Question Booklet No. 10001

*(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 ....(Ag) 2017............................

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 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 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.

[उपर्युक्त निर्देश हिन्दी में अन्तिम आवरण-पृष्ठ पर दिये गये हैं।]

Total No. of Printed Pages : 16

12,

(Ag) 2017

Research Entrance Test – 2017

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. Which lime is referred to as quick lime ?

    (1) CaO

    (2) $Ca(OH)_2$

    (3) $CaMg(CO_3)_2$

    (4) $CaCO_3$

2. Ooze test is done to detect :

    (1) Bacterial disease

    (2) Fungal disease

    (3) Viral disease

    (4) All of these

3. For test of goodness of fit, which statistical test is applied ?

    (1) χ^2 test

    (2) 'F' test

    (3) 'Z' test

    (4) 't' test

4. Farm management is an :

    (1) Intra-farm science

    (2) Inter-farm science

    (3) Inter-regional farm science

    (4) International farm science

5. The term "Ever Green Revolution" was given by :

    (1) R. S. Paroda

    (2) V. L. Chopra

    (3) Norman Borloug

    (4) M. S. Swaminathan

6. "Operation flood" is related to :

    (1) Rice

    (2) Fish

    (3) Milk

    (4) Oilseeds

7. During prophase-I of meiosis crossing over occurs at :

    (1) Zygotene

    (2) Pachytene

    (3) Diplotene

    (4) Diakinesis

8. Larva of buttery is known as :

    (1) Grub

    (2) Nymph

    (3) Catterpiller

    (4) Maggot

9. Marginal product is ratio of :
   (1) Input-Output
   (2) Output-Input
   (3) Cost-Income
   (4) Price-Income

10. Mendel did not work on which of the following ?
    (1) Plant height in pea
    (2) Seed colour in pea
    (3) Pod number in pea
    (4) Pod size in pea

11. Direct runoff includes :
    (1) Surface runoff, prompt interflow and channel precipitation
    (2) Surface runoff, infiltration and evaporation
    (3) Overland flow only
    (4) Rainfall and evaporation

12. Instantaneous unit hydrograph is a hydrograph of :
    (1) Unit duration and infinitely small rainfall excess
    (2) Infinity small duration and of rainfall excess
    (3) Zero effective precipitation
    (4) Zero frequency

13. The flow-duration curve is a plot of :
    (1) Discharge against time in chronological order
    (2) Accumulated flow against time
    (3) The base flow against percentage of time the flow is exceeded
    (4) The stream discharge against the percentage of time the flow is equaled

14. For an annual flood series arranged in decreasing order of magnitude, the return period for a magnitude listed at position m in a total of N entries is :
    (1) m/N
    (2) $m/(N + 1)$
    (3) $(N + 1)/m$
    (4) $N/(m + 1)$

15. If the maximum depth of a 50 years 15h-rainfall depth at Varanasi is 250 mm, the 50 year-3 h maximum rainfall depth at the same place is :
    (1) < 250 mm
    (2) > 250 mm
    (3) = 250 mm
    (4) Inadequate data to conclude

16. Characteristics of the spatial data is called :
    (1) Information   (2) Data model   (3) Structure   (4) Attribute data

17. In .... model, terrain is sub-divided into number of parcel or sub-divided the space into grid cells or unit :
    (1) Raster   (2) Vector   (3) Structure   (4) Object

18. At stage III of gully development :
    (1) Erosion is very heavy   (2) Vegetation starts growing
    (3) Rill formation starts   (4) The gully is completely established

19. Which of the following channel has the highest hydraulic radius ?
    (1) Parabolic   (2) Flatter   (3) Trapezoidal   (4) Triangular

20. Piping is the removal of soil which is located :
    (1) Near the head wall   (2) Near the sill
    (3) Below the foundation   (4) Side of the structure

21. A watershed of 1500 ha is discharging through a drain at an average rate of 1.5 m^3/sec, the drainage coefficient is :
    (1) 8.64 mm   (2) 8.64 cm   (3) 4.32 mm   (4) 4.32 cm

22. 8 g of Sodium Chloride is dissolved in 2 litres of water, the salt concentration in ppm is :
    (1) 4000   (2) 8000   (3) 2000   (4) 16000

23. If the net amount of irrigation is 8 cm and field efficiency is 75%, the gross amount of water to be applied to the field will be :
    (1) 10.66 cm   (2) 8.75 cm   (3) 10.66 mm   (4) 8.75 mm

24. Evapotranspiration is directly measured by :
    (1) Penman - Monteith method   (2) Blaney - Criddle method
    (3) Penman Method   (4) Lysiemeter method

25. The gauge used to measure the depth of flow over a weir is located upstream of a weir at a distance of about :
    (1) Twice the approximate head   (2) Thrice the approximate head
    (3) Four times the approximate head   (4) Equal to approximate head

26. Sides of an earthen channel will be stable if its slope :

(1) Does not exceed the angle of repose (2) Exceeds the angle of repose

(3) Is kept same as angle of repose (4) None of the above

27. The drainable porosity of clay soil varies from :

(1) 10 – 15% by volume (2) 18 – 35% by volume

(3) 3 – 11% by volume (4) 15 – 20% by volume

28. The pump efficiency, motor efficiency and drive efficiency of a centrifugal pump set are 80%, 90% and 75%, respectively. The overall efficiency of the pump set is :

