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## Genetics II

1. Who gave the theory of path coefficient? (a) Sewell Wright (b) Fisher (c) Haldane (d) Hazel [Answer>>](#)
2. Name the scientist who defined selection as "differential reproductive rate" ? (a) Hazel (b) Lush (c) Lerner (d) Falconer [Answer>>](#)
3. Heritability of a trait is given by (a)  $r_{AP}$  (b)  $b_{AP}$  (c)  $b_{GP}$  (d) none of above [Answer>>](#)
4. Inbreeding coefficient (F) in the first generation when half sibs are bred is (a) 0 (b) 0.062 (c) 0.125 (d) 0.250 [Answer>>](#)
5. Inbreeding coefficient (F) through full sib (brother X sister) mating reaches  $> 0.986$  after how many generations (a) 10 (b) 15 (c) 20 (d) none of the above [Answer>>](#)
6. Variance of change in gene frequency after one generation of sampling is (a)  $\frac{1}{2}N(p_0q_0)^2$  (b)  $p_0q_0/2N$  (c)  $1 - p_0q_0$  (d) none of the above [Answer>>](#)
7. Response is not a function of (a) Selection intensity (b) Mean of the trait (b) phenotypic standard deviation of trait (d)  $h^2$  of the trait [Answer>>](#)
8. Individual merit and family merit as basis of selection was proposed by \_\_\_\_\_ (a) Hazel and Lush (b) Hazel (c) Lush (d) Lerner [Answer>>](#)
9. Another name of selection intensity is \_\_\_\_\_ (a) Standardized selection differential (b) Weighed selection differential (c) Selection differential (d) Selection coefficient [Answer>>](#)
10. Selection procedure not widely used in poultry breeding is \_\_\_\_\_ (a) Individual selection (b) family selection (c) progeny testing (d) sib selection [Answer>>](#)
11. The selection index method was introduced in animal breeding by \_\_\_\_\_ (a) Lush (b) Smith and Hazel (c) Lerner (d) Comstock [Answer>>](#)
12. A locus will contribute to a change of mean value on inbreeding only if \_\_\_\_\_ (a) Dominance is absent (b) There is epistasis (c) There is partial dominance (d) Dominance is not zero [Answer>>](#)
13. The covariance of the mean of the offspring and the mid parent is \_\_\_\_\_ (a)  $V_A$  (b)  $\frac{1}{2}V_A + \frac{1}{4}V_D$  (c)  $\frac{1}{2}V_A$  (d)  $V_G$  [Answer>>](#)
14. Intra-sire regression of offspring on dam estimates (a) heritability (b) repeatability (c) half of heritability (d) twice

the heritability [Answer>>](#)

15. By increasing the intensity of selection, breeder can increase the \_\_\_\_\_ (a) response per unit time (b) response per generation (c) realized response (d) realized heritability [Answer>>](#)

16. The occurrence of heterosis on crossing is dependent on (a) non-directional dominance (b) directional dominance (c) presence of dominance (d) presence of heterotic genes [Answer>>](#)

17. A measure of variation which is correlated with the mean is \_\_\_\_\_ (a) variation (b) standard deviation (c) coefficient of determination (d) coefficient of variation [Answer>>](#)

18. The mean performance of line when expressed as the deviation from the mean of all crosses is called \_\_\_\_\_ (a) G.C.A of line (b) S.C.A of line (c) G.C.A and S.C.A of line (d) Average effect of the line [Answer>>](#)

19. Reciprocal recurrent selection (RRS) is used to improve (a) only G.C.A (b) only S.C.A (c) Both G.C.A and S.C.A (d) None [Answer>>](#)

20. Reciprocal recurrent selection was first proposed by \_\_\_\_\_ in 1949 (a) Comstock, Robertson and Harvey (b) Comstock, Robinson and Harvey (c) Croas, Robertson and Fisher (d) Comstock, Lush and Hazel [Answer>>](#)

21. What increases or decreases the chance of fixation of a new mutant (a) Crossbreeding (b) Random drift (c) Selection (d) Inbreeding [Answer>>](#)

22. Variance due to general combining ability arises due to (a)  $V_A + V_{AA} + V_{AD}$  (b)  $V_A + V_{AA} + V_D$  (c)  $V_A + V_{AA} + V_{DD}$  (d)  $V_A + V_{AA} + V_{AAA}$  [Answer>>](#)

23. If the frequency of recessive gene in a population is 0.10, then what would be the frequency of this recessive gene after 4 generations of selection in which all recessive homozygotes are discarded (a) 0.001 (b) 0.071 (c) 0.005 (d) 0.021 [Answer>>](#)

24. The ratio of response to selection to selection differential is the: (a) degree of genetic determination (b) heritability in broad sense (c) realized heritability (d) heritability in narrow sense [Answer>>](#)

25. When response to selection has ceased, the population is said to be at (a) zero response (d) selection limit (c) Response limit (d) no response [Answer>>](#)

