

1. Find out the base sequence on RNA which is made from the following DNA molecule

$$\begin{array}{c} 3' \overline{\text{GCTAACGATC}} 5' \\ 5' \overline{\text{CGATTGCTAG}} 3' \end{array}$$
 1. 5' G C U A A C G A U C 3'
 2. 5' C G A U U G C U A G 3'
 3. 3' C G A U U G C A A G 5'
 4. 3' G C U A A C G A U G 5'
2. Which one of the following is incorrect w.r.t. lac operon?
 1. It is inducible operon which controls anabolic pathway
 2. Glucose or galactose cannot act as inducer
 3. The repressor is synthesised constitutively from the i-gene
 4. Repressor is active which binds to the operator region
3. At how many locations, SNPs are present in human beings?
 1. 1.4 billion
 2. 1.4 million
 3. 3×10^9 bp
 4. 3×10^4 bp
4. Which one of the following steps comes after electrophoresis in DNA finger printing?
 1. Use of restriction endonuclease
 2. Isolation of DNA
 3. Southern blotting
 4. DNA - RNA hybridization
5. If the sequence of nucleotides is AUG UUU UGC UAC, the sequence of amino acids will be Met-Phe-Cys-Tyr. Likewise, if the sequence of amino acids is Met-Tyr-Cys-Phe, then the sequence of nucleotides will be
 1. AUG UAC UGC UUU
 2. AUG UAU UGU UUC
 3. AUG UAC UGU UUU
 4. Any one of the above three
6. Energetically DNA replication is a very expensive process. The energy during the polymerisation of new strand is provided by
 1. GDP
 2. ADP
 3. Deoxyribonucleoside triphosphates
 4. Ribonucleoside triphosphates
7. In HGP, the fragments of DNA were sequenced using automated DNA sequencers. It worked on the principle of a method developed by
 1. E.M. Southern
 2. Frederick Sanger
 3. Craig Venter
 4. Wellcome Trust (U.K.)
8. Which of the following group of RNA is not synthesised by RNA polymerase-I in eukaryotes?
 1. 5.8 S rRNA and 18 S rRNA
 2. 18 S rRNA and 28 S rRNA
 3. 5.8 S rRNA and 5 S rRNA
 4. 5 S rRNA and Sn RNA

9.

Which of the following is not correct w.r.t. DNA replication?

1. Eukaryotes have several thousand origins of replication
2. Unwinding is brought about by enzyme helicase, which is ATP dependent
3. DNA synthesis occurs in 3'→5' direction
4. DNA polymerase-I removes RNA primer and replace it with the nucleotide of DNA and can correct the T=T dimer.

10.

Which of the following is not a codon of glycine?

1. GGC
2. GCG
3. GGU
4. GGA

11.

Choose the wrong statement for template strand in DNA

1. It is called antisense and coding stand
2. It has 3' → 5' polarity
3. It is the strand upon which RNA is transcribed in 5' → 3' direction
4. Terminator region lies at its 5'-end

12.

Which of the given is not among the salient features of HGP?

1. Human genome contains about 316.7 bp
2. Average gene size is 3000 bases
3. Less than 2% of genome codes for proteins
4. Chromosome 1 has most genes i.e., 2968

13.

Select an incorrect statement w.r.t. lac operon

1. It consists of three structural genes
2. Every structural gene has its own promoter
3. Repressor protein is active
4. β -galactosidase catalyses breakdown of lactose

14.

RNA may not be a suitable genetic material in organisms because of

1. Presence of 2'-OH in sugar
2. Chemically less reactive nature
3. Structurally more stable nature
4. Slow rate of mutation

15.

Lac operon in E. coli

1. Is repressible
2. Consists of five structural genes
3. Can also act in presence of galactose
4. Remains switched off in absence of inducer

16.

