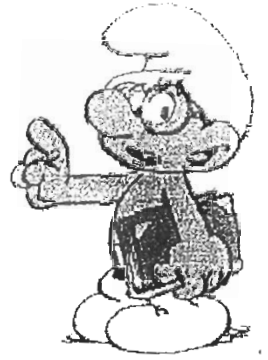


مركز البرود للنسخ السريع

طباعة كمبيوتر - تجليد فني - قرطاسية
(دار جليس الزمان للنشر والتوزيع)



Bio(101)

الامتحان العالي - النهائي

مع تمنياتنا لكم بالتوفيق والنجاح

{ } السعر

هاتف : 5343052



Bio (101)

بیولوجی - حصہ اول

المملكة الأردنية الهاشمية
1

University of Jordan
Dept. of Biological Sciences

General Biology (1)
Final Exam

Name: Diman Swais

Section:

Reg. No:

Instructor:

I- Multiple-Choice Questions: Choose the one best answer (1 point each).

1- The bonds that are broken when water vaporizes are:

- ~~A-~~ ionic bonds B- bonds between water molecules *H. Bonds*
~~C-~~ bonds between atoms of individual water molecules.
~~D-~~ polar covalent bonds. ~~E-~~ nonpolar covalent bonds

2- Which one of the following is not a contributing factor in water transport in plants?

- ~~A-~~ Cohesion of water molecules
~~B-~~ Adhesion of water molecules to the vessels
 C- Evaporation D- Molecular weight
~~E-~~ None of the above

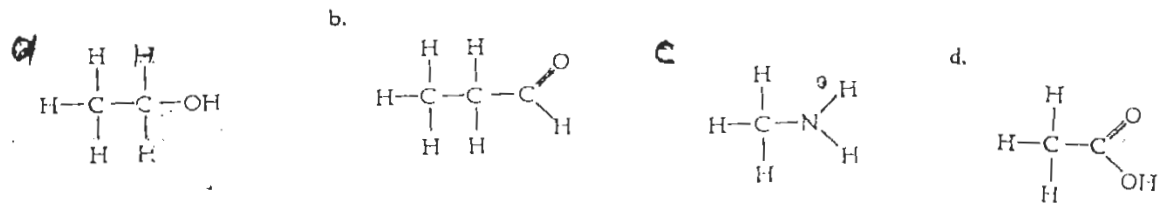
3- Water is less dense as a solid than as a liquid. The cause of this behavior is:

- ~~A-~~ surface tension ~~B-~~ evaporating cooling
~~C-~~ ionic bonding ~~D-~~ all of the above
 E- none of the above

4- In a lake contaminated by acid rain, fish generally die when the water is persistently below which pH?

- A- 8 B- 7 C- 6.5 D- 6 E- 5

Questions 5-6 refer to the molecules shown below



5- Which of these molecules contain(s) a carboxyl group?

- A- a B- b C- c D- d E- All of the above

6- Which of these molecules is water soluble?

- A- a B- b C- c D- d E- all of the above

7- Which of the following is true both of starch and of cellulose

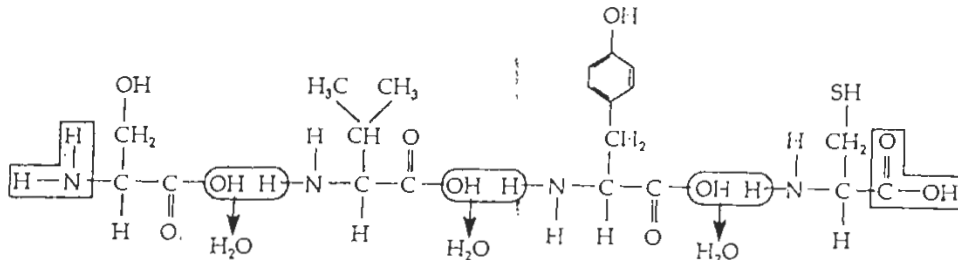
- A- They are both polymers of glucose
~~B-~~ They are geometric isomers of each other
~~C-~~ They can both be digested by human
~~D-~~ They are both used for energy storage in plants.
~~E-~~ They are both structural components of the plant cell wall.



8- Which of the following statements best summarizes structural differences between DNA and RNA?

- A- RNA is a protein while DNA is a nucleic acid
- B- DNA is not a polymer, but RNA is
- C- DNA contains a different sugar than RNA
- D- Both DNA and RNA are found as double helices in nature
- E- DNA has different purine bases than RNA

9- The chemical reactions illustrated in the following figure result in the formation of

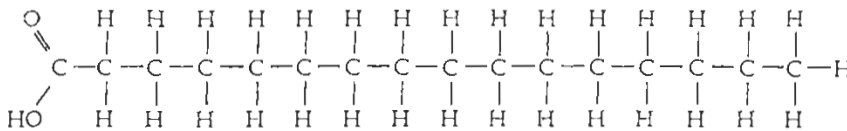


- A- peptid bonds
- B- ionic bonds
- C- a glycosidic bond
- D- a hydrogen bond
- E- none of the above

10- Polymers of polysaccharides, fats, and proteins are all synthesized from monomers by

- A- connecting monosaccharides together
- B- the addition of water to each monomer
- C- the removal of water (dehydration synthesis)
- D- ionic bonding of the monomers
- E- the formation of disulfide bridges between monomers.

11- The molecule shown below is

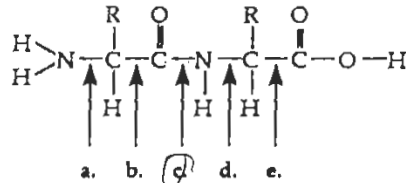


- A- a saturated fatty acid
- B- an unsaturated fatty acid
- C- a polyunsaturated triglyceride
- D- likely to be a common component of plant oils.
- E- similar in structure to a steroid.

12- The formation of polymers is an example of

- A- catabolism
- B- hydrolysis
- C- metabolism
- D- anabolism
- E- none of the above

- 13- At which bond in the following figure would water need to be added to achieve hydrolysis of the dipeptide shown, back to its component amino acids?



2. A- a B- b **C- c** D- d E- e

- 14- The alpha helix and the beta pleated sheet are both common forms found in which level of structure of proteins?

A- primary **B- secondary** C- tertiary D- quaternary
E- Both a and d are correct.

- 15- Which of the following would be found in an animal cell, but not in a bacterial cell?

~~A- DNA~~ ~~B- Cell wall~~ ~~C- Plasma membrane~~
~~D- Ribosomes~~ **E- Endoplasmic reticulum**

- 16- Gap junctions in animal cells are similar in functions to which structure in plant cells?

~~A- Desmosomes~~ ~~B- Tight junction~~
C- Peroxisomes **D- Plasmodesmata** ~~E- Glycocalyx~~

- 17- A cell has the following molecules and structures: enzymes, DNA, ribosomes, plasma membrane, and mitochondria. It could be a cell from

~~A- a bacterium~~ ~~B- an animal, but not a plant~~
~~C- a plant, but not an animal~~ **D- a plant or an animal**
E- any kind of organism

- 18- Cells would be unable to form cilia or flagella if they did not have which cell structure?

~~A- Ribosomes~~ ~~B- Chloroplasts~~
C- Centrioles ~~D- Plastids~~ ~~E- Microfilaments~~

- 19- Large numbers of ribosomes are present in cells that specialize in producing which of the following molecules?

~~A- Lipids~~ ~~B- Starches~~
C- Proteins ~~D- Steroids~~ ~~E- Glucose~~

- 20- Which of the following relationships between cell structures and their respective functions is not correct?

~~A- Cell wall-support, protection~~
B- Chloroplasts-chief site of cellular respiration
~~C- Chromosomes-genetic control of information~~
~~D- Ribosomes-site of protein synthesis~~
~~E- Mitochondria-formaiton of ATP~~

21- Which of the following pairs is mismatched?

- ~~A-~~ Nucleus = DNA replication.
- ~~C-~~ Cytoskeleton: microtubules
- ~~E-~~ Cell membrane: lipid bilayer
- B- Lysosome = protein synthesis
- ~~D-~~ Nucleolus: ribosomal RNA

22- Organelles that contain DNA include

- ~~A-~~ nucleus
- ~~D-~~ mitochondria
- ~~B-~~ chloroplasts
- ~~E-~~ A, B and D
- C- ribosomes

23- According to the fluid-mosaic model of cell membranes, which of the following is a true statement about membrane phospholipids?

- A- They move laterally along the plane of the membrane.
- ~~B-~~ They frequently flip-flop from one side of the membrane to other.
- ~~C-~~ They occur in an uninterrupted bilayer, with membrane proteins restricted to the surface of the membrane.
- ~~D-~~ They are free to depart from the membrane and dissolve in the surrounding solution.
- E- They have hydrophilic tails in the interior of the membrane.

