Set No. : 1

RET/16/TEST-B

Question Booklet No.

750 | Soil Sc. & Agricultural Chem.

(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 fesh 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 : 16

11. Ag.

ROUGH WORK
रफ़ कार्य

Research Entrance Test-2016

No. of Questions : 50

Time : 2 Hours ***Full Marks : 200***

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

(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.

(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.

01. Where is the International Rice Research Institute located ?

(1) Manila (2) Chicago

(3) Cairo (4) Cuttack

02. Trypsin is basically what ?

(1) Fatty acid (2) Sugar

(3) Oligo-nucleotide (4) Protein

03. GMO stands for what ?

(1) Genetically Modified Organisms

(2) Genetically Multipied Organisms

(3) Green Modified Organisms

(4) Green Modified Orange

04. Which international treaty was documented in 1987 and implemented in 1989, to avoid deleterious effects of ultra- violet radiation owing to ozone layer depletion ?

(1) Cartagene protocal
(2) Montreal protocol
(3) Geneva protocol
(4) Antartica Environmental protocol

05. The tissue bearing dead cells is ?

(1) Collenchyma (2) Parenchyma
(3) *Xylem* (4) Phellogen

06. Sub-cellular components are separated by means of ?

(1) Chromatography
(2) Autoradiography
(3) Electrophoresis
(4) Differential and density gradient centrifugation

07. Which these is a vertebrate animal ?

(1) Prawn (2) Snake
(3) Mosquito (4) Octopus

08. Which of these is not a C_4 plant ?

(1) Maize (2) Rice
(3) Sorghum (4) Sugarcane

09. Cell theory was first formulated by ?

(1) Schleiden and Schwann (2) Rudolf Vrichow
(3) A.V. Leeuwenhock (4) Ruth Sagar

10. Apple is a ?

(1) True fruit (2) False fruit
(3) Vegetable (4) Parthenocarpic fruit

11. Which of the following soil orders is not found in India ?
(1) Mollisols (2) Vertisols
(3) Oxisols (4) Inceptisols

12. Soil forming process likely to operate under hydromorphic condition is :
(1) Laterization (2) Gleization
(3) Salinization (4) Podzolization

13. EB-horizon is a :
(1) Combination horizon (2) Transitional horizon
(3) Master horizon (4) Burried horizon

14. Clay minerals are mostly shaped like :
(1) Sphere (2) Come
(3) Plate (4) Cube

15. The ratio of volume of water to volume of solid is known as :
(1) Volume wetness (2) Degree of saturation
(3) Mass wetness (4) Void ratio

16. Tensiometer practically measures soil suction below :
(1) 0.40 bar (2) 0.80 bar
(3) 0.60 bar (4) 0.90 bar

17. The 'Critical limit' approach is generally more suited to :
(1) Secondary nutrients (2) Primary nutrients
(3) Micronutrients (4) Labile nutrients

18. The most common extractant used to extract available Mo in soil is :
(1) Ammonium oxalate at pH 3.3
(2) Ammonium oxalate at pH 4.3
(3) Ammonium oxalate at pH 5.3
(4) Ammonium oxalate at pH 6.3

19. Fertility gradient approach was given by :
(1) Filts (2) Colwell
(3) Ramamoorthy (4) Bray

20. 'Crop logging' is a term related to :
(1) Assessing flood hit areas
(2) Assessing suitability of fertilizers
(3) Assessing nutrient need of a crop from leaf analysis
(4) Assessing pest damage

21. The mean soil organic C (SOC) content of a profile up to a depth of 1 m is 0.5 per cent. The mean bulk density of the soil is 1.5 g cm^{-3}. What is the SOC stock up to 1 m depth ?
(1) 7.5 kg m^{-2} (2) 7.5 g m^{-2}
(3) 15 g cm^{-2} (4) 7.5 kg cm^{-2}

22. Loss of applied N through volatilization occurs in :
(1) Neutral pH (2) Alkali pH
(3) Acidic pH (4) Extremely acidic pH

