RET/15/Test B | **745** | **Ag. Engg. (Ag. Statistics)**

Question Booklet No. **01**

*(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. "Fluid mosaic model" relates to the structure of :
   (1) Cell wall
   (2) Protoplasm
   (3) Plasma membrane
   (4) Nucleic acid

2. Spongy tissue of mango is a :
   (1) Bacterial disease
   (2) Physiological disease
   (3) Viral disease
   (4) Fungal disease

3. A purpose of initiating a conscious and purposeful action is called :
   (1) Education (2) Motivation (3) Action (4) Coordination

4. Yellow colour of egg is due to :
   (1) Carotene (2) Xanthophyll (3) Anthocyanin (4) Vitamin B

5. During prophase-I of meiosis crossing over occurs at :
   (1) Zygotene (2) Pachytene (3) Diplotene (4) Diakinesis

6. In which crop the use of Blue-Green Algae as a bio-fertilizer will be most useful ?
   (1) Maize (2) Potato (3) Rice (4) Sugarcane

7. Lycopene pigment is present in :
   (1) Beetroot (2) Tomato (3) Radish (4) Chilli

8. Ooze test is done to detect :
   (1) Bacterial disease
   (2) Fungal disease
   (3) Viral disease
   (4) All of these

9. Number of chromosome in wheat endosperm is :
   (1) 21 (2) 42 (3) 63 (4) 14

10. Acridine orange is used for inducing :
   (1) DNA denaturation
   (2) Mutagenesis
   (3) Chiasma formation
   (4) Bacterial transduction

11. If X is a random variable, $E(e^{tx})$ is known as :

(1) Characteristic function
(2) Moment generating function
(3) Probability generating function
(4) Probability mass function.

12. The family of parametric distributions which has mean always less than variance is :

(1) Beta distribution
(2) Lognormal distribution
(3) Weibull distribution
(4) Negative Binomial distribution

13. Pearson's constant for a normal distribution with mean μ and variance σ^2 are :

(1) $\beta_1 = 3, \beta_2 = 0, \gamma_1 = 0, \gamma_2 = -3$
(2) $\beta_1 = 0, \beta_2 = 3, \gamma_1 = 0, \gamma_2 = 0$
(3) $\beta_1 = 0, \beta_2 = 0, \gamma_1 = 3, \gamma_2 = 0$
(4) $\beta_1 = 0, \beta_2 = 3, \gamma_1 = 0, \gamma_2 = 3$

14. If we have a sample of size n from a population of of N units, the finite population correction is

(1) $\frac{N-1}{N}$ (2) $\frac{n-1}{N}$ (3) $\frac{N-n}{N}$ (4) $\frac{N-n}{n}$

15. Rao - Blackwell theorem enables us to obtain minimum variance unbiased estimator through :

(1) Unbiased estimators
(2) Complete statistics
(3) Efficient statistics
(4) Sufficient statistics

16. The ratio of between two sample variances follows :

(1) F Distribution
(2) Z Distribution
(3) t Distribution
(4) χ^2 Distribution

17. Range of statistic t is :

(1) -1 to 1 (2) $-\infty$ to $+\infty$ (3) 0 to ∞ (4) 0 to 1

18. The statistic H under the Kruskal - Wallis test is approximately distributed as :

(1) Student's t
(2) Snedecor's F
(3) *Chi Square*
(4) Normal deviate Z

19. Regression coefficient is independent of :

(1) Scale (2) Origin

(3) Both origin and scale (4) Neither origin nor scale

20. If Σ (variance covariance matrix) is known or the sample is large then to test the hypothesis $H_0 : \mu_1 = \mu_0$ against

$H_1 : \mu_1 \neq \mu_0$, the test statistic used is :

(1) Students t (2) Hotellng's T^2 (3) Mahalanobis D^2 (4) χ^2

21. If in a Latin square design with v treatments, row degrees of freedom = column degrees of freedom = treatment degrees of freedom = error degrees of freedom, then v is equal to :

(1) 3 (2) 9 (3) 18 (4) 27

22. Cluster sampling is better than simple random sampling if the intra-class correlation coefficient is :

(1) positive and less than one (2) negative

(3) one (4) Zero

23. If every level of a factor is taken at every level of some other factor in an experiment, it is known as :

(1) Crossed classification (2) Nested classification

(3) Hierarchical Classification (4) Both (2) and (3)

