Register Number.....

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B.TECH. DEGREE EXAMINATIONS: APRIL/MAY 2009

Fourth Semester

BIOTECHNOLOGY

U07BT405 Molecular Biology

its

Time: Three Hours **Maximum Marks: 100**

Answer ALL the Questions:-

PART A (20 x 1 = 20 Marks)

1. Mendelian experiments were successful because
   a) His choice of peas as model plant b) his choice of contrast characters
   c) he was an expert d) He grew the plants himself

2. The process of DNA transfer from virus to bacteria is
   a) conjugation b) transduction c) transformation d) transfection

3. The unit of genetic distance is
   a) Kilo base b) Kilo Dalton c) Centi Morgan d) Centimetre

4. Which of the following molecules functions to tranfer information from the nucleus to cytosol
   a) DNA b) mRNA c) tRNA d) lipids

5. A lagging strand is
   a) the one which grows along the fork b) grows opposite to the fork
   c) Which grows in either orientation d) Does not grow

6. Coding strand is
   a) same as mRNA b) template for mRNA
   c) complementary to mRNA d) always the top strand

7. Reverse transcriptase catalyzes
   a) Polymerization of DNA to RNA b) Polymerization of RNA to DNA
   c) Polymerization and exonuclease activity d) polymerization and proof reading

8. Choose the odd one out
   a) Holliday model b) Measelson –Radding model
   c) Double strand break model d) Markov model

9. A double stranded DNA has 30%Thyamine, the % of Cytosine is
   a) 30% b) 20% c) 70% d) 15%

10. Which of the following feature of transcription is similar to replication
    a) No primer needed for polymerization
    b) Polymerization does not have proof reading
    c) newly synthezised strand falls off even before complete transcription
    d) Topoisomerase action

11. Which one of the following is not a requirement to amplify DNA in a PCR
    a) DNA template b) Taq polymerase c) NTPs d) Mg Cl2

12. Gel shift assays are routinely performed to monitor the interaction between
    a) Proteins b) Nucleic Acids c) Proteins and Nucleic acids d) Drug and proteins

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13. Unique codons are
a) Met and Ala b) Pro and Met c) Met and Trp d) Trp and His

14. Universal genetic code represents
a) All 64 codons
b) Codons used by all organisms
c) Codons used by Ciliates and mitochondria
d) Codons used by organisms other than Ciliates and mitochondria

15. 23S and 26S are
a) rRNA sizes of pro and Eukaryotes b) ribosomal sizes
c) Sedimentation values for ribosomes d) tRNA sizes

16. The functional feature of a genetic code which allows the expression of a protein in any host is its
a) triplet nature b) Degeneracy c) Universality d) redundancy

17. Mutation can not be created by
a) addition b) deletion c) polymerization d) translocation

18. Lac operon contains the following genes
a) Z, Y, A b) E,D,C,B,A c) B, A, D, d) X, Y, Z

19. Rolling circle results in
a) multimering single strand DNA b) Circular plasmid DNA
c) Replication of Phages d) Okazaki fragments

20. Regulation of gene expression by Attennuation is explained in the
a) Lac operon b) Arabinose operon c) Trp operon d) Gal operon

PART B (5 x 16 = 80 Marks)

21.a. (i) What is crossing over? Explain it with the stages of cell division (8)

(ii) Which classical experiment leads to the identification of DNA as the genetic material? (8)

(OR)

21.b. (i) What is Cot curve/value explain its significance? (8)

(ii) How Eukaryotic DNA is packed in to chromosomes? (8)

22.a. (i) Draw a schematic of repliosome and outline the features and steps involved in DNA replication. (8)

(ii) What are the various forms of DNA elaborate on their structural features and prevalence? (8)

(OR)

22.b. (i) Differentiate a promoter and an enhancer and explain the structure of a prokaryotic promoter with a schematic. (8)

(ii) Describe the various modes of replication of viral DNA (8)

23.a. (i) List the Eukaryotic transcription initiation factors and their function (8)

(ii) What is a spliceosome? How nuclear mRNA is spliced? (8)

(OR)

23.b. (i) What is a genetic code? Explain the experiment which led to the identification of triple letter genetic code (8)

(ii) What are tRNAs ? Write about their secondary and tertiary structure and function in translation. (8)

24.a. Elaborate on ribosome structure, function and the translation process. (16)

(OR)

24.b. Give a detailed account on Lac operon structure, function and regulation in bacterial systems. (16)

25.a. (i) Illustrate the lytic and lysogenic cycles of phages. (8)

(ii) Briefly explain the various methods of DNA repair in bacterial systems. (8)

(OR)

25.b. (i) Narrate how RNA secondary structure and Trp availability regulates the Trp operon. (8)

(ii) Differentiate the various types of mutations and their cause and repair (8)

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