

1. Booklungs are found in :
(1) Amoeba (2) Polystomella
(3) Euglypha (4) Arachnids
2. Silk is obtained from :
(1) Adult moth (2) Caterpillar stage
(3) Egg (4) Cocoon
3. Neurogenic heart is found in :
(1) Human beings (2) Rat
(3) Rabbit (4) Invertebrates
4. Epiphysis is also known as :
(1) Pineal (2) Pituitary
(3) Thyroid (4) Hypothalamus
5. Simplest and smallest form of amino acid is :
(1) Glycine (2) Proline
(3) Lysine (4) Argenine
6. PCOS is related to :
(1) Ovary (2) Uterus
(3) Testes (4) Oviduct
7. Seminogelin is secreted by :
(1) Epididymis (2) Seminal Vesicle
(3) Thecal cells (4) Oviduct
8. First cleavage in frog is :
(1) Horizontal (2) Meridional
(3) Equatorial (4) Latitudinal

9. Which of the following is nuclear receptor ?
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|--------|----------|
| (1) AR | (2) GPCR |
| (3) IR | (4) MT1 |
10. Cryptorchidism is related to :
- | | |
|------------|--------------|
| (1) Testes | (2) Thyroid |
| (3) Ovary | (4) Pancreas |
11. Vision of cockroach is :
- | | |
|---------------|----------------|
| (1) Monocular | (2) Binocular |
| (3) Mosaic | (4) Superposed |
12. Formation of platelets is known as :
- | | |
|------------------|--------------------|
| (1) Haemopoiesis | (2) Thrombopoiesis |
| (3) Haemolysis | (4) Haemodialysis |
13. Scanning electron microscope is important for its image which are :
- | | |
|----------------------------|-----------------------|
| (1) Very large sharp image | (2) Three-dimensional |
| (3) Fluorescent | (4) Two-dimensional |
14. A dominant trait is expressed in :
- (1) Homozygous state only
 - (2) Heterozygous state only
 - (3) Neither homozygous nor heterozygous states
 - (4) Both homozygous and heterozygous states
15. Chromatid is :
- | | |
|----------------------------|--------------------------|
| (1) One half of chromosome | (2) Haploid chromosome |
| (3) Complete chromosome | (4) Duplicate chromosome |

16. A normal woman is married to a colour blind man. The children are expected to be :
- (1) All normal
 - (2) 50% sons are colour blind
 - (3) All daughters are normal but carrier whereas all sons are normal phenotypically as well genotypically
 - (4) 50% daughters are colour blind
17. Process of genetic mutation is :
- (1) Reversible
 - (2) Irreversible
 - (3) Partially reversible
 - (4) Continuous
18. Map distance of genes is calculated by :
- (1) Number of mutant genes
 - (2) Cross over percentage
 - (3) Non cross-over percentage
 - (4) Recombination frequency of each gene locus
19. Philadelphia chromosome occurs in patients suffering from :
- (1) Leukemia
 - (2) Rickets
 - (3) Hepatitis
 - (4) Albinism
20. Person with Klinefelter's syndrome have chromosome :
- (1) XX
 - (2) XY
 - (3) XXY
 - (4) XYY
21. The microtubules attached to the kinetochore are polymers of
- (1) Tubulin molecules
 - (2) Actin molecules
 - (3) Myosin molecules
 - (4) Centrin molecules

22. Mutations are :

- (1) Caused by genetic recombination
- (2) Heritable changes in genetic information
- (3) Caused by faulty transcription of the genetic code
- (4) Usually but not always, beneficial to the development of the individuals in which they occur

23. Trisomy of human chromosome 18 results in :

- | | |
|---------------------|---------------------|
| (1) Turner syndrome | (2) Down syndrome |
| (3) Patau syndrome | (4) Edward syndrome |

24. Chromatids joined together by a centromere are called :

- | | |
|-----------------------|---------------|
| (1) Sister chromatids | (2) Homologs |
| (3) Alleles | (4) Bivalents |

25. Mitosis and meiosis always differ in regard to the presence of :

- | | |
|----------------|-----------------|
| (1) Chromatids | (2) Spindles |
| (3) Bivalents | (4) Centromeres |

26. All of the following events happen in prophase I of meiosis, except :

- | | |
|-----------------------------|---------------------------|
| (1) Chromosome condensation | (2) Pairing of homologues |
| (3) Chiasma formation | (4) Segregation |

27. An XXY individual with Klinefelter syndrome would be expected to have how many Barr bodies in the majority of cells ?

