

ANSWER KEYS																			
1	(b)	7	(d)	13	(b)	19	(b)	25	(b)	31	(c)	37	(b)	43	(a)	49	(b)	55	(c)
2	(d)	8	(a)	14	(b)	20	(c)	26	(b)	32	(b)	38	(a)	44	(c)	50	(b)	56	(c)
3	(a)	9	(a)	15	(c)	21	(b)	27	(b)	33	(b)	39	(c)	45	(a)	51	(d)	57	(b)
4	(b)	10	(b)	16	(c)	22	(d)	28	(b)	34	(b)	40	(d)	46	(c)	52	(c)	58	(b)
5	(c)	11	(a)	17	(a)	23	(a)	29	(c)	35	(d)	41	(d)	47	(c)	53	(a)	59	(b)
6	(b)	12	(c)	18	(c)	24	(b)	30	(d)	36	(c)	42	(c)	48	(c)	54	(a)	60	(c)

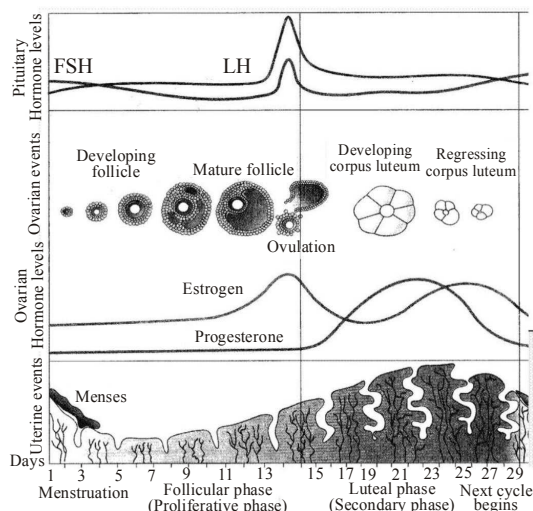


- (b) 'Saheli'—an oral contraceptive for the females was developed at Central Drug Research Institute (CDRI) in Lucknow, India.
- (d) *S. pneumoniae*
- (a) 4. (b) 5. (c)
- (b) Vasa efferentia are ductules leading from rete testis to vas deferens. The rete testis is an anastomosing network of tubules located in the hilum of the testicles that carries sperm from the seminiferous tubules to the vasa efferentia.
- (d) 8. (a) 9. (a) 10. (b)
- (a) Geitonogamy is the transfer of pollen grains from the anther to the stigma of another flower of the same plant. Although geitonogamy is functionally crosspollination involving a pollinating agent, genetically it is similar to autogamy since the pollen grains come from the same plant.
- (c) The lack of independent assortment in sweet pea and *Drosophila* is due to linkage.
- (b) The two chains are antiparallel, one aligned in 5' → 3' direction the other in 3' → 5' direction.
- (b) Alleles are defined as alternative form of same gene.
- (c) A pleiotropic gene regulates multiple traits (characteristics) in an individual.
- (c) Crossing of one F₁ progeny with male parent, e.g.,

RR	×	rr	
(red)		(green)	
↓		↓	
Rr	Rr	Rr	Rr
Red	Red	Red	Red
			F ₁ -progeny
		♀	
		(Rr)	
		×	♂
			RR
		↓	
RR	Rr	Rr	RR
↓	↓	↓	↓
red	red	red	red
(pure)	(dominant)	(dominant)	(pure)
- (a) A point mutation is a simple change in one base of the gene sequence. This is equivalent to changing one letter in a sentence, such as this example, where we change the 'c' in cat to an 'h':
Original: The fat cat ate the wee rat.
Point Mutation: The fat hat ate the wee rat.
- (c) Polygenic inheritance is the inheritance of traits which are dependent on the no. of genes such as the skin colour of human beings, eg. AaBB is black AaBB in neither dark nor black. AaBb is again wheatish Aabb is light and aabb is white colour.
- (b) Infections proteins are rich in prions. Prions are made of proteins without nucleic acid. It is the causal agent of scrapie disease of sheep.
- (c) In transition substitution a purine is replaced by another purine base (A with G or vice versa). In transversion substitution a purine is replaced by a pyrimidine base or vice versa. Frameshift mutation is a type of mutation where the reading of codons is changed due to insertion or deletion of nucleotides. Transition is the formation of RNA over the template of DNA.
- (b) Hershey and Chase used radioactive labeling of sulphur and phosphorus to clearly demonstrate that DNA, and not protein, is the material that carries hereditary information.
- (d) Okazaki fragments are short pieces of newly synthesized DNA. The production of each of these fragments is dependent on a beginning RNA primer. The small fragments are ultimately ligated (connected) together to form the lagging strand.
- (a)
- (b) Regulator is a gene which forms a biochemical for suppressing the activity of operator gene. Promoter is the gene which provides the point of attachment to RNA polymerase required for transcription of structural genes.