24- What are the membrane structures that function in active transport?

- ~~A-~~ Peripheral proteins
- ~~C-~~ Cholesterol
- E- Integral proteins.
- ~~B-~~ Carbohydrates
- ~~D-~~ Hydrophobic molecules

25- An organism with a cell wall would be unable to do which process?

- A- Diffusion
- C- Active transport
- E- Facilitated diffusion
- D- Phagocytosis
- B- Osmosis

26- Carrier molecules in the plasma membrane are required for

- ~~A-~~ Diffusion
- ~~C-~~ Facilitated diffusion only
- E- Both facilitated diffusion and active transport.
- ~~B-~~ Osmosis
- ~~D-~~ Active transport only

27- The kinds of molecules that pass through a cell membrane most easily are:

- ~~A-~~ large and hydrophobic
- ~~C-~~ large polar molecules
- ~~E-~~ monosaccharides such as glucose
- B- small and hydrophobic
- ~~D-~~ ion

28- The sodium-potassium pump is called an electrogenic pump because it

- ~~A-~~ pumps equal quantities of Na⁺ and K⁺ across the membrane
- ~~B-~~ pumps hydrogen ions into the cell
- C- contributes to the membrane potential
- ~~D-~~ ionizes sodium and potassium
- ~~E-~~ pumps hydrogen ions into the cell and contributes to the membrane potential.

29- How does an enzyme catalyze a reaction?

- A- By supplying the energy to speed up a reaction
 B- By lowering the energy of activation of a reaction
 C- By lowering the ΔG of a reaction
 D- By changing the equilibrium of a spontaneous reaction
 E- By increasing the amount of free energy of a reaction

30- The control of enzyme function is an important aspect of cell metabolism. Which of the following is LEAST likely to be a mechanism for enzyme control?

- A- Allosteric regulation
 B- Cooperativity
 C- Feedback inhibition
 D- Denaturation
 E- All of the above

31- ATP generally energizes a cellular process by

- A- releasing heat upon hydrolysis
 B- acting as a catalyst
 C- direct chemical transfer of a phosphate group
 D- releasing ribose electrons to drive reactions
 E- none of the above

32- What is an organic, nonprotein component of an enzyme molecule called?

- A- An accessory enzyme
 B- An allosteric group
 C- A coenzyme
 D- A functional group
 E- All of the above

33- During the light reactions of photosynthesis, ATP is produced when protons move:

- A- From PSII to PSI
 B- From thylakoid space to stroma
 C- Out of the chloroplast
 D- From water to oxygen
 E- None of the above

34- The most electronegative reduced molecule in the electron transport pathway is

- A- O_2
 B- NADH
 C- $FADH_2$
 D- NADPH
 E- cytochrome b

35- In mitochondria and chloroplasts ATP is made in

- A- matrix and stroma respectively
 B- stroma and matrix respectively
 C- intermembrane space and thylakoid space respectively
 D- matrix and thylakoid space respectively
 E- stroma and intermembrane space respectively

36- DNA polymerase requires

- A- deoxyribonucleoside triphosphates
 B- primer
 C- template
 D- promoter
 E- A, B & C

37- Okazaki fragment formation requires all of the following EXCEPT one

- A- a leading strand
 B- a template strand
 C- a primase
 D- ~~adigase~~
 E- α DNA polymerase

38- In the cytosol, ATP is produced by

- A- oxidative phosphorylation
 C- substrate-level phosphorylation
 E- all of the above
- B- photophosphorylation
 D- glucose phosphorylation

39- The thylakoid membrane is the site for

- A- Calvin cycle
 C- ATP synthase
 E- all of the above
- B- electron transport (chain)
 D- both B & C

40- Nucleosomes contain

- A- DNA
 C- RNA
- B- Histones
 D- NAD E- both A and B

41- RNA processing in eukaryotes includes all of the following EXCEPT:

- A- capping
 C- splicing
 E- Joining of exons
- B- poly A tailing
 D- joining of introns

42- Which of the following is not true for pentoses:

- A- They occur in nucleic acids
 B- Have hydroxyl and carbonyl groups
 C- Can occur in a ring form
 D- Have the formula $C_5H_{12}O_5$
- E- Occur in ATP

43- Chemiosmosis involves

- A- diffusion of water down a concentration gradient
 B- a proton-motive force that drives ATP formation
 C- a proton gradient that drives the redox reaction in the cristae
 D- an ATP synthase that pumps H^+ across the mitochondrial membrane
 E- All of the above

44- The CO_2 that we exhale (breath out) each minute is derived from:

- A- deamination reactions
 C- dehydrogenation reactions
 E- anabolic reactions
- B- decarboxylation reactions
 D- isomerization

45- The genetic codons for some amino acids are: phe = UUU; leu = CUG; His = CAC. Which of the following is a possible nucleotide sequence in the DNA that would code for this peptide His - leu - phe.

- A- GUC - GAC - AAA
 C- GTC - GTC - TTT
 E- AAA - CAG - TTT
- B- CUG - GTC - AAA
 D- GTG - GAC - AAA

46- The anticodon is part of:

- A- DNA B- t-RNA
 C- m-RNA
 D- rRNA
 E- None of the above

47- The binding of a specific amino acid to its particular tRNA:

- A- is an energy driven process
- B- is catalyzed by aminoacyl-tRNA synthetases
- C- occurs in the cytoplasm
- D- all of the above
- E- none of the above

48- The mitochondrion:

- A- has 2 membranes which are equally permeable to protons
- ~~B- is completely dependent on nuclear genome for building of its proteins.~~
- ~~C- can build all its proteins and enzymes~~
- ~~D- has its own DNA and ribosomes~~
- E- none of the above

49- Which of the following is not a component of the respiratory electron transport chain:

- A- Cytochrome
- B- Ubiquinone (Q)
- ~~C- FMN~~
- D- Fo-F1 complex
- ~~E- Fe-S protein~~

50- The conversion of pyruvic acid to acetyl CoA does not involve:

- A- ATP consumption
- ~~B- NAD⁺ reduction~~
- ~~C- Decarboxylation~~
- ~~D- a multienzyme complex~~
- E- CoA

51- Glycolysis is not as energy-productive as cellular respiration because:

- ~~A- NAD⁺ is regenerated by alcohol or lactate production without the high-energy electrons passing through the electron transport chain.~~
- ~~B- it is the pathway common to fermentation and respiration.~~
- ~~C- it does not take place in a specialized membrane-bound organelle~~
- D- pyruvate is more reduced than CO₂ (it still contains much of the energy from glucose).
- E- None of the above.

52- Chloroplasts can make carbohydrate in the dark if provided with:

- A- ATP, NADPH and CO₂
- B- proton gradient
- C- organic acids
- D- a source of hydrogen
- E- O₂

53- Accessory pigments within chloroplasts are responsible for:

- A- driving the splitting of water molecules
- B- absorbing photons of different wavelengths of light and passing that energy to reaction center molecule
- C- extending the absorption spectrum of chlorophyll a
- D- both A and C
- ~~E- ATP production~~

54- In green plants, most of the ATP for cellular activities comes directly from:

- A- photosystem I
- ~~B- the Calvin cycle~~
- C- photophosphorylation
- D- oxidative phosphorylation
- E- Water photolysis

55- When pyruvate is converted to acetyl CoA:

- A- CO₂ and ATP are released
- B- a multienzyme complex removes a carboxyl group and attaches a coenzyme.
- C- One turn of the Krebs cycle is completed
- D- NAD⁺ is regenerated so that glycolysis can continue

56- Which of the following is wrong concerning DNA replication?

- A- it is catalyzed by DNA polymerase
- B- it requires the enzyme helicase
- C- it begins at special sites called origins of replication
- D- synthesis of the complementary strand occurs in the 3' → 5' direction.
- E- Synthesis of complementary strand occurs in the 5' → 3' direction.

57- Which is not a characteristic of the genetic material?

- A- contains sulfur
- B- stores information
- C- can undergo replication
- D- can undergo mutation
- E- controls protein synthesis

58- During DNA replication in prokaryotes, proofreading is carried out by:

- A- RNA primer
- B- ligase
- C- DNA polymerase
- D- Helicase
- E- primase

59- All the following is found in processed eukaryotic mRNA except:

- A- AUT codon
- B- cap
- C- Uracil
- D- Exons
- E- Poly A tail

60- The function of the bacteriophage encoded enzyme which is produced at the end of the lytic cycle is

- A- digestion of the host chromosome
- B- digestion of the bacterial cell membrane
- C- digestion of the bacterial cell wall
- D- assembly of the bacteriophage
- E- all of the above

61- In bacteria, specialized transduction requires infection by

- A- an animal virus
- B- a plant virus
- C- HIV
- D- temperate (lysogenic) phage
- E- virulent phage

62- Which of the following proteins increases the affinity of RNA polymerase to the promoter of lac operon?

