

**Q/ Correct the underlined words in the following statements:**

1. Primers for RNA polymerase II consist of three regions, the initiator box, the TATA box and a variety of upstream elements.
2. The nucleotide pair in the DNA double helix that corresponds to the site from which the first 5' mRNA nucleotide is transcribed is called the initiation site.
3. In Griffith's Experiment, non-encapsulated strains produced straight colonies.
4. The pattern of replication in *E. coli* is dispersive.
5. Segment of DNA (or RNA) that encodes a single polypeptide chain is called exon.
6. The strand of DNA equivalent in sequence to the messenger RNA is called template strand.
7. In *E. coli*, DNA is made at nearly 10,000 nucleotides per second.
8. Region where DNA double helix is temporarily opened up so allowing transcription to occur is replication bubble.
9. The -35 sequence, TTGGAA, is recognized and bound by σ during prokaryotic transcription.
10. Another name for the -10 region of the bacterial promoter is TATA box.

Q/ Write about the following (answer 6 only):

1. Alternative forms of the DNA double helix (table).
2. Capping of mRNA.
3. Differences between Prokaryotic and Eukaryotic transcription (table).
4. Monocistronic and polycistronic mRNA.
5. Proteins involved in DNA synthesis (count only).
6. Chargaff's rules.
7. Histone-like proteins that involve in DNA compaction and genome organization in *E. coli*.

Q/ Fill in the blanks with appropriate words:

1. In eukaryotes, RNA molecule produced by transcription before it has been processed in any way is known as _____.
2. _____ of DNA means increasing the UV absorption that occurs when the DNA duplex is denatured.
3. A new class of genes, MicroRNAs, has recently been discovered and appears to regulate at least _____ of all proteins within the human proteome.
4. Most _____ bind DNA in the major groove.
5. A double-stranded DNA molecule thus has a hydrophobic core composed of _____.
6. The DNA synthesized on the lagging strand as short fragments (_____ nucleotides) is called the Okazaki fragments.
7. _____ are highly repetitive sequences, generally not transcribed and are present in 1 to 10 million copies per haploid genome.
8. Watson–Crick base pairing allows the 1'-carbons on the two strands to be exactly the same distance apart (_____ nm).
9. _____ is a stretch of multiple adenosine residues found at the 3'-end of mRNA.
10. _____ are the fundamental organization upon which the higher-order packing of chromatin is built.
11. Because _____ can occur only on a single-stranded DNA template, the double-stranded DNA first unwind.
12. Hershey and Chase radioactively labeled phage DNA with _____.
13. In cell nuclei, DNA and protein complexes known as chromatin make up the _____.
14. _____ is a type of satellite DNA.
15. Prokaryotic transcription elongation begins with the release of the _____ from the polymerase.

Q/ Define the following (answer 5 only):

1. Central dogma
2. Bi-directional replication
3. 3'-UTR
4. Splicing
5. Cap
6. RNA polymerase III

Q/ Write about the following (answer 5 only):

1. Eukaryotic nuclear RNAs (table)
2. Addition of Poly (A) Tail to Eukaryotic mRNA
3. Why the double-stranded DNA first unwind during replication?
4. Proteins involved in DNA synthesis
5. Types of RNA (count only)
6. Why RNA processing is characteristic of eukaryotic mRNA?

Q/ Fill in the blanks with appropriate words:

1. Hyperchromic effect of DNA means increasing the _____ that occurs when the DNA duplex is denatured.
2. A new class of genes, MicroRNAs, has recently been discovered and appears to regulate at least 30% of all proteins within the human _____.
3. Most transcription factors bind DNA in the _____.
4. A double-stranded DNA molecule thus has a _____ composed of stacked bases.
5. The DNA synthesized on the lagging strand as short fragments (100 to 200_nucleotides) is called the _____.
6. Satellite DNA are _____.
7. Watson–Crick base pairing allows the _____ on the two strands to be exactly the same distance apart (1.08 nm).

8. _____ is a stretch of multiple adenosine residues found at the 3'-end of mRNA.
9. Nucleosomes are the fundamental organization upon which the higher-order packing of _____ is built.
10. Hershey and Chase radioactively labeled _____ with phosphorus-32.
11. In _____, DNA and protein complexes known as chromatin make up the chromosomes.
12. _____ contains 12 bases per turn.
13. Prokaryotic transcription _____ begins with the release of the σ subunit from the polymerase.
14. All nucleic acids, whether DNA or RNA, are synthesized in the _____ direction.
15. Segment of DNA (or RNA) that encodes a _____ is called exon.

Q/ Define the following (answer 5 only):

1. Enhancer
2. Initiator box
3. Upstream element
4. TBP
5. Rho-dependent termination
6. Core enzyme

Good Luck

Lecturer

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