- | | |
|-----------|------------------|
| (1) One | (2) Two |
| (3) Three | (4) No Barr body |

28. Plasmids are :

- (1) Small circular DNA molecules that are free in the cytosol
- (2) Small linear DNA molecules that are free in the cytosol
- (3) Small circular DNA molecules that remain incorporated in the genomic DNA
- (4) Large linear RNA molecules that are free in the cytosol

29. The length of DNA wrapped around a nucleosome core is :

- (1) 146 base pairs
- (2) 200 base pairs
- (3) 203 base pairs
- (4) 20 to 100 base pairs

30. In a karyotype the chromosomes are ordered by :

- (1) Size of the chromosomes
- (2) Size of the chromosomes and position of the centromere
- (3) Position of the centromere and long arm to short arm ratio
- (4) Size of the chromosomes and long arm to short arm ratio

31. Aneuploidy is defined as :

- (1) Any deviation from the complete chromosome complement
- (2) Only the loss of one set of chromosomes complement
- (3) Only gain of a full set chromosome complement
- (4) Only loss or gain of one chromosome

32. Operon occur in :

- (1) Only prokaryotes
- (2) Primarily in prokaryotes and in some eukaryotes including nematodes
- (3) All prokaryotes and all eukaryotes
- (4) Primarily in eukaryotes and also in many prokaryotes

33. Allelic heterogeneity is :

- (1) The existence of many different mutations, but all in the same gene, in unrelated people with same phenotype
- (2) The existence of many different mutations, but all in the different genes, in unrelated people with same phenotype
- (3) The existence of a single mutation, in different unrelated people with different phenotype
- (4) Combined effect of many different mutations, but all in different genes, for a phenotype in an individual

34. The back cross is :

- (1) A cross between F1 individual and F2 individual
- (2) A cross between an F1 individual with another F1 individual
- (3) Cross between F1 and one of the two parents
- (4) Cross between F2 with one of the parents

35. A haploid set of all the genes present in a gamete is called :

- | | |
|--------------|-------------------|
| (1) Genotype | (2) Phenotype |
| (3) Genome | (4) Linkage group |

36. Crossing over occurs during :

- | | |
|----------------|---------------|
| (1) Pachytene | (2) Diplotene |
| (3) Diakinesis | (4) Leptotene |

37. Which one can reverse the harmful effect of previous mutation ?

- | | |
|-------------------------|--------------------------|
| (1) Intergenic mutation | (2) Intragenic mutation |
| (3) Suppressor mutation | (4) Indirect suppression |

38. Map distance of genes is calculated by :

- (1) Number of mutant genes
- (2) Cross over percentage
- (3) Non cross-over percentage
- (4) Recombination frequency of each gene locus

- 39.** Crossing over in diploid organism is responsible for
- (1) Dominance of genes
 - (2) Segregation of alleles
 - (3) Recombination of linked genes
 - (4) Linkage between genes
- 40.** Positional cloning refers to :
- (1) Using a selection procedure to clone a cDNA
 - (2) Cloning a portion of a gene using PCR
 - (3) Isolating a gene by PCR using primers from another species
 - (4) Mapping a gene to a chromosomal region and then identifying and cloning a genomic copy of the gene from the region

Short Answer Questions

Note: 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.

- 01.** What is pedigree ? Why it becomes an important tool in human genetic studies ? 16
- 02.** Write notes on human genome project. 16
- 03.** Describe the method of fluorescence in situ hybridization (FISH) and its application in clinical cytogenetics. 16
- 04.** Write the principle of the following techniques and give their application in diagnosis of genetic disorders 8×2=16
- (a) Multiplex - PCR
- (b) PCR - RFLP
- 05.** Write notes on Transcriptomes and their use in disease diagnosis
- 06.** Give a brief account of the following : 8×2=16
- (a) Preimplantation diagnosis
- (b) What are invasive methods of prenatal diagnosis ?
- 07.** Write notes on : 8×2=16
- (a) Antigen-Antibody interaction
- (b) Western Blotting

- 08.** Answer the following : 8×2=16
- (a) Draw a diagram and label different basic components of a vector used in recombinant DNA technology.
 - (b) How is a cloning vector different from an expression vector ?
- 09.** Describe the method of human lymphocyte culture for chromosome preparation, explain the role of fetal calf serum and phytohemagglutinin in the cultures. 16
- 10.** Write short note on Pharmacogenomics. 16