- A- repressor
- B- catabolic activator
- C- permease
- D- B-galactosidase
- E- transacetylase

63- Regulatory genes of bacterial operons

- A- code for repressor proteins
- B- are transcribed continuously
- C- are not part of the operon
- D- all of the above
- E- none of the above

72- The chemical signals that function between animals are:

- A- pheromones B- hormones
 C- local regulators D- synaptic signals
 E- paracrine signals

73- Which is a tropic hormone?

- A- oxytocin B- calcitonin
 C- insulin D- glucagon
 E- thyroid-stimulating hormone (TSH)

74- All of the following are amine hormones EXCEPT:

- A- thyroxine (T_4) B- triiodothyronine (T_3)
 C- epinephrine D- norepinephrine E- insulin

75- Secretion of thyroid hormones is regulated by

- A- hypothalamus B- anterior pituitary
 C- posterior pituitary D- parathyroid glands
 E- both A & B

76- The target organ(s) for the parathyroid hormone is/are

- A- intestine B- kidney C- bones
 D- all of the above E- none of the above

77- Which hormone has antagonistic action to insulin?

- A- tyroxin B- calcitonin C- glucagon
 D- thymosin E- melatonin

78- The disease which occurs due to deficiency of insulin is called

- A- tetani B- diabetes mellitus
 C- gigantism D- dwarfism E- acromegaly

79- Which of the following is secreted by the adrenal cortex?

- A- glucocorticoids B- glucagon C- estrogen
 D- androgen E- prolactin

80- Which hormone is secreted in response to stress?

- A- epinephrine B- norepinephrine
 C- glucocorticoids D- mineralo corticoids E- all of the above

81- Which of the following is a steroid hormone

- A- oxytocin B- prolactin C- testosterone
 D- calcitonin E- glucagon

82- Which of the following stimulates milk production and secretion?

- A- insulin B- glucagon C- glucocorticoids
 D- prolactin E- antidiuratic hormone

64- A plasmid

- A- is extrachromosomal circular DNA
- B- can be isolated from bacteria
- C- can replicate independently
- D- is a vector in genetic engineering
- E- all of the above

65- What does a recombinant plasmid contain?

- A- a foreign gene
- B- restriction sites
- C- nonfunctional lac Z gene
- D- functional antibiotic gene
- E- all of the above

66- The source(s) of a gene for cloning is/are

- A- a chromosome digested by restriction enzyme(s)
- B- a gene amplified by PCR
- C- a cDNA prepared from mRNA
- D- all of the above
- E- only A & B are correct

67- The restriction enzymes

- A- break the phosphodiester bonds of DNA
- B- breaks the H-bonds of DNA
- C- join DNA fragments
- D- recognize a specific DNA sequence
- E- both A & D

68- All of the following are used to introduce DNA into cells EXCEPT:

- A- transformation
- B- electroporation (brief electrical pulse)
- C- viruses
- D- injection by thin needles
- E- electrophoresis

69- Polymerase chain reaction is important because it allows

- A- insertion of genes into plasmids
- B- insertion of genes into viruses
- C- synthesis of DNA from tRNA
- D- synthesis of mRNA from DNA
- E- amplification of DNA or cDNA

70- A cycle of polymerase chain reaction includes

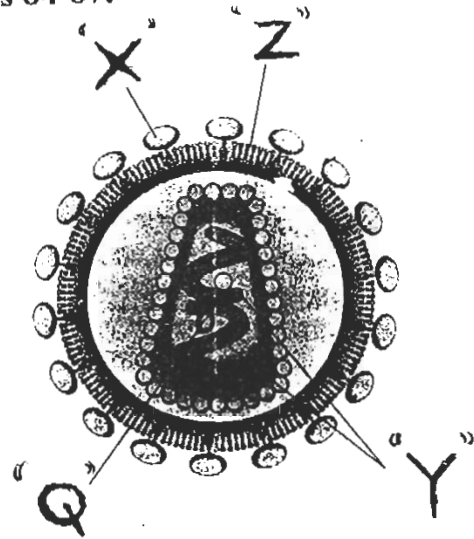
- A- denaturation (separation) of DNA
- B- binding of primers to DNA
- C- extension of primers
- D- all of the above
- E- only B & C are correct.

71- Which enzyme is used in polymerase chain reaction

- A- ligase
- B- primase
- C- DNA polymerase
- D- RNA polymerase
- E- a restriction enzyme

- 83- Which of the following glands releases hormones made by hypothalamus?
 A- anterior pituitary **B-** posterior pituitary C- pineal
 D- adrenal E- thyroid

II- Refer to the following figure to answer questions 84-87:



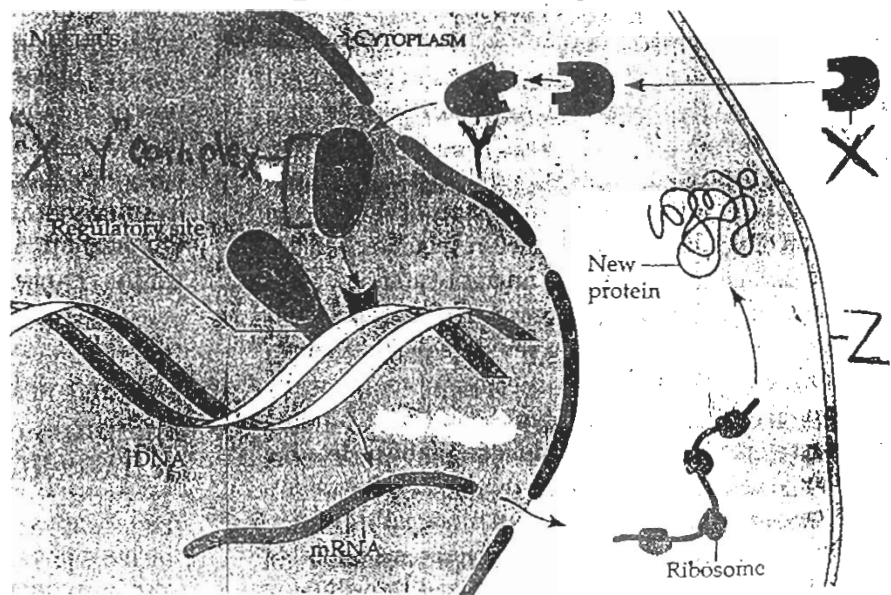
- 84- Structure "X" of this virus
~~A-~~ is a glycoprotein
~~B-~~ is a glycolipid
~~C-~~ is capsomere
~~D-~~ has a specific receptor on the host cell
E- both A & D

- 85- The viral nucleic acid "Y" is a
~~A-~~ single stranded DNA **B-** single stranded RNA
~~C-~~ double stranded DNA D- double stranded RNA
~~E-~~ any of the above is correct

- 86- Structure "Z" of this virus is derived from the host
~~A-~~ Golgi apparatus ~~B-~~ endoplasmic reticulum
~~C-~~ nuclear membrane **D-** cell membrane
~~E-~~ mitochondria

- 87- During replication, enzyme "Q" catalyses synthesis of
~~A-~~ tRNA ~~B-~~ mRNA
~~C-~~ rRNA **D-** cDNA E- double stranded RNA

III- Refer to the following figure to answer questions 88-90



88- Molecule "X" is a

- A- peptide hormone
- B- amine hormone
- C- protein hormone
- D- glycoprotein
- E- steroid hormone

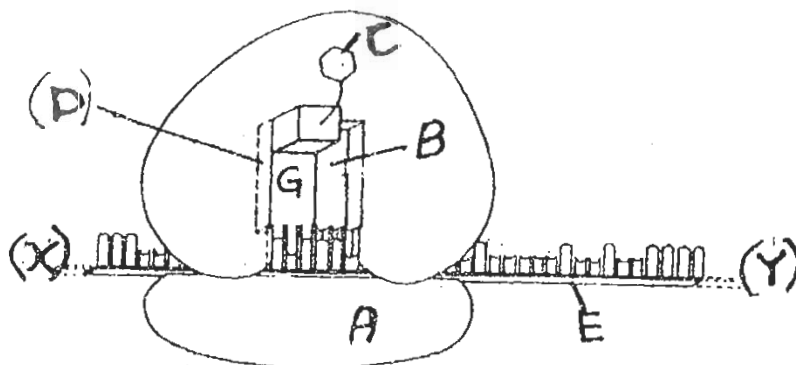
89- Molecule "Y" is

- A- relay protien
- B- effector
- C- receptor for molecule X
- D- first messenger in the signal transduction pathway
- E- Second messenger in the signal transduction pathway

90- In this figure, binding of X-Y complex to the cells genome

- A- supresses gene expression
- B- induces gene expression
- C- inhibits enzyme
- D- activates enzymes
- E- changes cell's permeability.