To find the genotype of hybrid test cross is done.

25. (b) Assertion and Reason are correct but Reason is not a correct explanation of Assertion.
Gene is the unit of inheritance which passes from one generation to the other through the gamete.
26. (b) Assertion and Reason are correct but Reason is not a correct explanation of Assertion.
One unit of map (cm) is therefore, equivalent to 1% of crossing over.
27. (b) Assertion and Reason are correct but Reason is not a correct explanation of Assertion.
In both grasshopper and humans male heterogameity is found and in both cases female homogameity is present.
28. (b) Assertion and Reason are correct but Reason is not a correction explanation of Assertion.
Wilkins, Watson and Crick get the Nobel prize for deciphering the double helical model of DNA
29. (c)
30. (d)



During menstrual or bleeding phase which comprises of 3 - 5 days out of 28 days menstrual cycle, the production of LH from the anterior lobe of the pituitary gland is considerably reduced. The withdrawal of this hormone causes degeneration of corpus luteum and therefore, progesterone production is reduced. Production of estrogens is also reduced in this phase.

31. (c)
32. (b) The word ampulla is derived from the Latin word 'flask'. Being the second portion of the fallopian tube, it is the intermediate dilated portion which immediately curves over the ovary. This is the common site of human fertilization as both the ovum and sperms are simultaneously transported here.
33. (b) 34. (b)
35. (d) Filiform apparatus helps in the entry of pollen tube into a synergid in ovule. Filiform apparatus is in the form of finger like projections comprising a core of micro fibrils enclosed in a sheath. It resembles transfer cells meant for short distance movement of metabolites. It is responsible for the absorption of food from the nucleus.

36. (c) A dominant gene would lead to the expression of its phenotype irrespective of the fact whether its allelic gene is dominant or recessive.
37. (b) Calvin Bridges demonstrated that in *Drosophila*, the sex is determined by ratio of the number of X chromosomes to the sets of autosomes.
38. (a) The seven traits are now known to be present on 4 chromosome. But they do not show linkage, because of large distances between them on the chromosome.
39. (c) During gastrulation, formation of three germs layers take place that differentiate into different types of tissues.
40. (d) Incomplete (partial or mosaic) dominance is the phenomenon where none of the two contrasting alleles or factors is dominant. The expression of the character in a hybrid or F_1 individual is intermediate or a fine mixture of the expression of the two factors (as found in homozygous state). Incomplete or mosaic inheritance is not an example of pre-mendelian concept of blending inheritance because the parental types reappear in the F_2 generation. It is however, considered by some workers to be an example of quantitative inheritance where only a single gene pair is involved. F_2 phenotypic ratio is 1 : 2 : 1, similar to genotypic ratio. Incomplete dominance is reported in flowers of Four O'Clock or *Mirabilis jalapa* and *Antirrhinum majus* (Snapdragon or Dog flower).
41. (d) Sickle-cell anaemia is an autosome linked recessive trait which is controlled by a single pair of allele Hb^A and Hb^s only the homozygous individuals for Hb^s , i.e., $Hb^s Hb^s$ shows the diseased phenotype. The heterozygous individuals are carriers ($Hb^A Hb^s$). Glutamic acid (Glu) is replaced by valine (Val) at sixth position of β -chain of haemoglobin molecule due to point mutation. This substitution occurs due to the single base substitution of the beta globin gene from GAG (Glu) to GUG (Val). Whereas, the other codes GGG, AAG, GAA do not codes for valine.
42. (c) In case of humans, the sex determining mechanism is XY type. Out of 23 pairs of chromosomes, 22 pairs are exactly same in both males and females called autosomes. A pair of X-chromosomes present in the female, whereas the presence of an X and Y chromosome are determinant of male characteristic. In case the ovum fertilises with a sperm carrying X-chromosome the zygote develops into a female (XX) and the fertilisation of ovum with Y-chromosome carrying sperm results into a male offspring.
43. (a) RNA processing occurs after transcription and before translation.
44. (c) 45. (a)
46. (c) DNA replication is an energy-consuming process that must have an input of energy to proceed. Energy is provided in the breaking of the triphosphate tails of each nucleotide.
47. (c) In Co-dominance F_1 generation resemble both the parents. Ex : Blood group inheritance.
48. (c) 49. (b) 50. (b) 51. (d) 52. (c) 53. (a)
54. (a) 55. (c) 56. (c) 57. (b) 58. (b) 59. (b)
60. (c)