

RET/13/Test B**745****Agricultural Statistics**

Question Booklet No.

(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.
2. Deposit *both OMR Answer Sheet and Question Booklet* at the end of the Test.
3. You are not permitted to leave the Examination Hall until the end of the Test.
4. 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 – 2013

No. of Questions : 50

Time : 2 Hours

Full Marks : 200

- Note :**
- (i) This Questions 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. One Horse Power (HP) is expressed in term of watt which is
(1) 720 (2) 786 (3) 746 (4) None of these
2. Number of segments present in insect head is :
(1) Two (2) Four (3) Six (4) Seven
3. Deficiency symptom of sulphur first appears an :
(1) Younger leaves (2) Older leaves
(3) Middle leaves (4) None of these
4. Protein content in lentil is :
(1) 18% (2) 25% (3) 16% (4) 20%
5. Demonstration showing how to do things is called
(1) Method demonstration (2) Result demonstration
(3) Training (4) Frontline demonstration
6. Dithane M-45 is a :
(1) Bactericide (2) Insecticide (3) Fungicide (4) Nematicide
7. Jamunapari is a breed of :
(1) Cow (2) Goat
(3) Buffalo (4) None of the above
8. Select the correct formula of urea
(1) $H_2NCO_2NH_2$ (2) $HNCONH$
(3) H_2NCONH_2 (4) H_4NCONH_4
9. The measure of central tendency is
(1) Median (2) Mode
(3) Mean (4) All of the above
10. On which of the following plant Gregor Mendal perform his classic experiment ?
(1) Gram (2) Maize (3) Pea (4) Rice

11. Two random variables X and Y are said to be independent if :
- (1) $E(XY) = 1$ (2) $E(XY) = 0$
(3) $E(XY) = E(X)E(Y)$ (4) $E(XY) = \text{Any Constant value}$
12. If X and Y are two random variables, then :
- (1) $\{E(XY)\}^2 = E(X)^2 E(Y)^2$ (2) $\{E(XY)\}^2 = E(X^2 Y)^2$
(3) $\{E(XY)\}^2 \geq E(X)^2 E(Y)^2$ (4) $\{E(XY)\}^2 \leq E(X)^2 E(Y)^2$
13. The mean and variance of a binomial distribution are 8 and 4, respectively, then $P(X) = 1$ is equal to :
- (1) $\frac{1}{2^{12}}$ (2) $\frac{1}{2^4}$ (3) $\frac{1}{2^6}$ (4) $\frac{1}{2^8}$
14. The family of parametric distributions, for which the mean and variance does not exist is :
- (1) Polya's distribution
(2) Cauchy distribution
(3) Negative binomial distribution
(4) Normal distribution
15. The points of inflexion of t-distribution are :
- (1) $\pm \sqrt{\frac{n}{n+1}}$ (2) $\pm \sqrt{\frac{n}{n-2}}$ (3) $\pm \sqrt{\frac{n}{n+2}}$ (4) $\pm \sqrt{\frac{n+2}{n}}$
16. The variate $\sqrt{\chi_n^2}$ will be distributed as :
- (1) Fisher's t with n d.f. (2) Gamma Distribution
(3) Exponential Distribution (4) Chi-Distribution
17. F-distribution curve in respect of tails is
- (1) Negative skewed (2) Positive skewed
(3) symmetrical (4) Asymmetrical
18. Two stage sampling design is more efficient than single stage sampling if the correlation between units in the first stage is :
- (1) Negative (2) Positive
(3) Zero (4) None of the above

19. Supposing that in cluster sampling, S_w^2 represents the variance between the clusters and S_b^2 between clusters. What is the relation between S_w^2 and S_b^2 :
- (1) $S_w^2 = S_b^2$ (2) $S_w^2 \geq S_b^2$ (3) $S_w^2 \leq S_b^2$ (4) S_w^2 and S_b^2
20. In case of inverse sampling, the proportion p of m units of interest contained in a sample of n units is :
- (1) m/n (2) $(m-1)/n$
(3) $(m-1)/(n+1)$ (4) $(m-1)/(n-1)$
21. Sample standard deviation $\sqrt{\frac{\sum(X_i - \bar{X})^2}{n-1}}$ as an estimate of population standard deviation is :
- (1) unbiased and efficient (2) unbiased and inefficient
(3) biased and efficient (4) biased and inefficient
22. The concepts of consistency, efficiency and sufficiency are due to :
- (1) J. Neyman (2) R.A. Fisher
(3) C.R. Rao (4) J. Berkson
23. If T_n is an unbiased estimator of θ , then e^{T_n} is a :
- (1) Unbiased estimator of e^θ
(2) Consistent estimator of e^θ
(3) MVU estimator of e^θ
(4) Biased estimator of e^θ
24. When coefficient of contingency $C=1$, it indicates
- (1) High degree of association
(2) Low degree of association
(3) Low degree of dissociation
(4) Nothing
25. Neyman-Pearson lemma provides :
- (1) An unbiased test
(2) A most powerful test
(3) An admissible test
(4) Minimax test