IV- Refer to the following figure to answer questions 91-94



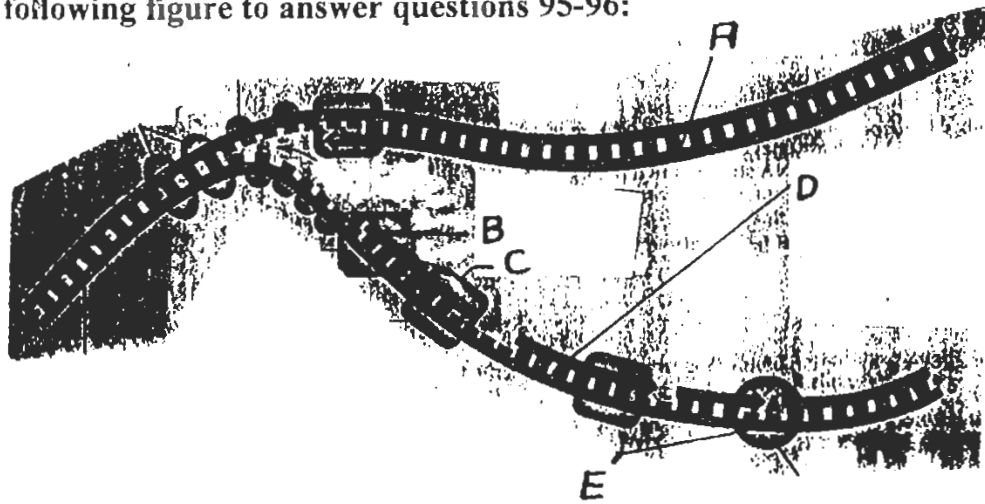
91- Which letter represents a small ribosome? A

92- Which letter represent aminoacyl tRNA binding site? B

93- Which letter represents the codon carrying molecule? D

94- Which letter represents methionine?

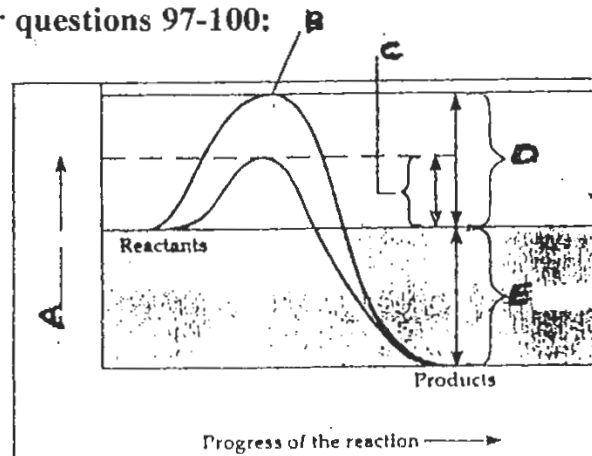
V- Refer to the following figure to answer questions 95-96:



95- Which letter represents Okazaki fragment? **D**

96- Which letter represents RNA primer? **B**

VI- Refer to the following figure to answer questions 97-100:



97- Does the above represent an:
 A- exergonic B. endergonic reaction
 **A** (letter).

98- ΔG is represented by **E** (letter)

99- Which letter represents the transition state? **B**

100- Which letter represents the energy activation of the catalyzed reaction? **C**

GOOD LUCK

B.KH.

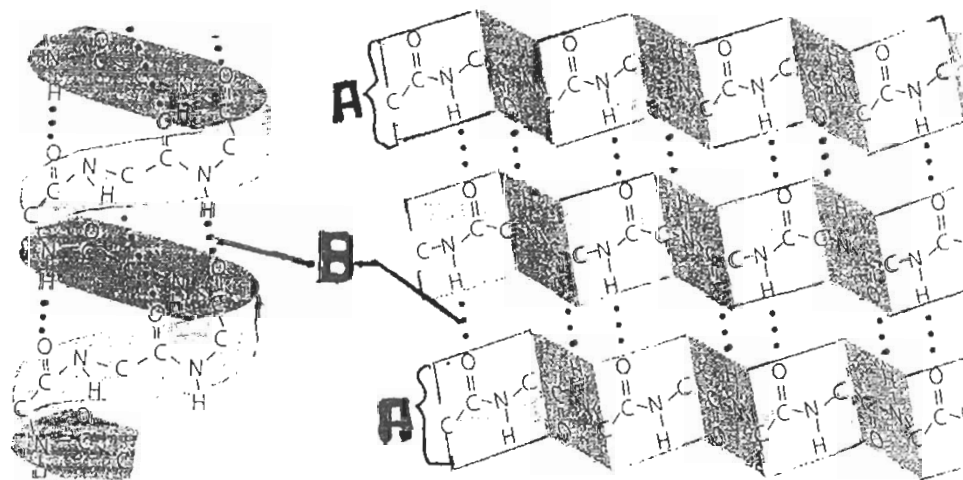
الاسم _____ رقم التسجيل _____ رقم الجلوس _____
المدرس _____ أيام المحاضرات _____ وقت المحاضرة _____

WRITE THE MOST APPROPRIATE ANSWERS ON YOUR ANSWER SHEET

I. Multiple Choice Questions

- 1. The polarity of water molecules allows them to form----- bonds with each other
A. hydrogen B. ionic C. covalent
D. disulfide E. van der Waals
- 2. An amino acid can dissolve in water because it is
A. hydrophobic B. thermophilic C. charged
D. non-polar E. both B and C
- 3. Water is most suitable for evaporative cooling due to its high
A. resolution. B. pH C. specific heat
D. molecular weight E. all the above
- 4. Two monomers of glucose can form a molecule of maltose following
A. heating B. condensation reaction C. hydration reaction
D. cooling E. adding salt
- 5. Which of the following linkages is more abundant in glycogen than starch
A. phosphodiester B. 1-4 glycosidic C. 1-6 glycosidic
D. 1-2 glycosidic E. disulfide
- 6. The following interactions may be found in the quaternary structure of proteins
A. H- bonds B. ionic interactions C. hydrophobic interactions
D. disulfide bridges E. all of the above
- 7. A lipid from which steroid hormones are built is
A. testosterone B. estradiol C. glucagon
D. cholesterol E. olive oil

Answer questions 8-10 by referring to the following figure



- 8. In the figure above, "A" represents:
A. secondary structure B. β -pleated sheet C. α -helix
D. quaternary structure E. both A and B
- 9. "B" represents
A. a peptide bond B. a disulfide bridge C. H-bond
D. an ionic bond E. all the above
- 10. Together, "A" + "B" can be found in a protein's
A. primary structure B. tertiary structure only C. secondary structure only
D. both B and C E. all of the above

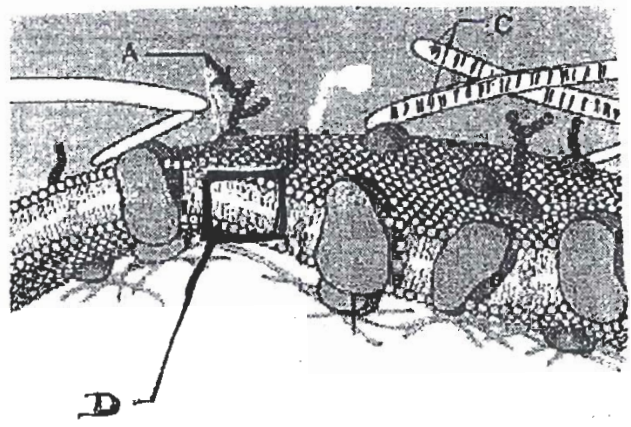
- 11. Which of the following amino acids may be involved in formation of a disulfide bridge
 A. serine B. proline C. tyrosine
 D. methionine E. cysteine.
- 12. Oils are liquid at room temperature because they contain high content of
 A. saturated fatty acids B. unsaturated fatty acids C. glycerol
 D. cholesterol E. cellulose
- 13. The resolving power of a light microscope is about
 A. 0.2 nm B. 0.2 um C. 0.2 mm D. 0.02 mm E. 0.02 nm
- 14. Detailed information about the shape and external features of a specimen can best be obtained by a
 A. light microscope B. fluorescence microscope C. transmission E.M.
D. scanning E.M. E. centrifuge
- 15. The plasma membrane is a characteristic of
A. all cells B. prokaryotic cells only C. eukaryotic cells only
 D. animal cells only E. plant cells only

- 16. Which of the following is correctly matched
 A. mitochondrion—photosynthesis B. nucleus—respiration C. lysosome—movement
D. nucleolus—ribosome production E. ribosome—synthesis of lipids
- 17. All of the following are associated with movement in or by cells, except
 A. cilia B. flagella C. actin D. myosin E. peroxisomes
- 18. The cell shown in this figure is in a -----solution because it -----
A. hypotonic---is turgid B. hypotonic—lysed C. hypertonic—lysed
 D. hypertonic—lost water E. hypertonic —gained water