23. Akiochi disease of rice is caused due to :
(1) Fe (2) P (3) H_2S (4) Al

24. Phytic acid and phytin is rich in :
(1) Cu (2) N (3) Zn (4) P

25. Each unit change in pH represents a change in activity of H^+ or OH^- ion by :

(1) One-fold (2) Ten-fold

(3) Hundred-fold (4) Five-fold

26. CEC of which clay mineral is highest :

(1) Mica (2) Vermicullite

(3) Montmorillonite (4) Chlorite

27. Phosphate in soil moves mainly through :

(1) Mass flow (2) Diffusion

(3) Osmotic movement (4) Hydrodynamic dispersion

28. The metallic element most abundant in the earth's crust is :

(1) Mn (2) K (3) Fe (4) Al

29. Marble is a metamorphic rock that has originated from :

(1) Coal (2) Granite

(3) Dolomite (4) Shale

30. The width of the diffuse double layer does not depend on :

(1) Electronic charge (2) Temperature

(3) Concentration of electrolyte (4) Bulk density

31. Nitrogenase mediated reduction of di-nitrogen to ammonia involves :

(1) 2 electrons (2) 6 electrons

(3) 10 electrons (4) 14 electrons

32. *Nitrosomonas* functions actively in :
(1) Acidic medium (2) Basic medium
(3) Both Acidic & Basic medium (4) Neutral medium

33. Which of the following is non-obligatory beneficial microbial interaction?
(1) Protocooperation (2) Paractitism
(3) Commensalism (4) Amensalism

34. Stem and root nodulation in *Sesbania rostrata* is caused by :
(1) *Rhizobium* (2) *Azorhizobium*
(3) *Mesorhizobium* (4) *Azospririllum*

35. Which compound is not a component of root exudated 'mucigel' :
(1) Glucose (2) Sucrose
(3) Furctose (4) Aspartic acid

36. Hymatomelanic acid is a part of :
(1) Humin (2) Fulvic acid
(3) Humic acid (4) Grey humic acid

37. Rancidity is biochemical change of oil through the process of :
(1) Hydrolysis
(2) Oxidation
(3) Hydrogenation
(4) Both hydrolysis and oxidation

38. Insecticide Lindane in an isomer of :
(1) α- BHC (2) γ-BHC
(3) β-BHC (4) δ-BHC

39. Spectrometric technique based on atomic emission is used in :
(1) UV-VIS spectrophotometer
(2) IR spectrophotometer
(3) Flame photometer
(4) NMR spectrometer

40. Composition of Nessler's reagent is :
(1) $HgI + HgCl_2$
(2) $HgI + KI$
(3) $HgI + KI + KOH$
(4) $HgI + KI + NH_4OH$

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.

1. Describe the concept of soil as per Soil Survey Staff *(1999). How does* it differ from the concept of land?

2. Justify the statement "climate is the most influential factor of soil formation". Describe the role of CO_2 in calcification process.

3. State Stoke's Law and derive Stoke's equation. What are limitations of Stoke's Law ?

4. Describe in brief the consequences of excessive nutrient mining. What are its impact on crop productivity and soil quality ?

5. What happens when a water soluble phosphatic fertilizer is added to acidic soil? How can phosphorus use efficiency be increased?

6. What are sodic soils? How could they be reclaimed ?

7. How can we classify soil organic matter depending on the solubility in acid and alkali? Outline the theories of humus formation.

8. What is Braggs law? How will you identify a clay mineral using x-ray diffraction spectrometry ?

9. Distinguish between nitrification and nitrogen fixation and write microbiology of nitrification.

10. Discuss the techniques for minimization of green house gas emission from soil-plant system.

Question No. प्रश्न संख्या	Page for Short Answer लघु उत्तरीय के लिए पृष्ठ

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Question No. प्रश्न संख्या	Page for Short Answer लघु उत्तरीय के लिए पृष्ठ

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 10 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।