24. If $\beta_{YX} > 1$, then β_{XY} is :

(1) Less than 1 (2) Greater than 1 (3) Equal to 1 (4) Equal to 0

25. For the exponential distribution,

$$f(x\ ;\ \theta) = \frac{1}{\theta} e^{-x/\theta} \quad ;\quad x > 0,\ \theta > 0$$

the estimator $\Sigma\, x_i / \text{n}$, based on a sample of size n, is an unbaised estimator of :

(1) $1/\theta$ (2) $1/\theta^2$ (3) θ (4) θ^2

26. To test the randomness of a sample, the appropriate test is :

(1) Median Test (2) Sign Test (3) Run Test (4) Page's Test

27. In nonparametric statistics, usually the confidence interval is find out :

(1) Population mean
(2) Population median
(3) Population mode
(4) Population C. V.

28. Chi square test is :

(1) Parametric
(2) Nonparametric
(3) Parametric and Nonparametric both
(4) Neither Parametric nor Nonparametric

29. Homogeneity of three or more population correlation coefficients can be tested by :

(1) t - test (2) Z - test (3) χ^2- test (4) F- test

30. The statistic t for testing the hypothesis correlation coefficient $\rho = 0$, based on a sample of size n from a bivariate population has degree of freedom :

(1) n (2) $n-1$ (3) $n-2$ (4) $n-3$

31. For testing the equality of variances of more than two populations, the test applied is :

(1) t - test (2) F - test (3) Z - test (4) Barteltt's - test

32. The relation between the mean and variance of χ^2 distribution with n degree of freedom is :

(1) mean = 2 variance
(2) 2 mean = variance
(3) mean = variance
(4) mean > variance

33. Stratified sampling comes under the category of :

(1) Subjective Sampling
(2) Purposive Sampling
(3) Restricted Sampling
(4) Unrestricted Sampling

34. Crammer - Rao inequality with regard to the variance of an estimator provides :

(1) upper bound on the variance
(2) lower bound on the variance
(3) asymptotic variance of an estimator
(4) Neither lower nor upper bound on the variance

35. In general under the field condition the result of agricultural experiment is treated reliable when the value of coefficient of variation (CV) is :

(1) Below 25 % (2) Above 25 % (3) Below 100 % (4) Above 100 %

36. Relative efficiency (RE) of design 1 over the design 2 is the ratio of

(1) Inverse of the MSE of design 1 to inverse of the MSE of design 2.

(2) MSE of design 1 to MSE of design 2.

(3) Inverse of the SSE of design 1 to inverse of the SSE of design 2.

(4) SSE of design 1 to SSE of design 2.

37. In the split plot design mean square error (MSE) due to main plot is generally :

(1) Less than MSE to sub plot.

(2) Greater than MSE due to sub plot.

(3) Equal to MSE due to sub plot.

(4) Twice MSE due to sub plot.

38. If the same effect is confounded in all the replicates, it is known as :

(1) Partial confounding

(2) Perfect confounding

(3) Complete confounding

(4) Incomplete confounding

39. Lahiri's method for selection of a sample is used in :

(1) Simple random sampling

(2) Systematic sampling

(3) Stratified sampling

(4) Probability proportional to size (PPS) sampling

40. A population variance is denoted as σ^2 and size of sample as n, then the standard error mean is defined as :

(1) $\frac{\sigma^2}{n}$ (2) $\frac{\sigma}{n}$ (3) $\frac{\sigma}{\sqrt{n}}$ (4) $\frac{\sigma^2}{\sqrt{n}}$

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 exponential distribution ? What are the properties of exponential distribution ?

2. Give the formula for mean and its variance in systematic sampling.

3. Give statistical model and appropriate analysis of variance table of an 2^3 factorial experiment conducted in a RBD with 3 replications.

4. What do you understand by confounding ?

5. Give statistical model for the analysis of variance for split plot design.

6. Discuss the assumptions made in linear regression.

7. Write the formula for multiple correlation coefficient $R^2_{1.23}$ in terms of simple correlation coefficients.

8. Explain the method of Cluster analysis.

9. When a test called a minimax test ?

10. What do you understand by ordered statistics ?

Q. No. :

Roll No. : .....

Q. No. :

Q. No. :

Roll No. : .....

Q. No. :

Roll No. : .....

Q. No. :

FOR ROUGH WORK