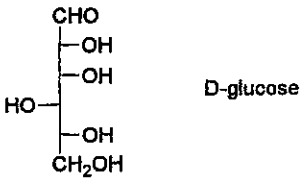
※ 注意：請用 2B 鉛筆作答於答案卡，並先詳閱答案卡上之「畫記說明」。

單選題，每題2分。

1- 2. The structure of D-glucose is shown here.



1. In solution, the sugar predominantly forms a pyranose form. Would you please point out which position of hydroxyl group is UNLIKELY to form a glycosidic bond with another molecule of D-glucose?
(A) C-1 (B) C-3 (C) C-5 (D) C-6

2. When D-glucose forms a glycosidic bond with another molecule of D-glucose, which position will create additional chiral center (or become an asymmetric carbon)?
(A) C-1 (B) C-3 (C) C-5 (D) C-6

3. Sialic acid (also called N-acetylneuraminic acid) is always situated at the ends of oligosaccharide chains. Which of the following descriptions are NOT true?
(A) Influenza virus attaches to the host cells through interactions with sialic acid-containing sugars that are displayed on the host cell surface.
(B) Hyaluronic acid is now widely used for cosmetic and medical purposes. It is a sugar polymer that contains alternating residues of D-glucuronic acid and N-acetylneuraminic acid.
(C) Sialic acid functions as a tag or marker. The plasma membrane of hepatocytes has receptors that specifically bind oligosaccharide chains with galactose residues no longer "protected" by a sialic acid residue.
(D) Newly synthesized erythrocytes have several membrane glycoproteins that contain sialic acids in the terminal ends. When sialic acids are removed during circulation, the corresponding erythrocytes quickly disappear from the bloodstream.

4. Haparin, a highly negatively charged glycosaminoglycan, is used clinically as an anticoagulant. It acts by binding several plasma proteins, including antithrombin III, an inhibitor of blood clotting. The 1:1 binding of heparin to antithrombin III appears to cause a conformational change in the protein that greatly increases its ability to inhibit clotting. What amino acid residues of antithrombin III are likely to interact with heparin?
(A) Asp (B) Ser (C) Asn (D) Glu (E) Lys

5. In the hydrolytic reaction catalyzed by chymotrypsin, a number of residues are involved in the catalysis, such as His 52, Asp 102, Gly193 and Ser 195. Which of the following is true regarding to the reaction mechanism?
(A) Asp102 serves as the general acid/base
(B) His 52 acts as the nucleophile to attack the amide bond at the first stage.
(C) His 52 exists as a protonated form before the occurrence of the catalysis.
(D) The pKa of Ser195 is larger than that of His57.
(E) Asp102 has hydrogen bond interactions with Ser 195

6. Immunity is brought about by a variety of leukocytes. Which type of leukocytes is in charge of production and secretion of antibodies.
(A) macrophages (B) B cells (C) Killer T cells (D) Helper T cells

7. Carbon monoxide (CO) binds to free heme molecules more than 20,000 times better than does O_2, but it binds only about 200 times when the heme is bound in myoglobin. Which of the following explanations is true?
(A) The iron atom in its ferrous (Fe2+) state has five coordination bonds in myoglobin
(B) The distal His, His E7 or His 64, coordinates with the heme iron and thus prevents the binding of CO.
(C) The CO binding is sterically blocked by His E7.
(D) The O_2 binding is enhanced by the proximal His (His F8).

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8. Why do enzymes function as catalyst to speed up reaction rates?
(A) Enzymes are complementary to substrates
(B) Enzymes increase the activation energy.
(C) Enzymes significantly contribute to enthalpy reduction
(D) Enzymes significantly stabilize the transition state
(E) Enzymes do not affect the activation energy

9-10. Prostaglandins are responsible for producing fever and inflammation and its associated pain. Prostaglandins are derived from the 20-carbon fatty acid arachidonic acid in a reaction catalyzed by the enzyme prostaglandin endoperoxide synthase. This enzyme, a cyclooxygenase, uses oxygen to convert arachidonic acid to PGG_2, the immediate precursor of many different prostaglandins. The kinetic data given below are for the reaction catalyzed by prostaglandin endoperoxide synthase.

