**General concepts：**

RNA is a polymer composed of alternating units of ribonucleotides connected through a 3’-5’phosphodiesterbond.

**rRNA** -Ribosome -contains enzymes and keeps everything together，the RNA structural component of the ribosome

**tRNA** -Transfer RNA carries amino acid and read codonson m-RNA through its own anticodons.assists in decoding the information contained within mRNA duringtranslation by recruiting the correct amino acid to the growing peptide chain

**mRNA** the RNA that transfers genetic information stored in DNA into a

form useable for protein synthesis

**General mechanism of RNA synthesis**

①elongation by addition of ribonucleotides to the 3’-OH end

②3’-OH acts as a nucleophile, attacking the a-phosphate of the incoming ribonucleoside triphosphate and releasing pyrophosphate

③mechanism is the same as that used for elongation of a DNA strand

**Function of 5´cap**

• Protection from degradation

• Increased translational efficiency

• Transport to cytoplasm

• Splicing of first intron

**Function of poly(A) tail**

• Increased mRNA stability

• Increased translational efficiency

• Splicing of last intron

**1. Why is transcription necessary?**

Transcription makes messenger RNA (mRNA) to carry the code for proteins out of the nucleus to the ribosomesin the cytoplasm.

**2. Describe transcription.**

RNA polymerase binds to DNA, separates the strands, then uses one strand as a template to assemble mRNA.

**5. What are the main differences between DNA and RNA.**

DNA has deoxyribose, RNA has ribose; DNA has 2 strands, RNA has one strand; DNA has thymine, RNA has uracil.

**What is different between the DNA replication and RNA transcription ?**

Transcription is very similar to DNA replication but there are some important differences:

1.RNA is made of ribonucleotides

2.RNA polymerase catalyzes the reaction

3. The synthesized RNA does not remain base-paired to the template DNA strand

4. Less accurate (error rate: 10-4)

5.Transcription selectively copies only certain parts of the genome and makes one to several hundred, or even thousand, copies of any given section of the genome.