26. The maternal effect may show an asymmetry of response associated with (a) genes derived from dam (b) maternal component of the trait (c) Traits governed by xx chromosomes (d) traits governed by females hormones [Answer>>](#)

27. If additive gene action is most important for a trait, the best and simplest basis of selection is: (a) pedigree selection (b) individual selection (c) progeny testing (d) none [Answer>>](#)

28. If the environmental and genetic effects of a trait are different to distinguish the individual selection is: (a) advantageous (b) disadvantageous (c) equally efficient to other methods (d) none [Answer>>](#)

29. In an analysis of half sib families the component of covariance between sire is: (a)  $1/2 COV_A$  (b)  $1/4 COV_A$  (c)  $3/4 COV_A$  (d)  $COV_{AB}$  [Answer>>](#)

30. Precision of heritability estimate depends on its: (a) standard error (b) coefficient of variation (c) sampling variance (d) all the above [Answer>>](#)
31. The panmictic index at  $t^{\text{th}}$  generation is (a)  $P_t = (1+\Delta f)^t P_0$  (b)  $P_t = (1-\Delta f)^t P_0$  (c)  $(1-\Delta f_{t-1}) P_0$  (d) none above [Answer>>](#)
32. Highest genetic gain can be achieved by accurate estimation of breeding value by (a) sires of dams (b) dams of sires (c) sires of sires (d) dams of dams [Answer>>](#)
33. For predicting breeding value of a cow on basis of information on itself, its dam and paternal halfsibs we use \_\_\_\_\_ (a) Analysis of variance technique (b) Maximum likelihood technique (c) Multiple correlation technique (d) Multiple regression technique [Answer>>](#)
34. Family selection is better than individual selection when interclass correlation of phenotypic values is \_\_\_\_\_ (a) zero (b) 0.5 (c)  $>0.5$  (d)  $<0.5$  [Answer>>](#)
35. Faster rate of genetic improvement can be achieved in (a) dairy cattle for milk production (b) sheep for lamb production (c) Pig for litter size (d) broilers for growth rate [Answer>>](#)
36. In case of multiple trait selection, as compared to intensity of selection for each of the trait separately for 'n' traits under simultaneous selection, the selection intensity for combined selection would decrease by (a) n times (b)  $1/n$  times (c)  $1/\sqrt{n}$  times (d)  $2n$  times [Answer>>](#)
37. If fixed number of sires are tested under farm progeny testing, the improvement in management practices in cows will improve \_\_\_\_\_ (a) intensity of selection of sires (b) accuracy of selection of sires (c) Selection differential of sires (d) none [Answer>>](#)
38. The correlated response obtained for a trait when selection is done on another trait is due to \_\_\_\_\_ (a) Linkage effect (b) pleiotrophic effect (c) epistatic effect (d) dominance effect [Answer>>](#)
39. Hardy Weinberg law was formulated in the year (a) 1809 (b) 1908 (c) 1918 (d) 1928 [Answer>>](#)
40. Repeatability sets an upper limit to (a)  $V_A/V_P$  (b)  $V_G/V_P$  (c) both above (d)  $V_A/V_D$  [Answer>>](#)
41. In a population under H-W equilibrium, the maximum genotype frequency of heterozygote will be observed when the frequency of dominant gene is (a) 0.4 (b) 0.5 (c) 0.6 (d) 0.25 [Answer>>](#)
42. The genetic covariance of full sib is (a)  $1/2 V_A$  (b)  $1/4 V_A$  (c)  $1/2 V_A + 1/4 V_D$  (d)  $1/2 V_A + 1/2 V_D$  [Answer>>](#)
43. Number of generations 't' required to change the gene frequency from  $q_0$  to  $q_t$  is \_\_\_\_\_ (a)  $q_t - q_0$  (b)  $2(q_t - q_0)$  (c)  $1/q_t - 1/q_0$  (d) none above [Answer>>](#)
44. if 'L' is the load borne by the population, the average fitness of the population is \_\_\_\_\_ (a)  $1-L$  (b)  $L-1$  (c)  $1/L$  (d) none [Answer>>](#)
45. If gene frequency in migrants is the same as that in the groups from and to which they go, migration affects: (a) quality of population (b) no. of population (c) neither quality nor number (d) both quality and number [Answer>>](#)
46. If 25% have the recessive phenotype (aa) and the population is in equilibrium with respect to this locus, then q is

\_\_\_\_\_ (a) 0.25 (b) 0.5 (c) 0.75 (d) 1.00 [Answer>>](#)

47. The difference between the genotype value (G) and the breeding value (A) of a particular genotype is \_\_\_\_\_ (a) dominance deviation (b) no dominance (c) directional dominance (d) none of the above [Answer>>](#)

48. The quantitative traits are governed by genes having large phenotypic effects are called (a) quantitative genes (b) major genes (c) minor genes (d) polygenes [Answer>>](#)