[Arachidonic acid] (mM)	Rate of formation of PGG_2 (mM/min)	Rate of formation of PGG_2 with 10 mg/mL ibuprofen (mM/min)
1.0	23.5	16.67
2.0	32.2	25.25
3.0	36.9	30.49
5.0	41.8	37.04
7.0	44.0	38.91

9. Which of the following is true?
(A) K_m = 0.59 mM (B) K_m = 5.9 mM (C) V_{max} = 51.5 mM/min (D) V_{max} = 45.1 mM/min

10. Ibuprofen is an inhibitor of prostaglandin endoperoxide synthase. By inhibiting the synthesis of prostaglandins, ibuprofen reduces inflammation and pain. Using the data in the first and third columns of the table, what type of inhibition that ibuprofen exerts on prostaglandin endoperoxide synthase?
(A) Non-competitive inhibition (B) Competitive inhibition (C) Un-competitive inhibition (D) Mixed-type inhibition

11. Which of the following statements is NOT true?
(A) Poly L-glutamate will have alpha-helical conformation at pH 3.
(B) Poly L-glutamate will have alpha-helical conformation at pH 7
(C) Poly L-lysine will adopt alpha-helical conformation at pH 10.
(D) Poly L-lysine will become unordered at pH < 7.
(E) A protein's conformation will be affected by its electrical charges.

12. Which of the following descriptions is NOT true?
(A) The hemoglobin from sickle cells (called hemoglobin S) has altered properties due to a single amino acid change.
(B) Hemoglobin S is often deoxygenated.
(C) The patients suffering from sickle-cell anemia have to avoid vigorous exercise or other stresses on the circulatory system.
(D) In comparison with normal hemoglobins, the Val of hemoglobin S is replaced with Glu in the two β chains. Hemoglobin S therefore has two more negative changes
(E) Bohr effect explains that the binding of H^+ and CO_2 is inversely related to the binding of oxygen.

13-14. The active site of lysozyme contains two amino acid residues essential for catalysis: Glu 35 and Asp 52. Their pKa values of the carboxyl side chains are 5.9 and 4.5, respectively. The pH optimum of lysozyme occurs at pH 5.2.

13. What are the ionization states of the side chains of Glu 35 and Asp 52 at the optimum pH?
(A) Glu 35 (COOH) and Asp 52 (COOH) (B) Glu 35 (COO^-) and Asp 52 (COOH)
(C) Glu 35 (COOH) and Asp 52 (COO^-) (D) Glu 35 (COO^-) and Asp 52 (COO^-)

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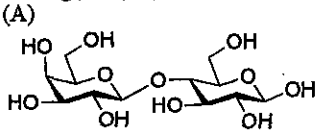
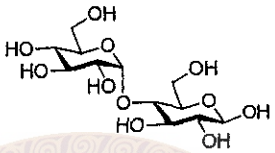
14. At the initial stage of the lysozyme reaction, the glycosidic oxygen (that is to say, the oxygen atom of the glycosidic bond) has to be protonated first by an active-site residue.
Which of the following is true regarding to the active site residue?
(A) The active site residue is Glu 35, serving as the general acid.
(B) The active site residue is Glu 35, serving as the general base.
(C) The active site residue is Asp 52, serving as the general acid.
(D) The active site residue is Asp 52, serving as the general base.

15. Which of the following disaccharides gives negative result in the test of Tollens' reagent (silver ammonia complex ion, $Ag(NH_3)_2^+$)?

