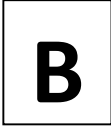


NAME: _____ ID NO: _____ TUTORIAL SECTION: _____



BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI-HYDERABAD CAMPUS

BIO F111 (GENERAL BIOLOGY)

FIRST SEMESTER (2022-23)

ANNOUNCED QUIZ-2 (CLOSED BOOK)

DATE: 27/12/2022

MARKS: 30

DURATION: 30 MINUTES

Instructions:

(1). Clearly encircle the most appropriate answer using a PEN.

(2). There are a total of 30 questions each carrying 1 marks (30X1=30marks).

(3). Please write your NAME, ID No. and TUTORIAL SECTION in bold letters.

1. A biologist finds that a particular mutation has no effect on the polypeptide encoded by the gene. This mutation probably involves

- (A). deletion of one nucleotide (B). alteration of the start codon
(C). insertion of one nucleotide (D). substitution of one nucleotide

2. In a plant cell, transcription occurs in the _____ and translation occurs in the _____.

- (A). nucleus; nucleus (B). cytoplasm; cytoplasm (C). nucleus; cytoplasm (D). cytoplasm; nucleus

3. Which of the following is false?

- (A). Virus can have RNA as genetic material (B). Viroids are small, circular RNA molecules
(C). Virus can reproduce on its own (D). Virus consists of nucleic acid wrapped in a protein coat

4. Creutzfeldt-Jakob disease, an extremely rare, incurable, and inevitably fatal deterioration of the brain occurs in humans due to infection with:

- (A). Viroids (B). Viruses (C). Prions (D). Bacteria

5. In a gel electrophoresis, the pattern of bands in the gel typically shows:

- (A). the order of bases in a particular gene
(B). the presence of various-sized fragments of DNA
(C). the order of genes along particular chromosomes
(D). the exact location of a specific gene in the genome

6. Typically, which combination of the following nitrogenous bases are NOT common to both DNA and RNA:

- (A). Adenine & uracil (B). Guanine & thymine (C). Thymine & uracil (D). Cytosine & Thymine

7. Which of the following correctly ranks nucleic acid structures in order of size, from largest to smallest?
- (A). gene, chromosome, nucleotide, codon
(B). chromosome, gene, codon, nucleotide
(C). nucleotide, chromosome, gene, codon
(D). chromosome, nucleotide, gene codon
8. Which of the following statements is incorrect?
- (A). In DNA nucleotides, nitrogenous base is not covalently linked to phosphate
(B). A nucleotide in DNA is made up of ribose sugar, a nitrogenous base and a phosphate
(C). DNA replication involves base-pairing principle
(D). DNA polymerases help in DNA repair
9. Which of the following components is involved in formation of peptide bond during translation step?
- (A). DNA polymerase (B). RNA polymerase (C). Lysosomes (D). Ribosomes
10. During translation, codon in _____ is recognised by _____ of _____.
- (A). tRNA; anticodon; mRNA (B). rRNA; anticodon; tRNA
(C). mRNA; anticodon; tRNA (D). rRNA; anticodon; mRNA
11. In humans, the total number of chromatids in a daughter cell formed after completion of Meiosis 1 is _____.
- (A). 23 (B). 46 (C). 92 (D). 0
12. Due to the phenomena of independent assortment of chromosomes, for a human ($n=23$) there will be _____ possible chromosome combinations.
- (A). 2^{23} (B). 23^2 (C). 46^2 (D). 2^{46}
13. Prophase-1 of meiosis is different from prophase of mitosis with respect to
- (A). Crossing over and synapsis of chromosomes (B). Absence of spindle
(C). Having 92 chromatids (D). Breakdown of nuclear envelope
14. Which of the following is not a function of mitosis in humans?
- (A). repair of wounds (B). growth
(C). production of gametes from diploid cells (D). replacement of lost or damaged cells
15. A nonsense mutation in a tumor-suppressor gene can
- (A). cause uncontrolled cell growth (B). cure cancer
(C). inhibit cell division (D). Both B and C