- 19. A white blood cell engulfing a bacterium shows a process of
 A. pinocytosis B. phagocytosis C. exocytosis D. diffusion E. active transport

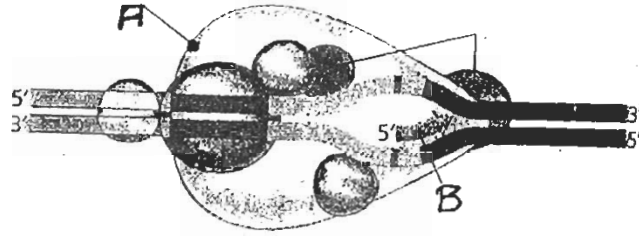
Refer to the following figure to answer questions 20-22



- *---20. The function of structure "A" is
 A. support of the cell B. stabilization of the phospholipid C. cell-cell communication
 D. active transport E. enzymatic
- 21. Structure "D" is a
 A. glycoprotein B. cholesterol C. protein D. phospholipid bilayer E. glycolipid
- 22. Structure "C" is a
A. collagen B. fibrin C. integrin D. laminin E. fibronectin

- 23. Which term refers to the breakdown of large molecules into smaller ones
A. metabolism B. catabolism C. anabolism D. dehydration E. catalysis
- 24. A biological reaction with a positive ΔG is known as
A. exergonic B. exothermic C. endergonic D. hypothermic E. enthalpic
- 25. A noncompetitive inhibitor binds to which part of the enzyme?
A. active site ~~B. away from active site~~ C. cofactor D. coenzyme E. A + C
- 26. A factor which *does not* affect the rate of enzymatic activity is
A. pH B. temperature C. substrate concentration
D. enzyme concentration E. none of the above
- 27. Suppose a yeast cell uses 10 glucose molecules for energy production, and no oxygen is available. What will be the *net* yield of ATP ?
A. 12 B. 15 C. 20 D. 30 E. 36
- 28. All of the following are produced in a muscle cell under anaerobic conditions, *except*
A. ATP B. pyruvate C. lactate D. NADH E. acetyl CoA
- 29. Which of the following is *not* a feature of the Krebs cycle?
A. production of ATP B. production of NADH C. production of $FADH_2$
D. production of CO_2 E. production of pyruvate
- 30. How many carbon atoms does each acetyl CoA feed into the Krebs cycle
A. 2 B. 4 C. 6 D. 8 E. 10
- 31. During oxidative phosphorylation, oxygen atoms are reduced to
A. glucose B. pyruvate C. lactate D. water E. carbon dioxide
- 32. In the electron transport chain, if electrons are passed to FAD, the number of ATP produced is
A. 2 B. 3 C. 4 D. 6 E. 9
- 33. In mitochondrial chemiosmosis, the hydrogen ions are pumped from the ----- to the -----
A. matrix -intermembrane space B. intermembrane space-matrix C. matrix-cytoplasm
D. cytoplasm -matrix E. none of the above
- 34. ATP synthase is located in the membranes of
A. Gogi bodies B. mitochondria C. chloroplasts D. nucleus E. B + C
- ~~X~~---35. A molecule which links glycolysis to Krebs cycle is
A. ethanol B. lactate C. pyruvate D. glucose E. A + B
- 36. All of the following elements are present in DNA, *except*
A. phosphorus B. nitrogen C. sulfur D. carbon E. oxygen
- ~~X~~---37. Radioactive sulfur (S^{35}) in a culture medium containing bacteria and viruses will appear in the
A. bacterial RNA B. viral RNA C. viral coats D. viral DNA E. bacterial cell wall
- 38. Which enzyme catalyzes the elongation of a DNA strand in the 5'---3' direction ?
A. DNA ligase B. DNA polymerase C. topoisomerase D. primase E. ligase
- 39. The semiconservative model of DNA replication was proven by
A. Watson & Crick B. Chargaff C. Meselson & Stahl D. Griffith E. Hershey & Chase

Refer to the following figure to answer questions 40 - 42



- 40. The whole figure represents
 A. translation initiation complex B. transcription initiation complex C. RNA polymerase
 D. translation factor E. transcription factor
- 41. Molecule "A" represents
A. RNA polymerase II B. DNA polymerase C. RNA transcript
 D. RNA primase E. template DNA strand
- 42. Molecule "B" represents
A. RNA transcript B. DNA script C. DNA template D. primase E. nuclease
- 43. The 5' Cap of a mRNA molecule functions in
 A. protection of mRNA only B. release of mRNA C. hydrolysis of mRNA
 D. attachment to the ribosome only E. A + D
- 44. If, in nature, there are only 12 amino acids, what would be the smallest possible codon size in a genetic system with four different nucleotides?
 A. 1 B. 2 C. 3 D. 4 E. 6
- 45. If the UUU codes for the amino acid phenylalanine in bacteria, then in plants UUU should code for
 A. leucine B. alanine C. phenylalanine D. proline E. valine
- 46. Aminoacyl tRNA synthetase active site can bind
 A. amino acid B. ATP C. tRNA D. A + B + C E. A only
- 47. The formation of translation initiation complex requires
 A. ATP B. GTP C. mRNA+ribosome D. initiation factors E. all except A
- 48. Translation elongation cycle consists of
 A. binding of next aminoacyl to A site B. peptide bond formation C. translocation
 D. release of vacant tRNA from E site E. all of the above
- 49. The first amino acid in the translation process is always
 A. glycine B. alanine C. methionine D. valine E. cysteine
- 50. During translation, GTP is required for
 A. initiation B. elongation C. termination D. A + B + C E. A + B
- 51. Reverse transcriptase catalyses the production of ---- from -----
 A. DNA-DNA B. RNA-DNA C. RNA-RNA D. DNA-RNA E. RNA-protein
- 52. The function of restriction enzymes is to
 A. link 2 DNA fragments B. prepare cDNA C. cut nucleic acids at recognition sites
 D. transcribe lac Z gene E. express ampicillin resistance
- 53. Which of the following is *not* required to prepare cDNA
 A. RNA polymerase B. RNA nuclease C. RNA template D. nucleotides E. DNA polymerase
- 54. A cycle of PCR includes

- 55. Clones containing plasmids with gene of interest are identified by
A. microscopy B. nucleic acid hybridization C. X-Ray D. A + C E. B + C
- 56. In mitosis, at which stage do centrioles *begin* to move apart?
A. prophase B. metaphase C. prometaphase D. anaphase E. telophase
- 57. The number of centromeres in a human somatic cell at prophase is
A. 23 B. 46 C. 92 D. 44 E. 22.
- 58. Structures which are involved in cleavage furrow formation are
A. microtubules B. microfilaments C. intermediate filaments D. A + B E. A + C
- 59. The stage of meiosis at which homologous chromosomes are separated is
A. prophase I B. metaphase I C. anaphase I D. anaphase II E. telophase I
- 60. A process in which meiosis is not needed is
A. oogenesis B. spermatogenesis C. tissue repair D. A + B E. B + C
- 61. The main target organs for the tropic hormones are
A. stomach B. muscles C. spleen D. B + C E. endocrine glands
- 62. Which of the following is both endocrine and exocrine?
A. pituitary B. thyroid C. pineal D. pancreas E. parathyroid
- 63. A hormone which is involved in biological rhythms is
A. melatonin B. calcitonin C. estrogen D. thyroxine E. epinephrine
- 64. Stimulation of contraction of the uterus is by which hormone?
A. prolactin B. oxytocin C. calcitonin D. ADH E. thyroxin
- 65. Which of the following hormones is antagonistic to insulin?
A. parathyroid B. estrogen C. glucagon D. FSH E. ADH
- 66. The endocrine disorder which is caused by deficiency of insulin is
A. diabetes insipidus B. goiter C. diabetes mellitus D. gigantism E. dwarfism
- 67. Which of the following is *not true* about growth hormone?
A. is a protein B. is secreted by anterior pituitary C. promotes growth
D. can be produced by DNA cloning E. none of the above
- 68. Which of the following *does not* apply to epinephrine?
A. secreted by adrenal cortex B. increases blood pressure C. increases breathing rate
D. increases metabolic rate E. secreted in response to short term stress
- 69. Which of the following hormones are secreted by the adrenal gland in response to long term stress?
A. endorphin B. melatonin C. ADH D. ACTH E. glucocorticoids
- 70. A chemical signal which functions between individuals of the same species is a
A. hormone B. pheromone C. local regulator D. B + C E. A + B
- 71. Which of the following *does not* occur during the Calvin cycle?
A. use of ATP B. use of CO₂ C. use of NADPH D. B + C E. reduction of O₂
- 72. The final product of the regeneration reaction in the Calvin cycle is
A. CO₂ B. ATP C. ribulose biphosphate D. NADPH E. G3P
- 73. During photosynthesis, electron transport from water pass through photosystems II & I to reduce
A. CO₂ B. NADP⁺ C. ribulose bisphosphate D. FAD E. cytochrome complex
- 74. A photosystem (PS) which *does not* function during cyclic electron flow is
A. I B. II C. antenna complex D. III E. B + C
- 75. The sites of the light reactions in photosynthesis are the
A. thylakoids B. stroma C. stomata D. A + B E. guard cells
-

Name:.....Registration No.:..... Seat No.:.....
 Instructor:..... Section:..... Hall :.....

