Grainstone

24. Oncolites are :
    (1) Spheroidal Stratomatolites (2) A type of Micrite
    (3) A type of Ooides   (4) A type of Pelloids

25. Calcite in limestones could be :
    (1) High or low selenium   (2) High *or low* cadmium
    (3) High or low Magnesium   (4) High or low Sodium

26. Sutured contact of constituent grains is characteristics of :
    (1) Quartz wacke   (2) Lithic wacke
    (3) Quartz arenite   (4) Arkose

27. High content of vitrinite in coals is suggestive of :
    (1) Eutrophic conditions
    (2) Oligotrophic conditions
    (3) Larger participation of sub-aquatic plants
    (4) larger participation of reed plants

28. The Permian coals of India, in general, are :
    (1) High in ash content
    (2) High in sulphur content
    (3) Low in volatile content
    (4) Very low in inertinite content

29. The system diopside-anorthite is an example of :
    (1) Syenite system
    (2) Granite system
    (3) Basalt system
    (4) Peridotite system

30. Micrographic intergrowth of quartz and alkali feldspar is known as :
    (1) Myrmekite texture
    (2) Granophyre texture
    (3) Variolitic texture
    (4) Symplectite texture

31. Composition of alkali feldspar granite is:
    (1) Quartz, plagioclase feldspar and alkali feldspar
    (2) Quartz and plagioclase feldspar only
    (3) Only alkali feldspar
    (4) Quartz and alkali feldspar only

32. What is K-electron capture ?
    (1) The nucleus capture an proton
    (2) The nucleus capture an orbital electron and converted a proton into a neutron with emission of neutrino.
    (3) The nucleus capture an orbital electron and converted a proton into a neutron without emission of neutrino.
    (4) The nucleus captures an orbital electron and converted a neutron into a proton.

33. What is an isochron diagram ?
    (1) An isochron diagram is a bivariate plot of measured daughter-parent isotope ratios for a suite of cogenetic samples.
    (2) An isochron diagram is a bivariate plot of measured parent-daughter isotope ratios for samples of different origin.
    (3) An isochron diagram is a trivariate plot of measured parent-daughter isotope ratios for a suite of cogenetic samples.
    (4) An isochron diagram is a bivariate plot of measured parent-daughter isotope ratios for a suite of cogenetic samples.

34. Which of the following is not a mantle reservoir ?
(1) Depleted mantle
(2) HIMU mantle
(3) Enriched mantle
(4) Continental crust

35. Which facies is known to occupy the maximum outcrop width during metamorphism of low pressure :
(1) Albite-epidote hornfels facies
(2) Hornblende hornfels facies
(3) Pyroxene hornfels facies
(4) Sanidinite facies

36. The temperature of melting during the formation of migmatites depends on:
(1) Anorthite content of the rock
(2) H_2O pressure
(3) Fe content of the rock
(4) Anorthite content and H_2O pressure

37. Which of the following is not a charnockite forming reaction :
(1) Qtz + Kfs + Bio = Opx + L
(2) Qtz + Bio = Opx + L
(3) Qtz + Bio = Kfs + Opx + L
(4) Musc + Qtz = Kfs + Sill + L

38. In a False Colour Composite :
(1) Parts of non-visible electromagnetic spectrum are expressed as one or more of the red, green and blue components, so that the colours produced by the earth's surface do not correspond to normal visual experience
(2) Parts of the visible electromagnetic spectrum are expressed as one or more of the red, green or blue components
(3) Parts of non-visible electromagnetic spectrum are expressed as one or more of the red, green and blue components, so that the colours produced by the earth's surface correspond to normal visual experience
(4) Parts of non-visible electromagnetic spectrum are expressed as all the red, green and blue components, so that the colours produced by the earth's surface correspond to normal visual experience

39. Economic mineral deposits of sillimanite are formed by :
(1) Hydrothermal processes
(2) Supergene enrichment
(3) Metamorphic processes
(4) Magmatic processes

40. Graphite feels slippery when rubbed between fingers due to :
(1) Sheets of carbon atoms
(2) Natural smoothness of the mineral
(3) Breaking of Van der Waals bonds
(4) Honeycomb lattice of graphite

(6)

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.

1. Discuss the different types of taphonomic processes.

2. Discuss the Lower Vindhyan stratigraphy of Son Valley.

3. Discuss how plate tectonics is a unifying theory that explains diverse phenomenon like deformation, volcanism, formation of granites, metamorphism, aulacogens and earthquakes.

4. What is an unconformity ? Give the geological significance of unconformity ? What are the criteria for distinguishing a fault and an unconformity ?

5. Discuss, in brief, the process of authigenesis in clastic sedimentary rocks.

6. What changes are brought to the plant litter in a peat swamp up to a depth of 10 (Ten) meters.

7. Discuss the IUGS classification schemes for plutonic igneous rocks.

8. Explain, in brief, how trace elements are useful in interpreting petrogenesis of rocks ?

9. Define isograds and reaction isograds. Discuss using neat sketches which of the two is more precise and why ?

10. Discuss the applications of Remote Sensing to mineral exploration and hydrogeology.

Roll No. : ....

Q. No. :

Q. No. :

RET/15/Test B/883

FOR ROUGH WORK