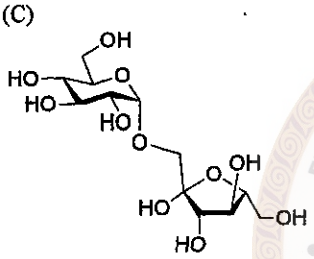
(A)



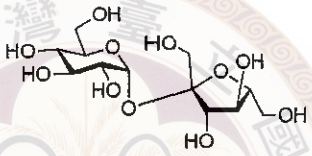
(B)



(C)



(D)



16. If the equilibrium constant for the reaction A $\rightleftharpoons$ B is 0.5, and the initial concentration of B is 10 mM and of A is 20 mM, then
(A) the reaction will proceed in the direction it is written, producing a net increase in [B].
(B) $\Delta G = 0$ and the reaction is at equilibrium.
(C) the reaction will produce energy, which can be used to drive ATP synthesis.
(D) the equilibrium constant for this reaction as written is Keq = [A]/[B].
(E) the reaction will proceed in the reverse direction, producing a net increase in the concentration of A, if a catalyst is added to the reaction mixture.

17. An increase in entropy
(A) is equivalent to an increase in the total bond energies of the reactants.
(B) is an increase in order.
(C) occurs when a glucose solution is diluted.
(D) occurs when a hydrocarbon molecule is transferred from an organic solvent to an aqueous environment.
(E) occurs in the system when 2 amino acids are linked to form a dipeptide.

18. If for a reaction A→B, $\Delta H < 0$ and $\Delta S > 0$, then
(A) the reaction is spontaneous. (B) $\Delta G > 0$. (C) the reaction is endothermic. (D) $\Delta G = 0$.
(E) the disorder in the system will decrease if the reaction proceeds.

19. Which statement in the following is NOT correct?
(A) Because free energy is additive, ΔG of an exergonic reaction can be used to drive an endergonic reaction.
(B) The endergonic and exergonic reactions can be coupled by sharing a common intermediate.
(C) In addition to ATP, there are other compounds that have large free energies of hydrolysis, such as ADP and phosphoenolpyruvate.
(D) The large free energy of hydrolysis of some biomolecules is due to the fact that the hydrolysis products are stabilized by ionization, isomerization or by resonance.
(E) ATP is hydrolyzed with large negative ΔG because it contains high-energy bonds in its molecular structure.

見背面

20. A protein was subjected to N-terminal analysis by Edman degradation. The result is negative, i.e., no PTH-amino acid was found. The probable cause is
(A) the protein sample is not homogeneous.
(B) the N-terminal amino group is blocked.
(C) the N-terminal residue is phosphorylated.
(D) the protein sample contains carbohydrate
(E) none of the above

21. Site-directed mutagenesis is often used to study the functional roles played by a particular residue in a protein. In this approach the residue under study can be changed to which amino acid in order to get a best answer?
(A) tryptophan (B) glycine (C) alanine (D) proline (E) methionine

22. Which statement about a peptide bond in the following is NOT correct?
(A) the majority of peptide bonds in a protein is in *trans* form.
(B) the *cis* peptide bond is very rarely found in a peptide with proline at the C-terminus.
(C) the peptide bond has partial double bond character and therefore cannot rotate.
(D) the peptide bond contains a dipole moment.
(E) the *trans* peptide is more stable than the *cis* form.

23. Which of the following statements about mass spectrometry is NOT correct?
(A) it can be used to determine the amino acid sequence of peptides.
(B) it can be used for the identification of a protein from the masses of its peptide fragments.
(C) it can determine a protein's molecular mass at much higher accuracy and sensitivity than the conventional methods such as SDS-PAGE and gel-filtration.
(D) any molecules or ions can be analyzed by mass spectrometry only when they carry positive charges.
(E) it can be used to characterize a protein's modifications.

24. Which of the following statements about protein structure and folding is NOT correct?
(A) native proteins most likely have hydrophobic cores and the hydrophilic residues are on the surface.
(B) left-handed alpha-helices are sometimes found in natural proteins..
(C) large proteins synthesized in the cell usually fold to their native conformations without assistance of other proteins.
(D) prions are misfolded infectious proteins transformed from normal cellular proteins.
(E) the major forces to stabilize a protein's structure include van der Waals force, hydrogen bonds and hydrophobic interactions.