(1) 50% (2) 54%

(3) 75% (4) 90%

29. Irrigation frequency is a function of :

(1) Crop only (2) Soil only

(3) Crop and soil only (4) Crop, soil and climate

30. Application of irrigation depth depends on :

(1) Root zone depth (2) Soil moisture content

(3) Apparent specific gravity of soil (4) All of the above

31. Theoretically aquifer best suited for artificial recharge are those that have :

(1) High vertical hydraulic conductivity and low horizontal hydraulic conductivity

(2) High vertical hydraulic conductivity and high horizontal hydraulic conductivity

(3) Low vertical hydraulic conductivity and high horizontal hydraulic conductivity

(4) High vertical hydraulic conductivity and moderate horizontal hydraulic conductivity

32. Percolation tanks are suitable for recharging ground water in :
    (1) Both alluvial and hard rock formations
    (2) Hard rock formation
    (3) Deeper aquifers with highly permeable formations
    (4) Alluvial formation

33. The ratio of piezometric head to phreatic head of a semiconfined aquifer is :
    (1) Less than 1   (2) Equal to 1
    (3) More than 1   (4) Between 0.8 to 1

34. Porosity of an aquifer having bulk density 0.9 g/cm^3 and particle density 2.50 g/cm^3 is :
    (1) 36%   (2) 50%   (3) 64%   (4) 58%

35. If all Eigen values of Hessian matrix are positive then function is :
    (1) Strictly convex   (2) Convex   (3) Strictly concave   (4) Concave

36. A system in which a variable changes only at certain discrete intervals of time and holds a constant value between intervals is termed as :
    (1) Discrete system   (2) Lumped parameter system
    (3) Distributed parameter system   (4) Quantized system

37. The arrangement of terrain features which provides attributes: the shape, size & texture of object is called :
    (1) Temporal variation   (2) Spatial variation
    (3) Spectral variation   (4) None of these

38. The refractive index of ocean water :
    (1) Decreases with salinity   (2) Increases with salinity
    (3) Increases with temperature   (4) Does not change with temperature

39. Rayleigh's criteria for a rough surface is (where letters carry their usual meanings) :
    (1) $h > \lambda \cos\theta$ (2) $n = \lambda/8 \cos\theta$ (3) $h > \lambda/8 \cos\theta$ (4) $h < \lambda/8 \cos\theta$

40. In optimization of function the point at which the function will have a maximum or minimum values is termed as :
    (1) Saddle point   (2) Stationery point   (3) Local point   (4) Global point

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. Express the inter relationship between rate of soil movement by wind erosion, wind speed, average soil particle size and threshold velocity of wind.

2. What are remote sensing regions and bands ? Discuss on their significance in remote sensing.

3. Describe the various supervised classifier used to classify images.

4. Prove that most economical section of rectangular channel giving maximum discharge would be when depth is half of the breadth.

5. List the various initial water table profiles used in sub-surface drainage theory.

6. Define the different types of salt affected soils.

7. Describe the factors affecting design of farm irrigation system.

8. What is infiltration gallery and under what circumstance it is adopted ?

9. Define conjunctive use of water and write the benefits accuring from conjective use of water.

10. Explain the system approach and briefly describe how a system is analysed.

Roll No. : ....

Q. No. :

Roll No. : ....

Q. No. :

Roll No. : ....

Q. No. :

Q. No. :

FOR ROUGH WORK

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 कृपया 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।*

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, प्रश्न-पुस्तिका संख्या व सेट संख्या (यदि कोई हो) तथा प्रश्न-पुस्तिका पर अनुक्रमांक संख्या 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. इस पुस्तिका में 40 बहुविकल्पीय प्रश्नों के साथ 10 लघु उत्तरीय प्रश्न हैं। प्रत्येक बहुविकल्पीय प्रश्न के लिए, आपको उत्तर-पत्र के प्रथम पृष्ठ पर दी गयी गाइडलाइन के अनुसार सही विकल्प के लिए उत्तर-पत्र की संगत पंक्ति में उपयुक्त गोले को पेन द्वारा काला करना है। किन्हीं पाँच लघु उत्तरीय प्रश्नों के उत्तर देने के लिए प्रश्न-पुस्तिका के अन्त में संलग्न पाँच रिक्त पृष्ठों का प्रयोग कीजिए।

9. प्रत्येक प्रश्न के उत्तर के लिये केवल *एक* ही वृत्त को गाढ़ा करें। एक से अधिक वृत्तों को गाढ़ा करने पर अथवा एक वृत्त को आंशिक 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 सम्बन्धित पंक्ति के सामने दिये गये सभी वृत्तों को खाली छोड़ दें ऐसे (प्रश्नों पर शून्य अंक दिये जायेंगे।)*

11. रफ कार्य के लिये इस पुस्तिका के मुखपृष्ठ के अंदर वाला पृष्ठ तथा अंतिम खाली पृष्ठ का प्रयोग करें।

12. परीक्षा के उपरान्त *ओ० एम० आर० उत्तर-पत्र एवं प्रश्न पुस्तिका दोनों* परीक्षा भवन में जमा करें

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 दण्ड का/की भागी होगा/होगी।