Answer sheet

	A	B	C	D	E		A	B	C	D	E		
1					X	35			X			67	Adenylyl cyclase
2				X		36			X			68	Phosphodiesterase
3		X				37				X		69	A
4				X		38	X					70	B
5			X			39	X					71	DNA polymerase
6			X			40			X			72	Phosphodiester
7				X		41			X			73	B = 5' CAT 3'
8			X			42		X				74	Translation
9		X				43			X			75	Codon
10		X				44					X	76	Z
11				X		45	X					77	Reverse transcriptase
12				X		46					X	78	E
13				X		47					X	79	C
14	X					48					X	80	E
15				X		49					X	81	D
16				X		50			X			82	B
17					X		<u>II. Matching</u>					83	Trp-Operon
18		X				51	C						<u>IV. Fill in the Blanks</u>
19			X			52	E					84	Coupling
20				X		53	H					85	Redox
21	X					54	F					86	Prosthetic
22			X			55	G					87	Chemiosmosis
23	X					56	I					88	Calmodulin
24		X				57	D					89	S
25			X			58	B					90	Spliceosomes
26			X			59	A					91	Poly A tail
27				X		60	J					92	Exons
28				X			<u>III. Drawings</u>					93	Leader
29		X				61	A = Exergonic					94	Frameshift
30				X		62	E					95	Lytic
31			X			63	B					96	Mutation
32				X		64	C					97	Provirus
33				X		65	Reception					98	A = transduction
34		X				66	G-protein					99	D = transformation
												100	E = conjugation

Name:..... Registration No.:..... Seat No.....
Instructor:..... Section:..... Hall :.....

Mark with (X) the most correct answer on your answer sheet .

I. Multiple Choice Questions :

1. Each of the following is a property of water EXCEPT

- A. molecules are cohesive B. versatile solvent C. high specific heat
D. maximum density at 4°C E. low heat of vaporization

2. Which of the following react(s) with water in the air to form acids?

- A. sulfur oxides B. nitrogen oxides C. carbon dioxide
D. all of the above E. none of the above

3. Which of the following membrane-bound structures of plant cells contains DNA?

- 1.Golgi apparatus 2.nucleus 3.endoplasmic reticulum 4.mitochondria 5.peroxisome 6.chloroplasts
A. 1, 2, and 5 B. 2, 4, and 6 C. 2 and 5 D. 2, 3, and 4 E. 2 only

4. Which of the following is a characteristic of microfilaments?

- A. super-coiled fibrous protein B. hollow tube made of tubulin
C. a member of the keratin family D. two intertwined strands of actin
E. are an important component of the nuclear lamina

5. The dominant organelle found in cells active in lipid synthesis is/are

- A. ribosomes B lysosomes C. smooth endoplasmic reticulum
D. contractile vacuoles E. plastids

6. Which one of the following is correctly matched?

- A. chloroplast – storage of enzymes B. lysosome – powerhouse of the cell
C. nucleolus – site of ribosomal synthesis D. glyoxysome – structural support of the cell
E. Golgi complex – production of energy

7. A cell takes droplets of liquid containing dissolved materials by

- A. facilitated diffusion B. exocytosis C. phagocytosis
D. pinocytosis E. the sodium potassium pump

8. Cell fractionation and centrifugation are the best techniques for which one of the following?

- A. getting images of structures inside cells B. measuring cell activity
C. separation of organelles for analysis D. measuring cell surface to volume ratio
E. determining protein conformation

9. Ions can travel directly between adjacent animal cells through

- A. plasmodesmata B. gap junctions C. desmosomes D. microtubules E. tight junctions

10. Peroxisomes are associated with

- A. synthesis of complex sugars B. alcohol detoxification C. storage of calcium
D. oxidative phosphorylation E. protein targeting

11. The alpha helix and beta-pleated sheet are formed by

- A. hydrogen bonding between R-groups B. ionic interactions between R-groups
C. non-covalent interactions between the R-groups and polypeptide backbone
D. hydrogen bonding between atoms of the polypeptide backbone
E. hydrophobic interaction between alpha amino acids

12. A plant cell stores compounds that may include sugars, salts, and pigments in
 A. Golgi apparatus B. endoplasmic reticulum C. nucleus D. vacuole E. extracellular matrix (ECM)
13. The main component of lipids in a biological membrane is
 A. cholesterol B. triglyceride C. steroid D. phospholipids E. none of the above
14. Which of the following factors tend to increase membrane fluidity?
 A. greater content of unsaturated phospholipids B. high protein content C. low temperature
 D. greater content of large glycolipids E. high membrane potential
15. Which of the following processes includes all others in the list?
 A. osmosis B. diffusion of a solute across a membrane C. facilitated diffusion
 D. passive transport E. transport of an ion down its electrochemical gradient
16. When proteins are degraded, the intermediate products could enter the pathway of cellular respiration as
 A. Acetyl CoA B. pyruvate C. α -ketoglutarate D. all of the above E. none of the above
17. Examples of cellular work is /are
 A. cell division B. active transport C. movement
 D. synthesis of complex molecules E. all of the above
18. The reaction that connects glycolysis with Krebs cycle is
 A. dihydroxyacetone \rightarrow glyceraldehyde phosphate B. pyruvate \rightarrow acetyl CoA
 C. acetyl CoA \rightarrow citrate D. oxaloacetate \rightarrow citrate
 E. glyceraldehyde phosphate \rightarrow 1,3-bisphosphoglycerate
19. Which of the following statements is true regarding cellular respiration
 A. glycolysis is a source of ATP only
 B. Krebs cycle generates two ATP per turn by substrate-level phosphorylation
 C. most of electron carriers between ubiquinone and oxygen, are proteins called cytochromes
 D. ATP synthase is present in the outer membrane of mitochondria E. none of the above
20. During cellular respiration; ATP production, by substrate-level phosphorylation, occurs in
 A. cytosol B. mitochondrial matrix C. mitochondrial intermembrane space
 D. A and B are correct E. A and C are correct
21. The key enzyme controlling cellular respiration is
 A. phosphofructokinase B. enolase C. dehydrogenase D. mutase E. aldolase
22. The fixation of one CO₂ in the Calvin cycle requires
 A. 9 ATP + 6 NADPH B. 6 ATP + 6 NADPH C. 3 ATP + 2 NADPH
 D. 2 ATP + 1 NADPH E. 1 ATP + 1 NADPH
23. The photolysis (splitting) of water occurs at
 A. photosystem II B. photosystem I C. both photosystems I & II D. stroma E. all of the above
24. The function of the thylakoid space matches that of
 A. mitochondrial matrix B. mitochondrial intermembrane space C. mitochondrial cristae
 D. mitochondrial outer membrane E. none of the above
25. The CO₂ in the Calvin cycle is added to
 A. bisphosphoglyceric acid B. phosphoglyceraldehyde C. ribulose bisphosphate
 D. phosphoenol pyruvate E. oxaloacetate
26. The wavelengths which are most active in photosynthesis are
 A. green & yellow B. green & red C. red & blue D. green & blue E. violet & blue
27. In cyclic photophosphorylation, the source of the excited electron is
 A. photosystem II B. P₆₈₀ C. photon & sunlight D. P₇₀₀ E. B & D

28. Most signal molecules

- A. bind to specific sites on receptor proteins in a membrane B. are water-soluble
C. are able to pass through the plasma membrane by active transport D. A & B E. A, B, & C

29. Which of the following is true of hormone signaling?

- A. occurs in animals only B. is important between cells that are at great distance apart
C. uses neurotransmitters D. is a form of paracrine signaling E. is a form of synaptic signaling

30. In trying to determine whether DNA or protein was the genetic material, Hershey and Chase made use of which of the following facts?