25. Which of the following about posttranslational modifications of proteins is NOT correct?
(A) The hydroxyl groups of Ser, Thr and Tyr can be phosphorylated and glycosylated in some proteins.
(B) Disulfide bonds between cysteine residues can be formed in proteins to be secreted.
(C) Methionine side chains may be oxidized in air without enzymatic catalysis.
(D) Long-chain fatty acyl groups may be attached to proteins as membrane anchors.
(E) Carbohydrate side chains of glycoproteins are attached during or after synthesis of the polypeptide.

26. Which of these statements about sterol or cholesterol is **false**?
(A) All sterols share a fused-ring structure with four hydrocarbon rings. Although cholesterol, the major sterol in animal tissues, is made up of almost entirely hydrocarbons, it contains one polar group, a hydroxyl; thus it is classified as an amphipathic molecule.
(B) Sterol lipids are common in human cell plasma membranes.
(C) The structure of 27-carbon cholesterol suggests a complex biosynthetic pathway, but cholesterol is not required in the mammalian diet, as all cells can synthesize it from simple precursors, acetate.
(D) The isoprene units are the essential intermediates in the biosynthesis of cholesterol.
(E) Esterification converts cholesterol to an even more hydrophobic form for storage and transport. Cholesteryl esters are formed in the liver through the action of lecithin-cholesterol acyl transferase (LCAT).

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27. Which one of the following statements about the melting temperatures of the fatty acids is **correct**?
(1) $18:1^{\Delta 9} < 18:2^{\Delta 9,12}$ (2) $18:1^{\Delta 9} > 16:1^{\Delta 9}$ (3) 18:0 < 16:0 (4) 18:0 > $18:1^{\Delta 9}$ (5) 24:0 > 18:0 (6) 20:0 < 16:0

(A) 1, 2, and 4 only (B) 2, 4, and 5 only (C) 3, 4, and 5 only (D) 3 and 5 only (E) 2 and 4 only

28. Which of the following statements about membrane lipids is **false**?
(A) Glycerophospholipids (phosphoglycerides) are common constituents of cellular membranes. They have a glycerol backbone. The hydroxyls at C-1 and C-2 of glycerol are linked with fatty acids through ester bonds.
(B) In phosphatidate, the C-3 hydroxyl of glycerol backbone is esterified to phosphate.
(C) The fluidity of a lipid bilayer will be increased by increasing temperature.
(D) The membrane bilayer is stabilized by covalent bonds between neighboring phospholipid molecules.
(E) Triacylglycerols are not commonly found in membranes.

29. Which of these statements about the membrane proteins is **true**?
(A) An integral membrane protein can be extracted with a chelating agent that removes divalent cations.
(B) Peripheral membrane proteins are generally noncovalently bound to membrane lipids.
(C) Carbohydrate moieties of membrane glycoproteins are linked to the intracellular domain of the proteins.
(D) Peripheral membrane proteins may have functional units on both sides of the membrane.
(E) Glycosylphosphatidylinositols, abbreviated GPI, are complex glycolipids that attach some proteins to the cytosolic surface of the plasma membrane.

30. Which of the following statements about hydropathy plot is **false**?
(A) A hydropathy plot for a protein is a graphical representation of the average "hydropathy" values of contiguous groups of amino acid R-groups in a protein.
(B) A hydropathy plot can be used to predict whether a given protein sequence contains membrane-spanning segments.
(C) Integral membrane proteins usually contain one or more regions with a high hydropathy index.
(D) A hydropathy plot can be used to deduce the quaternary structure of a membrane protein.
(E) It is possible to get hydrophobic areas for proteins that are not membrane associated in a hydropathy plot, as water soluble proteins have hydrophobic interiors.

