Question Booklet No. 10010

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

✓

Roll No.

Roll No. (Write the digits in words) .... (AJ) 297 ....

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 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

6.

(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.

Ag. Engg. (Ag. Statistics)   Code No. : **745**

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. Which one of the following represents the best estimate of the population mean ?
    (1) The sample mean
    (2) The mean of several sample means
    (3) The mode of several sample means
    (4) The median of several sample means

12. If you obtained a sample of data that was relatively normally distribution and had no extreme scores, which measure of central tendency would you opt for ?
    (1) Mode
    (2) Median
    (3) Mean
    (4) None of the above

13. If you have a population of scores that has a flat (i.e. not normal) distribution, then the distribution of many sample means will be :
    (1) Flat
    (2) Bimodal
    (3) Negatively skewed
    (4) Normal

14. For a set of data we find that we have a standard deviation of 42 and a sample size of 16. What is the standard error ?
    (1) 0.339
    (2) 2.95
    (3) 21.68
    (4) 10.5

15. If you obtain a one-tailed p-value of 0.02 then the equivalent two-tailed p-value is :
    (1) 0.01
    (2) 0.04
    (3) 0.02
    (4) 0.4

16. The probability that an effect has arisen due to sampling error given that the null hypothesis is true is :
    (1) Negligible
    (2) β
    (3) α
    (4) None of the above

17. If 36% of the variation in scores on y has been accounted for by scores on x, how much variance is unexplained ?
    (1) 64%
    (2) 36%
    (3) 6%
    (4) 0.6%

18. In an analysis using an unrelated t-test, you find the following result :
    Levene's Test for Equality of Variances : $F = 0.15 \ p = 0.58$
    This shows that the variances of the two groups are :
    (1) Dissimilar
    (2) Similar
    (3) Exactly the same
    (4) Indeterminate

19. All other things being equal, the more powerful the statistical test :
   (1) The wider the confidence intervals
   (2) The more likely the confidence interval will include zero
   (3) The narrower the confidence interval
   (4) The smaller the sample size

20. A power level of 0.3 means :
   (1) You have a 30% chance of detecting an effect
   (2) You have a 49% chance of detecting an effect
   (3) You have a 70% chance of detecting an effect
   (4) You have a 0.7% chance of detecting an effect

21. Fisher's Exact Probability Test is used when :
   (1) The calculations for χ^2 are too difficult
   (2) You have more than 25% of cells with expected frequencies of less than 5
   (3) You have a 3×2 contingency table
   (4) You have non-categorical data

22. Cramer's V is :
   (1) A victory sign made after performing Cramer's statistical test
   (2) A measure of effect based on standardized scores
   (3) A correlational measure of effect converted from χ^2
   (4) A measure of difference

23. Parametric one-way independent ANOVA is a generalization of :
   (1) The paired t-test   (2) The independent t-test
   (3) χ^2 (4) Parson's r

24. In linear regression, where only **one** variable predicts y, and F is statistically significant at $p = 0.049$, then :
   (1) $t = 0.049$ (2) $t = 0.0245$ (3) $t = 0.098$ (4) Cannot tell

25. A scree plot is a number of :
   (1) Variables plotted against variance accounted for
   (2) Variables plotted against factor loadings
   (3) Factors plotted against correlation coefficients
   (4) None of the above

26. Which of the following are assumptions underlying the use of multivariate statistics ?
  (1) Homogeneity of variance-covariance matrices
  (2) That we have equal sample sizes
  (3) That we have nominal-level data
  (4) None of the above

27. The Wilcoxon matched-pairs signed ranks test can be used when :
  (1) There are two conditions
  (2) The same participants take part in both conditions
  (3) There is at least ordinal level data
  (4) All of the above

28. The Mann-Whitney U involves :
  (1) The difference in the means for each condition
  (2) The sum of the ranks for each condition
  (3) Finding the difference in scores across conditions, then ranking these differences
  (4) The difference in ranks across conditions

29. If, in a repeated-measures design with two conditions, you have a small number of participants, with skewed, ordinal data, the most appropriate inferential test is :
  (1) Unrelated t-test   (2) Related t-test
  (3) Mann-Whitney U test   (4) Wilcoxon

30. ANCOVA shows us how likely it is that differences between conditions are due to sampling error, once means have been adjusted for the relationship between :
  (1) The dependent variable and the covariate
  (2) The independent variable and the covariate
  (3) The dependent variable and the independent variable
  (4) All of the above

31. The original unrotated matrix is usually rotated so that :
  (1) The factors are more significant
  (2) The mathematical calculations are easier
  (3) Interpretation is easier
  (4) All of these

32. IF X and Y are two random variables such that their expectations exist and $P(X \leq Y) = 1$, then :

(1) $E(X) < E(Y)$

(2) $E(X) \geq E(Y)$

(3) $E(X) = E(Y)$

(4) $E(XY) =$ Any Constant value

33. The points of inflexion of t-distribution are :

(1) $\sqrt{\dfrac{n}{n+1}}$
(2) $\sqrt{\dfrac{n}{n+2}}$
(3) $\sqrt{\dfrac{n}{n-2}}$
(4) $\sqrt{\dfrac{n+2}{n+1}}$

34. Supposing that in cluster sampling, Sw^2 represents the variance between the clusters and Sb^2 between clusters. What is the relation between Sw^2 and Sb^2 :

(1) $Sw^2 = Sb^2$
(2) $Sw^2 \geq Sb^2$
(3) $Sw^2 \leq Sb^2$
(4) $Sw^2 \neq Sb^2$

35. Factorisation theorem for sufficiency is known as :

(1) Rao-Blackwell theorem

(2) Cramer Rao theorem

(3) Chapman- Robins theorem

(4) Fisher-Neyman theorem

36. If T1 and T2 are two most efficient estimators with the same variance S^2 and the correlation between them is ρ, The variance of $(T1 + T2)/2$ is equal to :

(1) S^2
(2) ρS^2
(3) $(1+\rho) S^2/4$
(4) $(1+\rho) S^2/2$

37. Mann – Whitney test statistic U depends on the fact that :

(1) How many times Y's precede X's

(2) How many times X's precede Y's

(3) Both (1) and (2)

(4) Neither (1) nor (2)

38. If X is a random variable and its p.d.f. is $f(x,)$, $E(\log x)$ represents :

(1) Arithmetic mean

(2) Hormonic mean

(3) Geometric mean

(4) Logarithmic mean

39. The family of parametric distributions, for which has mean always less than variance :

(1) Polya's distribution

(2) Cauchy distribution

(3) Negative binomial distribution

(4) Normal distribution

40. The ratio of the likelihood function under Ho and under entire parametric space is called :

(1) Probability ratio

(2) Sequential probability ratio

(3) Likelihood ratio

(4) None of the above

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. When is a variable said to follow Gamma distribution ? What are the properties of Gamma distribution ?

2. State Neyman-pearson Lemma and give its utility.

3. Give statistical model and appropriate analysis of variance table for split plot design.

4. How will you test the significance of a partial regression coefficient ?

5. Differentiate between complete tand partial confounding.

6. Discuss in detail clustering. Explain different methods of clustering.

7. Discuss power of a test and power function.

8. Explain the method of principal component analysis.

9. State Cramer Rao inequality for lower bound of variance of an estimator.

10. Discuss optimum allocation.

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Roll No. : ....

Q. No. :

Roll 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 कागज़ 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 है। 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 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 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 दंड का/की भागी होगा/होगी।