

Sl. NO. **Course name and credit hrs.: Fundamentals of Quantitative Genetics [MGPB0503 (2-1-0)]**

MCQ TYPE

1. In RBD design, the error degree of freedom is..... (Where, t: treatment, e: error and r: replication)
e-1
r-1
t-1
(r-1) (t-1)
2. Choice of experimental design depends
Number and nature of genotypes under study
Objective of the experiment
Availability of the resources
All of these above
3. Which one of the following is not the principles of experimental design
Randomization
Treatment
Replication
Local control
4. Degree of freedom is
Sum of square due to error
Number of independent comparisons
Testing of significance level
All of these above
5. Variance and covariance are?
1st order statistics
2nd order statistics
3rd order statistics
All of these above
6. Choose the incorrect statements?
Association between characters is due to linkage and pleiotropy
Correlation measures the degree and direction of association between two or more variables
Correlation analysis involves 3rd order statistics
All of the above
7. Choose the correct statement in regard to correlation
Range is -1 to +1
Unit free
2nd order statistics
All of these above

8. Choose the incorrect statement in regards to simple correlation

Denoted by r^2 .

Can be calculated from un-replicated data set

Involves more than two variables

All of these above

9. Which one the following statistical tools used to measure the cause of association between variables?

Correlation analysis

Path analysis

Metroglyph analysis

All of the above

10. A researchers plan to conduct the experiment in the field where fertility gradient is in one direction only. Suggest which experimental design he has to follow?

SPD

LSD

RCBD

All of the above

11. Researchers want to test a large number of genotypes in limited space, then suggest which experimental design he has to follow?

LSD

Augmented design

Factorial design

RBD

12. Which one of the following parental combinations gives maximum hybrid vigor

Parents from genetically divergent cluster

Parents from genetically similar cluster

Parents from intra-cluster

All of these above

13. Selection intensity refers to

Proportion of plants to be selected

Number of selections to be imposed on the base population

Changes in the frequency of selected individuals

Difference between mean of base population from selected population

14. Improvement in the mean genotypic vale of selected plants over the base population is known as

Genetic differential

Genetic advance

Response to selection

Genetic gain

15. The difference between the mean phenotypic value of selected plants and the base population is known as

Selection differential

- Response to selection
 Selection intensity
 None of the above
16. The ratio of additive genetic variance to the total variance is referred as
 Heritability
 Coheritability
Narrow sense heritability
 Broad sense heritability
17. Which one of the following is or are prerequisite for effective selection
 Presence of genetic variation
 Heritability
 Magnitude of variation
All of these above
18. Most efficient ways of measuring the genetic variability is or are
 Range
 Standard Error
Standard Deviation
 Coefficient of variation
19. Which one of the following is unitless
Coefficient of Variation
 Standard deviation
 Standard error
 Variance
20. Genetic advance (GS) = $i\sigma p h^2$ where, σp is
 Intensity of selection
Phenotypic standard deviation
 Genotypic standard deviation
 Response to selection
21. Which is not an assumption for Hardy-Weinberg principles
 Random mating population
 Absence of evolutionary forces
Selective mating
 None of these above
22. Which is incorrect in regard to quantitative traits
 Controlled by many genes
 Greatly influenced by environmental factors
Classified into distinguish classes
 None of these above
23. Which is not a measure the variability present in the population
 Range
 Coefficient of variation
 Variance
Kurtosis
24. A small circle by which the position of a genotype is presented on the graph is known as