31. Which of these statements about solute transport across a membrane is **false**?
(A) There are two main types of active transport: primary active transport and secondary active transport. In primary active transport, energy from hydrolysis of ATP is directly coupled to the movement of a specific substance across a membrane independent of any other species.
(B) Secondary active transport can move materials against the concentration gradient. It does not use ATP directly but takes advantage of a previously existing concentration gradient.
(C) Passive transport always operates from regions of greater concentration of the diffusing solute to regions of lesser concentration. No external source of energy is required.
(D) There are two very broad categories of transporters: carriers and channels. Channels typically show higher stereospecificity than carriers in binding their substrates.
(E) In facilitated diffusion, a specific membrane protein lowers the activation energy for movement of the solute through the membrane.

32. Which of the following statements about fatty acid oxidation is **false**?
(A) In mammals, β oxidation of fatty acids occurs in both mitochondria and peroxisomes, whereas in plant cells, the major site of β oxidation is not mitochondria but peroxisomes.
(B) A difference between mitochondrial and peroxisomal β oxidation in mammals is in the specificity for fatty acyl–CoAs; the peroxisomal system is much more active on very-long chain fatty acids and on branched-chain fatty acids.
(C) In β oxidation of the common unsaturated fatty acids, an isomerase is required to isomerize the *trans* form of enoyl-CoA to the *cis* form.
(D) The presence of a methyl group on the carbon of a fatty acid makes β oxidation impossible, and these branched fatty acids are oxidized in peroxisomes of animal cells by α oxidation.
(E) There is another pathway in some species, including vertebrates, that involves oxidation of the ω carbon. In the ω oxidation pathway, the resulting dicarboxylic acid can enter the β oxidation pathway to be shortened at both ends of the molecule.

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33. Which of the following statements about fatty acid oxidation is **false**?
(A) In β oxidation of fatty acids, activation of the free fatty acid requires the equivalent of two ATPs.
(B) Oxidation of 1 mol of palmitate (a 16-carbon saturated fatty acid; 16:0) by the β-oxidation pathway yields 8 mol of acetyl-CoA and 8 mol of $FADH_2$ and NADH.
(C) During β oxidation of fatty acids, H_2O_2 is produced in peroxisomes but not in mitochondria.
(D) The carbon atoms from a fatty acid with an odd number of carbons (not less than 5 carbons) will enter the citric acid cycle as acetyl-CoA and succinyl-CoA.
(E) The presence of adipate in blood or urine can be monitored to determine the degree of ω oxidation in an individual.

34. Which of the following statements is **false** in the transport of fatty acids from the cytoplasm to the mitochondrial matrix?
(A) The enzymes of fatty acid oxidation in animal cells are located in the mitochondrial matrix. The fatty acids with chain lengths of 12 or fewer carbons enter mitochondria without the help of membrane transporters.
(B) Fatty acids with 14 or more carbons cannot pass directly through the mitochondrial membranes. The carnitine shuttle is responsible for transferring these long-chain fatty acids across the barrier of the mitochondrial membrane to gain access to the enzymes of β oxidation.
(C) Acyl-carnitines can cross the mitochondrial inner membrane, but acyl-CoAs do not.
(D) The carnitine-mediated entry process is the rate limiting step for oxidation of long-chain fatty acids in mitochondria and is a regulation point.
(E) Fatty acids cannot be oxidized unless they are in the acyl-carnitine form.

35. Which of the following statements concerning the biosynthesis of fatty acids is **false**?
(A) *Fatty acid synthesis occurs in the cytosol of many organisms but in the chloroplasts of plants.*
(B) Biosynthesis of fatty acids requires the participation of a three-carbon intermediate, malonyl-CoA, which is formed via the reaction catalyzed by acetyl-CoA carboxylase.
(C) In nonphotosynthetic eukaryotes, nearly all the acetyl-CoA used in fatty acid synthesis is formed in mitochondria, and the acetyl group used in fatty acid synthesis is shuttled out of mitochondria as citrate.
(D) If malonyl-CoA is synthesized from $^{14}CO_2$ and unlabeled acetyl-CoA, and the labeled product is then used for fatty acid synthesis, the final product (fatty acid) will have radioactive carbon in every even-numbered C-atom.
(E) Fatty acid biosynthesis uses NADPH exclusively, whereas β oxidation uses NAD^+ exclusively.