- A. DNA does not contain sulfur, whereas protein does
B. DNA contains phosphorus, but protein does not
C. DNA contains greater amounts of nitrogen than does protein
D. A&B are only correct E. A, B, & C are correct

31. All of the following were determined directly from X-ray diffraction photographs of crystal DNA except

- A. the diameter of the double helix B. the helical shape of DNA C. the sequence of nucleotides
D. the linear distance required for one full turn of the double helix E. the width of the helix

32. Which of the following if absent or defective, would prevent the production of others?

- A. tRNA B. rRNA C. mRNA D. RNA polymerase E. aminoacyl-tRNA synthetase

33. The followings are directly involved in translation EXCEPT

- A. mRNA B. tRNA C. ribosomes D. DNA E. GTP

34. Which is the first event in translation in eukaryotes?

- A. elongation of polypeptide B. binding of mRNA to the small ribosomal subunit
C. binding of the two ribosomal subunits D. peptide bond formation between two amino acids
E. both A and B happen at the same time

35. During translation, chain elongation continues until

- A. A site is empty B. aminoacyl-tRNA enters P site C. the stop codon is reached
D. the termination sequence is reached E. TATA box is reached

36. Which of the following is TRUE for both prokaryotic and eukaryotic gene expression?

- A. the primary transcript is capped at 5' end B. translation can begin before transcription is complete
C. RNA polymerase attachment at the promoter site of the DNA
D. mRNA is synthesized from 3' to 5' direction E. primary transcript will be processed

37. One function of the signal sequence is

- A. to direct mRNA to the cisternal space of ER B. to bind RNA polymerase to DNA
C. to terminate translation of the mRNA D. to attach ribosomes to ER E. all of the above

38. All of the following are transcribed from DNA EXCEPT

- A. proteins B. exons C. rRNA D. tRNA E. snRNA

39. Polyribosomes (polysomes) are

- A. group of ribosomes translating a mRNA simultaneously
B. ribosomes containing more than two subunits
C. many ribosomes associated with a chromosome
D. aggregations of vesicles in cytosol E. in prokaryotes and not in eukaryotes

40. All of the following are found in prokaryotic mRNA EXCEPT

- A. AUG codon B. UGA codon C. polyA tail D. uracil E. cytosine

41. Which of the following shows the flow of information in bacteria?

- A. RNA→DNA→protein B. protein→DNA→RNA C. DNA→RNA→protein
D. RNA→protein→DNA E. DNA→protein→RNA

42. Which of the following processes occurs in the cytoplasm of a eukaryotic cell?

- A. DNA replication B. initiation of translation C. transcription
D. RNA processing E. excision repair

43. All is true about transcription of eukaryotic gene EXCEPT

- A. uses only DNA strand as a template B. occurs in the nucleus C. coupled to translation
D. requires RNA polymerase and transcription factors
E. results in primary transcript that will undergo processing

44. What is not true of a codon? It

- A. consists of 3 nucleotides B. is read from 5' to 3' direction C. is the basic unit of the genetic code
D. may code for the same amino acid as another codon does E. may code for one or more amino acids

45. Which of the following characteristics or processes is common to both bacteria and viruses?

- A. nucleic acid as the genetic material B. cell division C. conjugation
D. ribosomes in the cytoplasm E. cell wall

46. The host range of a virus is determined by

- A. the structure of the viral capsid B. enzymes produced by the virus before it infects the cell
C. proteins on the surface of the cell D. whether the viral genome is DNA or RNA E. both A & C

47. Viral envelopes are generally

- A. composed of proteins B. made of peptidoglycan cell wall material C. composed of a lipid bilayer
D. composed of single-stranded RNA E. A and C are correct

48. Which of the following processes would not contribute to genetic variation within a bacterial population?

- A. transformation B. transduction C. conjugation D. mutation E. cell division

49. The lactose (lac) operon is likely to be transcribed when

- A. there is more glucose in the cell than lactose B. there is lactose but no glucose in the cell
C. there is more lactose in the cell than glucose D. the cyclic AMP levels are high within the cell
E. all of the above

50. Operon is important for

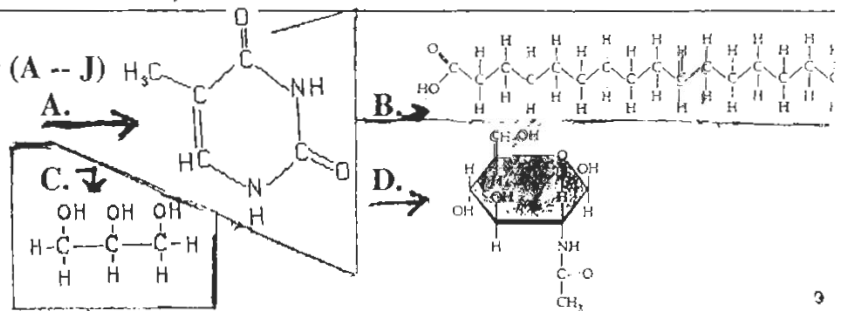
- A. bacterial resistance to antibiotics B. mechanism of viral attachment to a host cell
C. control mechanism of gene expression in bacteria D. control of gene expression in eukaryotes
E. both C and D are correct

II. Matching

Match the terms (51 – 60) with items (A -- J)

- 51. glycerol
..... 52. amylopectin
..... 53. basic amino acid
..... 54. estrogen

- 55. pleated sheet
..... 56. polymer of β glucose
..... 57. monomer of chitin
..... 58. fatty acid
..... 59. pyrimidine
..... 60. collagen



- E. alpha glucose polysaccharide with occasional 1-6 glycos bond
F. a steroid
G. secondary structure of a protein
H. normally positively charged
I. cellulose
J. extracellular matrix (ECM)

III. Drawings

Figure A

61. This figure represents an
 - A. exergonic reaction
 - B. endergonic reaction
62. ΔG is represented by the letter
63. The transition state is represented by the letter
64. The activation energy of a catalyzed reaction is represented by the letter

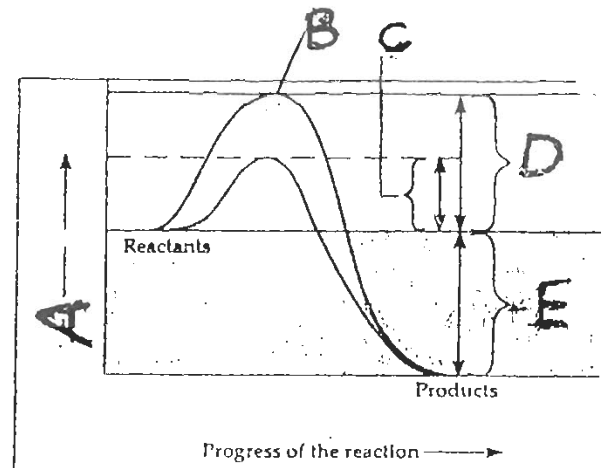


Figure B

65. Binding of a signal molecule to "A" is called
66. "B" is the active form of
67. Name the enzyme "C"
68. The second messenger shown is inactivated by

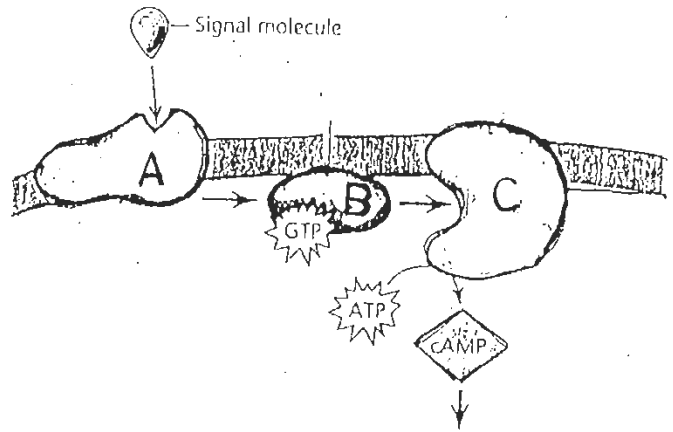


Figure C

69. Which letter indicates the 5' end?
70. At which end (use letter) would the next nucleotide be added?
71. Name the enzyme catalyzing the above reaction
72. Name the bond formed
73. The base sequence of the DNA strand made from this template would be

A. 3'CUC 5'	B. 5'CAT 3'
C. 5'CUC 3'	D. 3'CAT 5'

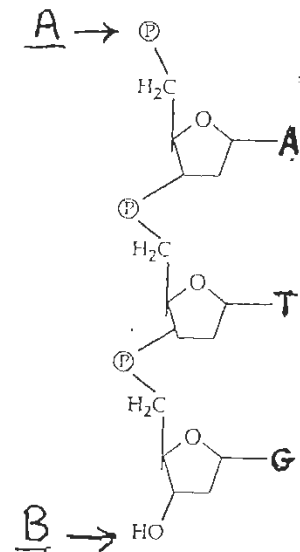


Figure D

74. The whole process represented by this figure is called
75. The sequence C represents a
76. Which part has ribozyme activity?..... (X, Y, or Z)