16. Put the following steps of human gene therapy in the correct order.

- (i). recombinant virus is injected into patient
 - (ii). human gene is inserted into a virus
 - (iii). normal human gene is isolated & cloned
 - (iv). normal human gene is transcribed & translated in patient
- (A). i, ii, iv, iii (B). iii, ii, i, iv (C). iv, ii, i, iii (D). ii, i, iv, iii

17. Primers used in polymerase chain reaction (PCR) are

- (A). single-stranded DNA molecules
- (B). short sequences that are complementary to the nucleotides at the end of the DNA sequence to be amplified
- (C). Only B
- (D). Both A and B

18. The DNA polymerase used in polymerase chain reaction (PCR) is

- (A). required to join pieces of DNA (B). required for DNA denaturation
- (C). unusually heat-stable (D). Both B and C

19. A typical human somatic cell has _____ number of chromosomes in total, of which _____ are autosomes and _____ are sex chromosomes.

- (A). 2, 44, 46 (B). 23, 44, 46 (C). 46, 44, 2 (D). 2, 2, 23

20. Which of the following does not have $2n$ (diploid) number of chromosomes?

- (A). Zygote (B). Resting Human liver cell
- (C). Sperm cell (D). Cell in G1 phase of cell cycle

21. Which of the following is true for *lac* operon in the absence of lactose?

- (A). Repressor is not active (B). RNA polymerase cannot attach to the promoter
- (C). Genes for lactose enzymes are expressed (D). None of the above

22. A eukaryotic gene was inserted into the DNA of a bacterium. The bacterium then transcribed the gene into mRNA and translated the mRNA into protein. The protein produced was useless and had many more amino acids than the protein made by the eukaryotic cell. Why?

- (A). The mRNA was not spliced as it happens in eukaryotes
- (B). Eukaryotes and prokaryotes use different genetic code
- (C). Ribosomes were not able to bind to RNA
- (D). Repressor proteins interfered with transcription and translation

23. Which of the following is not a part of 'OPERON'?
- (A). Repressor (B). Operator (C). Promoter (D). Cluster of related genes
24. Which of the following statements is false about eukaryotes?
- (A). in eukaryotes, more than one polypeptide from a single gene can be made due to alternative RNA splicing
- (B). all eukaryotic genes are grouped into operons
- (C). in eukaryotes, repressor proteins bind to DNA sequences known as silencers
- (D). in eukaryotes, regulation of gene expression can also occur after translation
25. Your bone cells, muscle cells, and skin cells look different because
- (A). different kinds of genes are present in each kind of cell
- (B). different genes are active in each kind of cell
- (C). they are present in different organs
- (D). different mutations have occurred in each kind of cell
26. Which of the following cells would likely express the genes that code for glycolysis enzymes?
- (A). nerve cells (B). liver cells (C). pancreas cells (D). all of these cells
27. Reverse transcriptase is an enzyme that converts _____.
- (A). DNA to DNA (B). RNA to RNA (C). RNA to DNA (D). DNA to RNA
28. In mammals, embryonic stem cells are obtained by
- (A). Removing cells from late embryo (differentiated) and growing them in laboratory culture
- (B). Removing cells from adult skin and growing them in laboratory culture
- (C). Removing cells from early embryo and growing them in laboratory culture
- (D). All of the above
29. Which of the following events can drive transformation of a proto-oncogene into an oncogene?
- (A). Mutation within the gene
- (B). Gene moved to a new DNA position under new controls
- (C). Gene duplication event creating multiple copies of the gene
- (D). All of the above
30. Cancers take a long time to develop because:
- (A). it takes a long time for cells to grow and divide
- (B). young cells are not susceptible to DNA mutations
- (C). multiple DNA mutations must accumulate in the same cell for it to become cancerous
- (D). many generations of cancerous cells must occur before the DNA will mutate