36. Glutamate and glutamine play critical roles in nitrogen metabolism, acting as a kind of general collection point for amino groups. Which of the following statements is **false**?
(A) Free ammonia is produced in many extrahepatic tissues. The free ammonia produced in these tissues is combined with α-ketoglutarate to yield glutamate by the action of glutamate synthase. Glutamate is moved from the extrahepatic tissues to the liver, where the amino group is released.
(B) The reaction of the combination of ammonia with glutamate to form glutamine requires ATP. γ-Glutamyl phosphate is an intermediate in the reaction.
(C) In liver mitochondria, glutaminase catalyzes the reaction to release the amino group from glutamine; the products are glutamate and ammonia.
(D) NH_4^+ generated in liver mitochondria is immediately used, together with CO_2 (as HCO_3^-), to form carbamoyl phosphate. This ATP-dependent reaction is catalyzed by carbamoyl phosphate synthetase I.
(E) Alanine can play the role to transport ammonia from skeletal muscles to the liver. In muscles, glutamate can transfer its α-amino group to pyruvate to form alanine by alanine aminotransferase.

37. Which of the following statements in the reactions involved in the production of urea from NH_4^+ via the urea cycle is **false**?
(A) The coenzyme involved in a transaminase reaction is pyridoxal phosphate (PLP).
(B) Glutamate is metabolically converted to α-ketoglutarate and NH_4^+ by a process described as oxidative deamination.
(C) Aspartate, ATP, and malate are involved in the production of urea from NH_4^+ via the urea cycle.
(D) Aspartate directly donates a nitrogen atom for the formation of urea during the urea cycle.
(E) The activity of urea cycle is regulated by the rates of synthesis of the four urea cycle enzymes and carbamoyl phosphate synthetase I.

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38. Which of the following statements in the enzyme cofactors involved in one-carbon transfer reactions is **false**?
(A) Tetrahydrofolate, *S*-adenosylmethionine, and biotin are important cofactors involved in the reactions of one-carbon transfers.
(B) *S*-Adenosylmethionine is synthesized from ATP and methionine.
(C) The methyl group donated from N^5-methyltetrahydrofolate is more reactive than that donated from *S*-adenosylmethionine.
(D) Acetyl-CoA carboxylase, which catalyzes the formation of malonyl-CoA from acetyl-CoA, contains a biotin prosthetic group.
(E) In the activated-methyl cycle for the synthesis of methionine and *S*-adenosylmethionine, homocysteine is converted to methionine through the donation of the methyl group from N^5-methyltetrahydrofolate.

39. Which one of the following statements about biosynthesis of nucleotides is **false**?
(A) In the *de novo* pathways for the synthesis of nucleotides, the free bases are synthesized first and then attached to ribose.
(B) Phosphoribosyl pyrophosphate (PRPP) is important in the *de novo* and salvage pathways for the synthesis of nucleotides, and the ribose is retained in the product nucleotide.
(C) Glutamine is the most important source of amino groups in the synthetic pathways for nucleotides.
(D) In animals, the carbamoyl phosphate required in urea synthesis is made in mitochondria by carbamoyl phosphate synthetase I, whereas the carbamoyl phosphate required in pyrimidine biosynthesis is made in the cytosol by a different form of the enzyme, carbamoyl phosphate synthetase II.
(E) Free purines are in large part salvaged and reused to make nucleotides. Free guanine and hypoxanthine (the deamination product of adenine) are salvaged in the same way by hypoxanthine-guanine phosphoribosyltransferase.

40. Which of the following statements about the reactions involved in the synthesis of deoxyribonucleotides is **false**?
(A) Deoxyribonucleotides are derived from the corresponding ribonucleotides by direct reduction at the 2'-carbon atom of the D-ribose to form the 2'-deoxy derivative.
(B) Formation of deoxyribonucleotides is catalyzed by ribonucleotide reductase, in which its substrates are ribonucleoside diphosphates.
(C) Glutathione serves as a reducing agent for glutaredoxin in deoxyribonucleotide synthesis.
(D) Ribonucleotide reductase is notable in that its reaction involves free radicals in biochemical transformations.
(E) The immediate precursor of thymidylate (dTMP) is dUMP. The conversion of dUMP to dTMP is a reaction of deamination.