26. The ratio of likelihood function under H_0 and under entire parametric space is called :
- (1) Probability ratio
 - (2) Sequential probability ratio
 - (3) Likelihood ratio
 - (4) Ratio
27. A test which maximizes the power of the test for fixed α is known as :
- (1) Optimum Test
 - (2) Randomized test
 - (3) Bayes test
 - (4) Likelihood ratio test
28. Equality of two population variances can be tested by :
- (1) Bartlett's test
 - (2) F-test
 - (3) Both (1) and (2)
 - (4) neither (1) or (2)
29. The ratio between sample and within sample variance follows :
- (1) F distribution
 - (2) Z distribution
 - (3) T distribution
 - (4) Chi square distribution
30. Most of the nonparametric methods utilize measurements on :
- | | |
|--------------------|-------------------|
| (1) Interval scale | (2) Ratio scale |
| (3) Ordinal scale | (4) Nominal scale |
31. If in Wilcoxon's signed rank test, the sample size is large, the statistic T^+ is distributed with mean :
- | | |
|-----------------|----------------|
| (1) $n(n+1)/4$ | (2) $n(n+1)/2$ |
| (3) $n(2n+1)/4$ | (4) $n(n-1)/4$ |

32. Regression coefficient is independent of :
- (1) origin
 - (2) scale
 - (3) Both origin and scale
 - (4) Neither origin nor scale
33. If the assumption of homoscedasticity of $\sigma^2_{Y/X}$ is not true in a linear regression model one must use :
- (1) Curvilinear regression
 - (2) Orthogonal polynomial
 - (3) Weighted regression
 - (4) Any of the above
34. The function $1/Y = \alpha\beta X + \gamma$ for α, β and $\gamma > 0$ represent :
- (1) Logistic growth curve
 - (2) Gompertz curve
 - (3) Equilateral hyperbola
 - (4) Exponential growth curve
35. The range of homogeneity error in reference to index numbers is :
- | | |
|-------------|---------------------------|
| (1) 0 to 1 | (2) 0 to ∞ |
| (3) -1 to 1 | (4) $-\infty$ to ∞ |
36. Which of the following is a contrast :
- | | |
|--------------------------------|-------------------------------|
| (1) $3T_1 + T_2 - 3T_3 + T_4$ | (2) $T_1 + 3T_2 - 3T_3 + T_4$ |
| (3) $-3T_1 - T_2 + T_3 + 3T_4$ | (4) $T_1 + T_2 + T_3 - T_4$ |
37. If a plant breeder includes s species and n strains within each species, he has to analyze the data according to :
- | | |
|------------------------|-------------------------|
| (1) Fixed Effect model | (2) Nested Model |
| (3) Mixed model | (4) Random Effect model |
38. If the entries in rows of a latin square are same as its columns, the latin square is called :
- | | |
|----------------|--------------------|
| (1) conjugate | (2) Self conjugate |
| (3) orthogonal | (4) Symmetric |

- 39.** All contrasts representing the effects of a 2^n factorial are :
- (1) Linear contrasts
 - (2) Orthogonal contrasts
 - (3) Both (1) and (2)
 - (4) Neither (1) nor (2)
- 40.** The accuracy of estimates after confounding in sub plots increases :
- (1) For main plots treatments
 - (2) For all sub plots treatments
 - (3) For all sub plot treatments except those which are confounded
 - (4) For no treatments

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. Differentiate between complete and partial confounding.
2. Write the set of orthogonal contrasts for main effects in 2^2 factorial experiment.
3. Discuss the statistical model for a split plot design.
4. What is meant by curvilinear regression ?
5. Give the tests for testing the linearity of regression.
6. What are the assumptions made in linear regression ?
7. Give the concept of critical region.
8. State Neyman-pearson Lemma and give its utility
9. State Cramer Rao inequality for lower bound of variance of an estimator.
10. Discuss Neyman's optimum allocation.

Roll No. :

Q. No. :

Roll No. :

Q. No. :

Roll No. :

Q. No. :

Roll No. :

Q. No. :

Roll No. :

Q. No. :

FOR ROUGH WORK