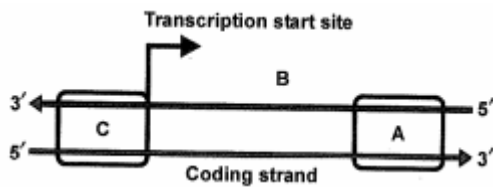
Select the incorrect match

1. $\phi \times 174$ — 5386 bp
2. λ phage — 48502 bp
3. E. coli — 4.6×10^5 bp
4. Haploid human cell — 3.3×10^9 bp

17. What is incorrect for DNA?
1. Radius of DNA is 1 nm
 2. Phosphate moiety is at 5'-end of deoxyribose sugar
 3. Nitrogen bases linked to sugar moiety project inward
 4. Distance between two successive base pair strands is 3.4 nm
18. Which of the following is not present in DNA?
1. Guanine
 2. Cytosine
 3. Thiamine
 4. Adenine
19. Histone proteins are rich in which set of amino acids?
1. Methionine and cysteine
 2. Lysine and arginine
 3. Tryptophan and tyrosine
 4. Proline and glycine
20. Who proposed semiconservative mode of replication in DNA?
1. Meselson and Stahl
 2. Watson and Crick
 3. Calm
 4. Taylor
21. Transduction experiment to prove DNA as a genetic material was conducted by Hershey and Chase with the use of radioactive elements, namely
1. S³² and P³⁵
 2. S³⁵ and P³²
 3. N¹⁵ and H³
 4. C¹⁴ and H³
22. UTRs are required for efficient translation, which are present on
1. 3' mRNA
 2. 5' mRNA
 3. T ψ C region of tRNA
 4. Both (1) & (2)
23. Find the incorrect statement w.r.t. lac operon
1. It has a negative control with respect to repressor
 2. It is a inducible operon
 3. It is a group of six genes working in a coordinated manner
 4. lac-y gene codes for β -galactosidase
24. How many nucleotides are approximately connected with one nucleosome in DNA?
1. 50
 2. 100
 3. 150
 4. 200

25. During early years of HGP, _____ became the major partner of the project
1. U.S. department of energy
 2. National institute of health
 3. Wellcome trust, U.K.
 4. NBPGR
26. VNTR belongs to a class of satellite DNA and its size in a genome varies from 0.1 to ____
1. 20 kb
 2. 30 kb
 3. 40 kb
 4. 50 kb
27. During DNA finger printing experiment DNA bands of different sizes gives a characteristic pattern for an individual, called as
1. Dendrograph
 2. Autoradiogram
 3. Cladogram
 4. Phenogram
28. DNA polymorphism is equivalent to allelic sequence variation and
- a. These are inheritable
 - b. These can be observed in non coding DNA
 - c. Satellite DNA is an example for such variations
1. All are correct
 2. Only c is correct
 3. Both a and c are incorrect
 4. Only b is incorrect
29. A model organism of plant category which has also been sequenced along with rice is
1. Agropyron
 2. Anabaena
 3. Agrotis
 4. Arabidopsis
30. RNA synthesis stops as soon as polymerase reaches the terminator region. Which is required for this proces?
1. F-factor
 2. Nus-factor
 3. Rho factor
 4. Sigma factor
31. Which one of the following is incorrectly matched pair w.r.t. DNA fingerprinting?
1. Size separation - Gel electrophoresis
 2. VNTRs from Gel to Nylon paper - Blotting technique
 3. Microsatellites - ESTs
 4. RFLP amplification - PCR
32. Prokaryotic mRNA begins translation even during its synthesis and its nature is
1. Monocistronic
 2. Polycistronic
 3. hnRNA
 4. Monogenic