49. The correlation between breeding values and phenotypic values is equal to the square root of \_\_\_\_\_ (a) repeatability (b) regression (c) response (d) heritability [Answer>>](#)

50. The resemblance between offspring and parents provide the basis for (a) discrete breeding (b) inbreeding (c) random breeding (d) selection breeding [Answer>>](#)

51. selection brings about many changes in the population. The ultimate interest of the breeder may be in \_\_\_\_\_ (a) change in gene frequency (b) change in population mean (c) change in variation (d) extruding the range of traits [Answer>>](#)

52. The sum of the additive or average effects for all loci influencing a trait is referred as (a) additive genetic variance (b) average breeding value (c) dominance variation (d) epistatic variation [Answer>>](#)

53. Sibs selection is recommended for (a) sex linked traits (b) sex limited traits (c) sex influenced traits (d) none of the above [Answer>>](#)

54. The first progeny testing scheme was launched in India during first five year plan at: (a) Hissar (b) Karnal (c) Ludhiana (d) Anand [Answer>>](#)

55. The BLUP method for sire evaluation was suggested by \_\_\_\_\_ (a) Lush (b) Henderson (c) S. Wright (d) Fischer [Answer>>](#)

56. Nili-Ravi breed of buffalo is formed in (a) Punjab (b) Maharashtra (c) UP (d) Gujarat [Answer>>](#)

57. Project directorate on cattle was established in \_\_\_\_\_ (a) 1990 (b) 1985 (c) 1987 (d) 1986 [Answer>>](#)

58. Equal parent index (EPI) is an expression of: daughter production (a) higher than sire and dam production (b) lower than sire and dam production (c) half way between sire and dam production (d) equal to sire and dam production [Answer>>](#)

59. Variation without natural discontinuities is called continuous variation and character that exhibit it are called (a) metric character (b) correlated character (c) neutral character (d) balanced character [Answer>>](#)

60. The precision of heritability estimate is known by the \_\_\_\_\_ (a) standard error (b) magnitude (c) method of estimation (d) experimental design [Answer>>](#)

61. The description of the covariance, applicable to any sort of relationship is (a) between half and full sibs (b) between offspring and mid parent (c) between offspring and one parent (d) all the above [Answer>>](#)

62. Sire intra-class correlation (t) is \_\_\_\_\_ times of  $h^2$  variance (a) 1/2 (b) 1/4 (c) 1 time (d) none above [Answer>>](#)

63. Disruptive process change gene frequency in a manner predictable in \_\_\_\_\_ (a) amount only (b) direction only

(c) both (d) none [Answer>>](#)

64. The strength of selection is expressed as (a) coefficient of selection (b) response to selection (c) selection differential (d) none [Answer>>](#)

65. if 's' is the coefficient of selection then the relative fitness of the genotype selected against is : (a) S (b) 1-S (c) S/2 (d) none [Answer>>](#)

66. Genetic drift in small population is an example of \_\_\_\_\_ (a) systematic process (b) dispersive process (c) none of the above [Answer>>](#)

67. Degree of genetic determination is (a)  $h^2$  in narrow sense (b)  $h^2$  in broad sense (c) additive variance (d) none [Answer>>](#)

68. When repeatability is low, multiple measurements gives \_\_\_\_\_ gain in accuracy (a) large (b) a little (c) none [Answer>>](#)

69. The proportion of phenotypic variation expressed by repeatability is (a) permanent genetic variance (b) permanent environmental variance (c) both (d) special environmental variance [Answer>>](#)

70. The regression of offspring and one parent ( $b_{op}$ ) is given by \_\_\_\_\_ (a)  $V_A/V_P$  (b)  $1/4 V_A/V_P$  (c)  $1/2 V_A/V_P$  (d)  $3/4 V_A/V_P$  [Answer>>](#)

## Answer Key

|      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|
| 1.a  | 11.b | 21.c | 31.b | 41.b | 51.b | 61.d |
| 2.b  | 12.d | 22.d | 32.c | 42.c | 52.b | 62.b |
| 3.b  | 13.c | 23.b | 33.d | 43.c | 53.b | 63.a |
| 4.c  | 14.c | 24.c | 34.c | 44.a | 54.a | 64.a |
| 5.c  | 15.b | 25.b | 35.d | 45.c | 55.b | 65.b |
| 6.b  | 16.b | 26.b | 36.c | 46.b | 56.a | 66.b |
| 7.b  | 17.d | 27.b | 37.b | 47.a | 57.c | 67.b |
| 8.c  | 18.a | 28.b | 38.b | 48.b | 58.c | 68.a |
| 9.a  | 19.c | 29.b | 39.b | 49.d | 59.a | 69.c |
| 10.c | 20.b | 30.c | 40.c | 50.d | 60.a | 70.c |

Courtesy

Dr. Bejoy John

Division of Animal Genetics

I.V.R.I, Izatnagar, Bareilly,

UP 243122

Email: [drbejoyjohn@rediffmail.com](mailto:drbejoyjohn@rediffmail.com)