Roll Number -
Topic - Principle of inheritance and variations, Molecular Basis of Inheritance
Marks -
Name -

1. Which of the following is a purine?
1) Cytosine
2) Uracil
3) Thymine
4) Adenine
2. Which type of bond is present between nitrogenous base and pentose sugar?
1) Phosphodiester bond
2) N - glycosidic linkage
3) Coordination linkage
4) Hydrogen bond
3.Which type of bond is present between nucleoside and -OH group?
1) Coordination linkage
2) N - glycosidic linkage
3) Phospho-ester linkage
4) Hydrogen bond
4. 5 - methyl uracil is also known as
1) Thymine
2) Uracil
3) Adenine
4) Guanine
5. A nucleoside differs from a nucleotide in not having a
1) Phosphate
2) Sugar
3) Phosphate & sugar
4) Nitrogen base
6. If DNA of a particular species was analyzed and it was found that it contains 27 percent A, what would be the percentage of C?
1) 27 percent
2) 30 percent
3) 23 percent
4) 54 percent
7. Which of the following correctly describes chromatin?
1) The complex of DNA and protein from which chromosomes are composed.
2) The total genetic content of a cell.
3) The proteins that give structural support to a chromosome.
4) Unpacked DNA
8. In RNA, the addition OH' group is present at of the ribose.
1) 5' position
3) 3' position
2) 2' position
4) 1' position
9. Where is the promoter located in relation to the structual gene in a transcription unit?
1) Towards the 3' -end (downstream)
2) Towards the 5' -end (upstream)
3) Within the structural gene itself
4) In the middle of the transcription unit
10. If the sequence of bases in coding strand of DNA is ATTCGATG, then the sequence of bases in mRNA will be
1) TAAGCTAC . 2) UAAGCUAC

3) ATTCGATG . **4) AUUCGAUG**

11. What are introns in terms of gene structure?
1) Segments of DNA that code for RNA
2) Segments of DNA that appear in mature or processed RNA
3) Promoter regions of structural genes
4) Segments of DNA that do not appear in mature or processed RNA

12. Which RNA carries the amino acids from the amino acid pool to mRNA during protein synthesis?
1) rRNA
2) mRNA
3) tRNA
4) hnRNA

13. UTRs are the untranslated regions present on
1) IRNA
2) tRNA
3) mRNA
4) nRNA

14. Which eukaryotic RNA polymerase transcribes tRNA?
1) RNA polymerase I
2) RNA polymerase II
3) RNA polymerase III
4) Any of these

15. What is the difference between monocistronic and polycistronic structural genes?
1) Monocistronic genes have interrupted coding sequences, while polycistronic genes do not.
2) Monocistronic genes are found in eukaryotes, while polycistronic genes are found in bacteria.
3) Monocistronic genes code for a single polypeptide, while polycistronic genes code for multiple polypeptides.
4) Monocistronic genes contain exons, while polycistronic genes contain introns.

16. What is the function of the terminator in transcription?
1) To define the template and coding strands
2) To provide a binding site for RNA polymerase
3) To regulate gene expression
4) To mark the end of the transcription process

17. In eukaryotes RNA polymerase-I transcribes
1) tRNA, 5S RNA and Sn RNA'S
2) r RNAs(28 S, 18S and 5.8S)
3) Heterogenous nuclear RNA (hn RNA)
4) All them

18. In lac operon model, lactose function as:
1) Inducer that binds to repressor protein
2) Repressor that binds to operator gene
3) Inducer that binds to operator gene
4) Co-repressor that binds to repressor protein

19. In lac operon system, gene - z codes for:
1) B-galactosidase
2) Repressor
3) Promoter
4) Inducer

20. Lac operon consists of:
1) One regulatory gene and three structural genes
2) Two regulatory genes and two structural genes
3) Three regulatory genes and three structural genes
4) Four regulatory genes only

21. HGP is closely associated with which branch of biology?
1) Bioinformatics
2) Biotechnology
3) Bioethical
4) Botany

22. The commonly used vector in human genome project was
1) Plasmid

2) Phagemid
3) Bacteriophage
4) Yeast artificial chromosome
23. The commonly used hosts in HGP were
1) Bacteria and yeast
2) Bacteria and fungi
3) Protozoa and bacteria
4) Plants and fungi