- Line diagram
Glyph
Cluster diagram
Semi graph
25. Choose the correct match
Classical selection index-Anderson (1957)
Restricted selection index- Smith (1936)
General selection index- Nordskog (1936)
Classical selection index-Anderson (1936)
26. A line diagram which is constructed with the help of simple correlation coefficient among the various traits under study is referred as
Path diagram
Cluster diagram
Glyph
None of these above
27. Heritable portion of the total variance is referred as
Heritability
Genetic advance
Selection differential
Coheritability
28. The concept of path analysis was originally developed by
Wright-1936
Wright-1921
Wright-1959
Dewey and Lu-1959
29. Which of the following biometrical analysis provides the information on residual effects
Correlation coefficient analysis
 D^2 - statistics
Metroglyph analysis
Path coefficient analysis
30. Choose the incorrect statement regarding Metroglyph analysis
Semi graphical approach of diversity study
Used for both replicated and un replicated data set
Pattern of variability is depicted by glyph
Developed by Anderson in 1927
31. Selection will be rewarding only when
 $GCV > PCV$
 $PCV > GCV$
 $GCV = PCV$
 $ECV > GCV$
32. Choose the incorrect statement regarding D^2 -statistics
P. C. Mahalanobis(1928)- Originally develop
Rao (1952)-Suggested the used of this technique in plant breeding
Possible for both replicated and un replicated data sets

- Numerical approach of diversity analysis
33. Choose the incorrect statement regarding Metroglyph analysis
- Large number of genotypes can be study at a time
 - Suffers from the problems of overlapping of glyph while inclusion of large numbers of genotypes
 - Length of rays on glyph represent the variation for character
 - Analysis is based on second order statistics**
34. Choose the incorrect statement regarding D2-statistics
- Provides reliable estimates of genetic divergence
 - Large number of genotypes can be evaluated at a time
 - Divergence study is based on estimation of variance and covariance
 - Analysis is possible for un replicated data set**
35. Hayman's graphical approach of diallel analysis provides information on which one the following parameters
- Additive genetic variance
 - Dominance variance
 - Dominance effects
 - All of these above**
36. A researcher has 10 parentals inbred of maize. He needs to generate the F1 hybrids for their experimentation using Griffing 1956 diallel method-I. How many F1 he can generate including reciprocal crosses?
- 90**
- 100
 - 45
 - 55
37. On Vr-Wr graph, when the regression line passes above the origin cutting the Wr axis shows which one of the following
- Dominance
 - Partial dominance**
 - Over dominance
 - No dominance
38. In Hayman's graphical approach of diallel analysis, $W_{ri} = W_r - bV_{ri} + bV_{ri}$. The W_r stands for
- Array mean of variances**
 - Array mean of covariance
 - Variance of parents
 - Regression coefficient
39. A researcher wants to conduct an experiment of combining ability using 12 brinjal genotype. His guide suggested him to follow the Griffing 1956 diallel mating system method-II. Then how many of total entry he has to evaluate?
- 78**
- 120
 - 144
 - 66
40. Average performance of a genotype in a series of hybrid combination referred as

- SCA
GCA
 GCA effects
 SCA effects
41. Which mating design permits the estimation of maternal effects
 Half Diallel
Full Diallel
 Line x tester
 Partial Diallel
42. Who gave the concept of partial diallel
 John
Kempthorne
 Rawlings and Cockerham
 Hayman
43. Line x Tester is which order statistics
 1st order
 2nd order
Both 1st and 2nd order
 3rd order
44. Line X Tester involves.....crosses
 mf/2
mf
 m/f
 2mf
45. The number of double crosses is
 $n(n-1)/2$
 $n(n-1)(n-2)(n-3)/8$
 $n(n+1)(n-2)$
 None of thses
46. Line x Tester analysis is unable to detect estimate which of the following
 Dominance gene action

Epistatic gene action

GCA effects

None of these

47 If in a partial diallel $n=10$ and $s=5$ which of the following will be value of k

3

5

6

2

48 On V_r - W_r graph, when the regression line passes through the origin, it indicates which of the following?

Over dominance

Partial dominance

Complete dominance

No dominance

49 Who developed the concept of augmented design

Federer

Kemphorne

Dewey & Lu

Mather

50 Who gave the term gene pool

Johannsen

Dobzhansky

Burton

Mendel

51 Who developed the concept of biparental mating

Comstock and Robinson

Smith

Sewall Wright

Cavalli

52 Which of the following scientists provided TTC

Keirsey and Jinks

Dudley

Hayman

Kemphorne

53 Who laid the foundation of quantitative genetics in 1918

Hardy and Weinberg

Fisher

Karl Pearson

Francis Galton

54 The inheritance of quantitative character

Monogenic

Polygenic

Both A and B

Oligogenic

55 Which of the following is correct

Qualitative traits are governed by.....