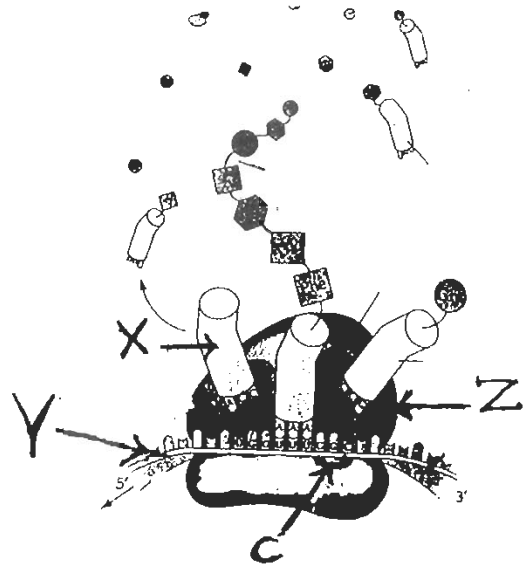


Figure E

77. The enzyme responsible for process (A) is called
78. Viral self-assembly is represented by the letter
79. Formation of a provirus is represented by the letter

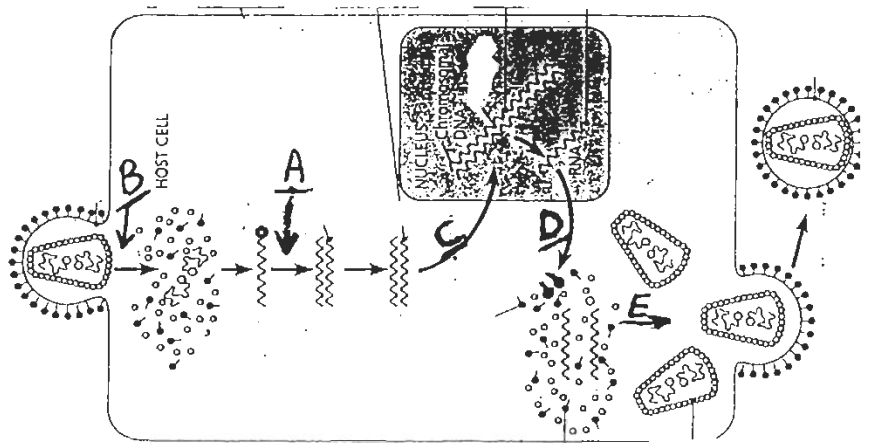
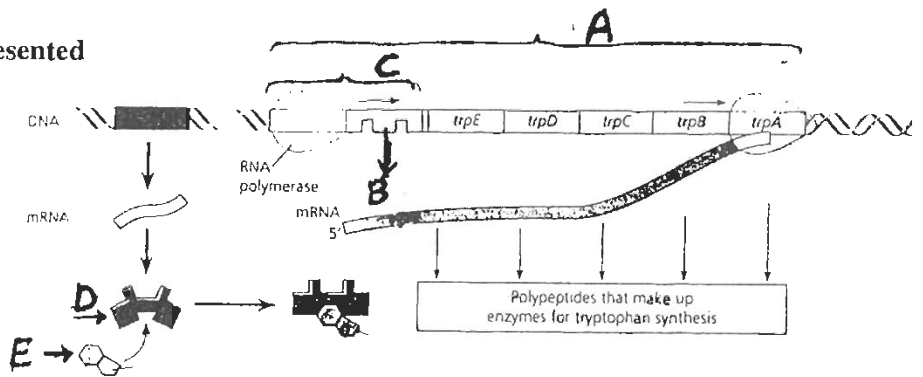


Figure F

80. The corepressor is represented by the letter
81. The protein that is produced by a regulatory gene is represented by the letter
82. The operator is represented by the letter
83. Name the stretch of DNA represented by the letter (A)



IV. Fill in the Blanks

84. The transfer of energy from catabolism to anabolism is called energy
85. The reactions that involve the transfer of electrons from one reactant to another are defined as reactions.
86. The non-protein component that is tightly bound to the electron carriers is called a group.
87. The mechanism of coupling of H^+ gradient with the redox reactions in the electron transport chain for ATP synthesis is called
88. A calcium binding protein, that is involved in cellular responses, is called
89. DNA replication occurs during the phase of the cell cycle.
90. are complexes of proteins and snRNA that splice pre-mRNA.
91. Pre-mRNA processing involves addition at the 3'end ,and the addition of a cap at the 5' end.
92. The coding segments of pre-mRNA are called
93. The mRNA segment upstream of the start codon is called the
94. A mutation could result from insertion or deletion of one base-pair in the gene.
95. A phage reproductive cycle that results in the direct death of the host cell is known as
96. is a change in the genetic material of a cell .
97. An animal virus, that integrates its genome into its host chromosome and remains latent, is called a

Use the following answers for questions (98 – 100)

- A. transduction B. transcription C. translation D. transformation E. conjugation
98. DNA is transferred from one bacterium to another by a virus.
99. Uptake of DNA pieces from closely related species by bacteria with the help of surface proteins
100. A plasmid is transferred between bacteria through sex pili
-

“ GOOD LUCK “

I- Multiple Choice Questions: Mark with 'X' the most correct answer on your answer sheet.

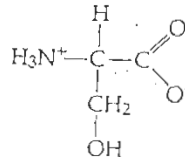
- 1- Which of the following bonds is broken when water vaporizes
- A- Polar covalent bond
 - B- Bonds between water molecules
 - C- Nonpolar covalent bonds
 - D- Bonds between atoms of individual water molecules
 - E- None of the above
- 2- Which of the following is an example of a hydrophobic material?
- A- Wood
 - B- Ionic or polar substances
 - C- Sponges
 - D- Vegetable oils
 - E- None of the above
- 3- Which one of the following helps maintain the column of water in a plant vessels
- A- Evaporation and transpiration
 - B- Adhesion and cohesion
 - C- Surface tension and specific heat
 - D- Heat of vaporization and evaporation
 - E- Specific heat and water transport
- 4- Boiling an egg causes
- A- protein hydrolysis
 - B- lipid hydrolysis
 - C- protein denaturation
 - D- formation of micelle
 - E- none of the above
- 5- Which of the following is involved in α -helix formation of a polypeptide?
- A- Hydrogen bonds between side chains
 - B- Disulfide bonds
 - C- Ionic bonds
 - D- Hydrophobic interaction
 - E- None of the above
- 6- Which one of the following bonds is considered a covalent bonds
- A- Peptide bond
 - B- Glycosidic bond
 - C- Ester bond
 - D- A, B, and C are correct
 - E- None of the above
- 7- Which of the following compounds has the highest amount of energy per grams
- A- Amylose
 - B- Protein
 - C- Plant oil
 - D- Cellulose.
 - E- Chitin
- 8- Nucleic acids are polymers of:
- A- nucleotides
 - B- nucleoside monophosphate
 - C- nucleotide triphosphate
 - D- A and B are correct
 - E- A, B, and C are correct

9- Which of the following processes includes all others in the lists

- A- Facilitated diffusion
- B- Osmosis
- C- Diffusion
- D- Passive transport
- E- Transport of an ion down its electrochemical gradient

10- The following amino acid is

- A- Polar charged amino acid
- B - Polar uncharged amino acid
- C- Non-polar charged amino acid
- D - Non-polar uncharged amino acid
- E- None of the above



11- The internal solute concentration of a plant cell is about 0.4 M. The cell will be turgid if it is placed in

- A- dry soil
- B- 0.4 M solution
- C- 0.8M solution
- D- 0.1 M solution
- E- Any of the above

12- For a protein to fully function, it should have:

- A- primary structure
- B- secondary structure
- C- tertiary structure
- D- A, B, and C are correct
- E- B and C are correct

II- Refer to the following lists and answer questions 13-20:

List I (Questions 13-14)

- A- Ribosomes
- B- Smooth endoplasmic reticulum
- C- mitochondria
- D- Rough Endoplasmic reticulum
- E- Lysosome

13- Which of the above is the site for detoxification of drugs?

14- Which of the above is the site for autophagy?

List II (Questions 15-16)

- A- Tubulin
- B- Actin
- C- Keratin
- D- Collagen
- E- fibronectin

15- Which of the above is a major component of a cilium

16- Which of the above is a component of intermediate filaments

List III (Questions 17-18)

- A- Mitochondria
- B- Centeriole
- C- Nucleolus
- D- Cell wall
- E- Lysosomes

17- Which of the above is absent in animal cells

18- Which of the above is composed of microtubules

List IV (Questions 19-20): Match two of the following enzymes to the reactions they catalyze

- A- Kinase
- B- Isomerase
- C- Dehydrogenase
- D- Decarboxylase
- E - Aldolase

19- Succinate + FAD \leftrightarrow Fumarate + FADH₂

20- Glucose + ATP \rightarrow Glucose-6-phosphate + ADP

21- Catabolic pathways are metabolic pathways that ----- energy, while anabolic pathways are metabolic pathways that ----- energy .

- A- Release, release
- B- Consume, release
- C- Consume, consume
- D- Release, consume
- E- None of the above

Handwritten notes in the top right corner, including the number '10' and some illegible scribbles.

A small, dark, irregular mark or smudge on the left side of the page.