41. The function of the eukaryotic DNA replication factor PCNA (*p*roliferating *c*ell *n*uclear *a*ntigen) is similar to that of the β-subunit of bacterial DNA polymerase III in that it:
(A) facilitates replication of telomeres. (B) has a $3' \rightarrow 5'$ proofreading activity. (C) participates in DNA repair.
(D) forms a circular sliding clamp to increase the processivity of replication.
(E) increases the speed but not the processivity of the replication complex.

42. The role of the Dam methylase is to:
(A) add a methyl group to uracil, converting it to thymine.
(B) remove a methyl group from thymine.
(C) remove a mismatched nucleotide from the template strand.
(D) replace a mismatched nucleotide with the correct one.
(E) modify the template strand for recognition by repair systems.

43. Which one of the following statements about *E. coli* RNA polymerase (core enzyme) is *false*?
(A) It can start new chains de novo or elongate old ones.
(B) It produces an RNA polymer that begins with a 5'-triphosphate.
(C) It has no catalytic activity unless the sigma factor is bound.
(D) Its activity is blocked by rifampicin.
(E) Its RNA product will hybridize with the DNA template.

見背面

44. The 5′-terminal cap structure of eukaryotic mRNAs is a(n):
(A) 7-methylguanosine joined to the mRNA via a 5′→3′ diphosphate linkage.
(B) 7-methylcytosine joined to the mRNA via a 2′,3′-cyclic linkage.
(C) 7-methylguanosine joined to the mRNA via a 5′→5′ triphosphate linkage.
(D) N^6-methyladenosine joined to the mRNA via a 5′→5′ phosphodiester bond.
(E) O^6-methylguanosine joined to the mRNA via a 5′→5′ triphosphate linkage.

45. Differential RNA processing may result in:
(A) a shift in the ratio of mRNA produced from two adjacent genes.
(B) inversion of certain exons in the final mRNA.
(C) attachment of the poly(A) tail to the 5′ end of an mRNA.
(D) the production of the same protein from two different genes.
(E) the production of two distinct proteins from a single gene.

46. Formation of the ribosomal initiation complex for bacterial protein synthesis does *not* require:
(A) mRNA. (B) EF-Tu. (C) formylmethionyl $tRNA^{fMet}$. (D) GTP. (E) initiation factor 2 (IF-2).

47. Ubiquitin-mediated protein degradation is a complex process, and many of the signals remain unknown. One known signal involves recognition of amino acids in a processed protein that are either stabilizing (Ala, Gly, Met, Ser, etc.) or destabilizing (Arg, Asp, Leu, Lys, Phe, etc.), and are located at:
(A) a helix-turn-helix motif in the protein. (B) a zinc finger structure in the protein.
(C) a lysine-containing target sequence in the protein. (D) the amino-terminus of the protein.
(E) the carboxy-terminus of the protein.

48. The tryptophan operon of *E. coli* is repressed by tryptophan added to the growth medium. The tryptophan repressor probably:
(A) is a DNA sequence.
(B) binds to RNA polymerase when tryptophan is present.
(C) binds to the *trp* operator in the absence of tryptophan.
(D) binds to the *trp* operator in the presence of tryptophan.
(E) is an attenuator.

49. Protein structural motifs often have general functions in common. Which one of the following motifs is known to be involved in protein dimer formation, but not in direct protein-DNA interactions?
(A) β-barrel (B) helix-turn-helix (C) homeodomain (D) leucine zipper (E) zinc finger

50. The availability of a number of human proteins has led to a black market in the sale of the following proteins to athletes:
(A) Erythropoietin (EPO) for increasing the number of red blood cells. (B) Steroids for muscle development.
(C) Human growth hormone (HGH) for body building. (D) Both EPO and HGH. (E) All three of these hormones.

試題隨卷繳回