Additive gene action

Dominance gene action

Epistasis gene action

Both dominance and epistasis

56 In which year Cavalli provided joint scaling test

1952

1953

1950

1951

57 Who developed the concept of D^2 statistics

Sewall Wright

Mahalanobis P.C.

Mather, K.

Rao, C.R.

- 58 In which year Perkins and Jinks provided separate model of stability
1968
1966
1971
1963
- 59 Who Proposed the theory of alleles
Dudley,J.W.
Dewey,O.R
Hayman,B.I
Johnson,H.W
- 60 Who developed the concept of metroglyph analysis
Anderson
Griffing
Haymen
Dewey
- 61 Which method of diallel is most commonly used
Method I
Method II
Method III
All
- 62 Which is correct regarding L x T analysis
Reflect breeding value of parental lines
Estimate SCA effect of F1's
Estimate GCA effects of Parents
All
- 63 If $n = 8$, then how many F1's can be generated in full Diallel mating design
56
28
32
36

- 64 In Hayman graphical approach of diallel analysis, if the value of H1/D ratio is greater than zero but smaller than one, then which type of gene action present
- Dominance
 - Complete dominance
 - No dominance
 - Partial dominance**
- 65 Which is/are incorrect about Vr-Wr graph
- Constructed with the help of Variance array (Vr) and covariances between parents and their offspring (Wr)
- The graph is drawn by keeping the value of Vr on Y-axis**
- The graph is drawn by keeping the value of Wr on Y-axis
- All
- 66 Griffing's Diallel analysis was proposed by
- Griffing 1946
 - Griffing 1956**
 - Griffing 1966
 - Griffing 1965
- 67 A researcher started their experiment using ten inbred lines of maize. He generated F1's as well as reciprocal crosses but in their studies includes only F1's. So which method of diallel analysis can be used to inferences their result
- Method 1
 - Method 2
 - Method 3
 - Method 4**
- 68 Which is/are incorrect regarding GCA
- Average effect of parent in a series of cross combinations
 - Estimated from half sib family
 - Estimate of breeding value
 - Help in selection of hybrid combination**

- 69 The error degree of freedom (d.f.) in ANOVA for combining ability in partial diallel analysis is
 (ns/2)-1
 n-1
(r-1) [(ns/2)-1]
 [(rns/2)-1]
- 70 Which genetic component(s) is/are not estimated in partial diallel analysis
 GCA effects
SCA effects
 GCA variances
 SCA variances
- 71 Choose the correct ones regards number of crosses generated in partial diallel analysis, if number of parents (n) =6
 15
 21
9
 18
- 72 L x T analysis is a modification of
 Double top cross
 Double cross
 North Carolina Design
Top cross
- 73 The degree of freedom (d.f.) for female in line x tester analysis is/are (where, r, m, and f = replication, male and female, respectively)
 f-1
 m-1
(m-1)(f-1)
 rmf-1
- 74 Which is not a characteristic of ideal tester
 Wider adaptability

Highest yielder

Broad genetic bases

None of these

75 If $GCA > SCA$, which one of the following statements (s) is or are correct

Practice heterosis breeding

Initiate recurrent selection

Progeny selection effective in early generation

Selection effective in later generation

76 High SCA Effects due to interaction of

High GCA x high GCA

High GCA x low GCA

Low GCA x low GCA

All

77 Who provide the first approach for stability analysis

Jink and Parking

Mather and Jink

Finlay and Wilkinson

Everhart and Russell

78 Prediction of performance of double cross hybrid was advocated by

Anderson (1934)

Jenkins (1934)

Kemphorne (1957)

Hull (1914)

79 Choose incorrect statement regarding quantitative trait

Greatly influenced by environmental stimulus

Continuous variations

Not grouped into distinct class

Governed by one or few genes

80 The Concept of population genetics was laid by

Hardy and Weinberg

Francis Galton

Charles Darwin

G J Mendel

NOTE: Bold one is correct answer