24. Sequencing the whole set of genome that contained all the coding and non-coding sequence and later assigning different region in the sequence with functions are referred to as
1) Expressed Tags.
3) ESTs
2) Sequence Annotation
4) SNPs
25. Following are the statements about replication process.
(a) DNA-dependent DNA polymerases catalyse polymerisation only in one direction.
(b) During replication, on one strand of DNA (the template with polarity 3' → 5'), the replication is discontinuous.
(c) The discontinuously synthesised fragments are later joined by the enzyme DNA ligase.
(d) DNA polymerases on their own cannot initiate the process of replication.
Choose the correct statements from the options given below.
1) (a) only
2) (a) and (c)
3) (a), (c) and (d)
4) (b) and (d)
26. How many statements are correct?
a) The process of copying genetic information from one strand of the DNA into RNA is termed as transcription.
b) The DNA-dependent RNA polymerase catalyse the polymerisation in only one direction.
c) The promoter is said to be located towards 5' -end (upstream) of the structural gene.
d) The terminator is located towards 3' -end (downstream) of the coding strand.
1) One
3) Two
2) Three
4) Four
27. Which one is not a dominant trait amongst seven pea traits chosen by Mendel?
1) Flower Colour-Violet
2) Pod Colour-Yellow
3) Shape of Seed-Round
4) Flower-Axial
28. Genetics deals with
1**) Heredity and variations**
2) Mutations
3) Variations
4) Mendel's laws
29. According to Sutton and Boveri, what leads to the segregation of a pair of factors carried by chromosomes?
1) Genetic modification
2) Natural selection
3) Pairing and separation of chromosomes
4) Environmental factors
30. Which term best describes the absence of the dwarf trait in the F, progeny of Mendel's experiment?
1) Incomplete dominance
2) Co-dominance
3) Recessive trait
4) Dominant trait
31. Hybrid of pure red flowered and white flowered pea is crossed to pure red flowered plant. The progeny shall be:

1) Red flowered
2) White flowered
3) Both red and white flowered plants
4) Mostly red flowered plants
32. When both alleles express their effect on being present together, the phenomenon is called:
1) Dominance
2) Incomplete dominance
3) Pseudo dominance
4) Co-dominance
33. An unfertilised egg in honeybees develops as a drone by means of
1) Parthenogenesis
2) Meiosis
3) Mitosis .
4) Apogamy
34. Male heterogamy is shown by
1) Grasshopper
2) Human being
3) Drosophila
4) Both (2) & (3)
35. In insects with the XO type of sex determination, what is the genetic makeup of females?
1) XX
2) XY
3) XO
4) XXY
36. Point mutation involves
1) Deletion
2) Insertion
3) Duplication
4**) Change in single base pair**
37. Loss or gain of a chromosome results in
1) Aneuploidy
2) Point mutation
3) Polyploidy
4) Linkage
38. Chromosomal aberrations are commonly observed in which type of cells?
1) Somatic cells
3) Cancer cells
2) Epithelial cells
4) Cork cells
39. A mutation is a
1) Sudden temporary change in an organism's genetic material.
2) Change in phenotype followed by a chge in genotype.
3) Change in hereditary material directed by a changing environment
4) Change in genotype which may result in a new expression of a characteristic.
40. 'Gametes are never hybrid'. This statement is a law of
1) Dominance
2) Independent assortment
3) Segregation
4) Random fertilization

Directions: These questions consist of two statements each, printed as Assertion and Reason. While answering these questions, you are required to choose any one of the following four responses.
1) Assertion and Reason are True and the Reason is a correct explanation of the Assertion.
2) Assertion and Reason are True but Reason is not a correct explanation of the Assertion.
3) Assertion is True but the Reason is False.
4) Assertion is False but the Reason is True. 1,2,2,3,2

41. **Assertion:** Two DNA strands are antiparallel.
Reason: The phosphodiester bonds in one strand of DNA go from 3'→5' just reverse in other strand.

42. **Assertion:** RNA polymerase binds to promoter and initiates the process of transcription.
Reason: The RNA polymerase is only capable of catalysing the process of elongation.

43. **Assertion: Drosophila could be grown on a simple synthetic** medium in the laboratory.
Reason: Drosophila complete their life cycle in about two weeks and a single mating could produce a large number of progeny flies.

44.**Assertion**: Honey bee do not have father and thus cannot have sons.
Reason: Male in honey bee produces sperms by meiosis.

45. **Assertion:** In a pedigree analysis, represents five unaffected offsprings.
Reason: In a pedigree analysis, the offsprings are numbered with arabic numerals (1, 2, 3....) and a generation is numbered with roman numerals (I, II, I...).