33. The unequivocal proof that DNA is the genetic material came from the experiment which utilised
1. Streptococcus
 2. T₂, E. coli
 3. E. coli, heavy nitrogen
 4. P³², S³⁵, R-type bacteria
34. Protein synthesising machinery has evolved around _____ and _____ is best for the transmission of genetic information.
1. DNA, RNA
 2. RNA, DNA
 3. RNA, RNA
 4. DNA, DNA
35. Choose the odd one out w.r.t. Taylor's experiment
1. Used roots of Vicia faba
 2. Utilised radioactive thymidine
 3. Used heavy nitrogen
 4. Proved DNA in chromosomes replicate semi-conservatively
36. For which of the following features the DNA polymerases and RNA polymerases are similar?
1. Can perform the proof reading
 2. Cannot initiate the nucleotide polymerisation
 3. Shows polymerisation in 5'→3' direction
 4. More than one option is correct
37. Choose the incorrect option w.r.t. transcription unit
1. Regulatory sequences may be present at both upstream and downstream of the promoter region
 2. Promoter is present at the 5' end of the structural gene
 3. DNA strand which does not code for anything is called non-coding strand
 4. Termination sequence is present at 3' end of the coding strand
38. How many adenylate residues are added at 3' end during the processing of hn RNA in eukaryotes?
1. 50-100
 2. 100-150
 3. 600-700
 4. 200-300
39. In prokaryotes the two charged tRNA's are brought close together in ribosome then the formation of peptide bond between them is performed by the catalyst
1. 16S rRNA
 2. 23S rRNA
 3. 18S rRNA
 4. 28S rRNA
40. Frederick Sanger has developed an automated DNA sequencing that arranged the DNA fragments on the basis of
1. Satellite DNA
 2. Overlapping regions
 3. Repetitive DNA
 4. ESTs

41. Number of genes associated with chromosome 1 in human beings is
1. 231
 2. 30000
 3. 2968
 4. 3000
42. An mRNA synthesized by using 144 nucleotides is capable of producing a polypeptide chain of
1. 48 amino acids
 2. 47 amino acids
 3. 282 amino acids
 4. 141 amino acids
43. In an inducible operon system, the permeability for lactose absorption is increased by an enzyme. This enzyme is a product of _____ gene.
1. lac z
 2. lac y
 3. lac a
 4. trp b
44. Predominant site for the control of gene expression in prokaryotes is
1. Transcriptional level
 2. Processing level
 3. mRNA transport level
 4. Translational level
45. In a eukaryotic cell splicing, capping and tailing steps
1. Are template dependent
 2. Occur in cytoplasm
 3. Occur in nucleus
 4. Are performed by SnRNPs
46. In the given below transcription unit, what does A, B and C represent respectively?
- 
1. Terminator, Non-template, Promoter
 2. Promoter, Non-coding, Terminator
 3. Promoter, Template, Structural gene
 4. Terminator, Template, Promoter
47. A = T, G ≡ C pairing is present in DNA. This base pairing confers very unique property to the polynucleotide chains and they are said to be complementary to each other. From this we can deduce all the following, except
1. The quantity of A is equal to the quantity of T
 2. $G/C = 1$
 3. The quantity of A + T is equal to the quantity of G + C
 4. If the sequence of bases in one strand is known then the sequence in other strand can be predicted

48.

During replication, DNA synthesis occurs discontinuously on one strand because

1. DNA molecule uncoils gradually
2. Hydrogen bonds keep the two strands together
3. Topoisomerase and helicase can act only on one side of DNA molecule
4. DNA polymerase can polymerise the nucleotides in only on direction

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49.

Process of translation of the mRNA to protein begins when

1. Small subunit of ribosome encounters with mRNA
2. Aminoacylation of tRNA occurs
3. Amino acid activation occurs
4. Charged tRNA sequentially binds to the appropriate codon in mRNA

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50.

Select the correct statements from the following regarding transcription.

- A. In transcription only a segments of DNA and only one of the strands is copied into RNA.
- B. Terminator is located at upstream of the structural gene.
- C. Intervening sequences do appear in processed RNA.
- D. In bacteria translation can begin much before the mRNA is fully transcribed.

1. A & D
2. B & C
3. A & C
4. B & D