BIOCHEM

PAST PAPERS

MID 2020/2021

DONE BY:

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1-Which of the following Does NOT represent a peptide that might be present in your body?

a. Arg-Pro-Pro-Gly-Phe-Ser-Pro-Phe-Arg

b. Glu-His-Pro

c. Asp-Arg-Val-Tyr-Ie-His-Pro-Phe

d. Mor-His-Pro

e. Glu-Cys-Gly

2-You studied the promoter region of the gene Ahramerica using the luciferase reporter assay. Its length is 1000 bp (from-1000 to -1 bp, upstream to downstream). You deleted portions of it gradually and measured gene expression compared to a positive control that has 100% expression and negative control of 5% expression. (full promoter = 85%; from - 800 to -1 bp = 150%; from -600 to -1 bp = 67%; from -400 to -1 bp = 63%; from -200 to -1 = 80%; from -50 to - 1 = 20%; from -50 to -1 = 7%). Based on the following results, This is NOT a correct interpretation:

a. Region - 800 to -600 bp contains an activating region

b. Region -1000 to -800 bp contains a repressor region

c. Region -600 to -400 contains a repressor region

d. Region - 400 to -200 bp contains a repressor region

e. Region -200 to -50 bp contains an activating region

3-All of the following eicosanoids contain ring structure EXCEPT:

a. Thromboxane

b. Prostaglandin E2

c. Prostaglandin H2

d. Prostacyclin

e. Leukotriene

4-One of the following is correctly matched with its structure.

a. oleic acid 18:2▲9,12

b. palmitoleic acid 16:2▲9,12

c. arachidonic acid 20:2▲9,12

d. palmitic acid 18:2▲9,12

e. linolenic acid 18:3▲9,12,15

5-This particular advantage of plasmids makes them favorable vectors for the production of large amounts of a recombinant human protein in bacteria

a. They carry antibiotic-resistance genes

b. The promoter they contain is human

c. They are small

d. They can be replicated in bacterial cells

e. They are bacterial in nature

6-You have created both a genomic DNA library and a cDNA library from skin stem cells and from differentiated skin cells by fragmenting the DNA using the same restriction enzyme. What would you expect?

a. The cDNA libraries will be identical

b. A CDNA library cannot be created from differentiated cells

c. A genomic library cannot be created from stem cells

d. The genomic libraries will be identical

e. All libraries will be identical to each other

7-Cholesterol CANNOT be used to synthesize:

a. Bile acids

b. Progesterone

c. Cardiolipin

d. Estrogen

e. Vitamin D

8-Which of the following is an oxidized sugar?

a. Sucrose

b. Glucuronate

c. Sorbitol

d. Fructose

e. Ribose

9-19 out of the 20 standard amino acids are chiral. Accordingly, which amino acid(s) out of the following has/have diastereomers?

a. Threonine
b. Alanine
c. Isoleucine
d. A and C
e. A and B

10-The hetero-polysaccharides with sulfated sugars, amino sugars and/or oxidized sugars that are mainly derived of glucose and galactose and are found in extracellular matrix are:

a. Cellulose

b. Chitin

c. Glycosaminoglycans

d. Dextran

e. Pectin

11-Using a fluorescent-based DNA microarray, a computer-generated yellow color means

a. Expression is higher in one sample versus the other

b. There is expression but no cDNA in the sample

c. There is an equal expression in both samples

d. There is failed binding of cDNA to the attached probes

e. There is no expression in either sample

12-You want to turn a solution containing X moles of Ca(OH)2 into a buffer solution. Which of the following should you add?

a. 2X moles of acetic acid

b. X/2 moles of acetic acid

c. 2X moles of HCL

d. 3X moles of acetic acid

e. X moles of H2SO4

13-Using fluorescent-based DNA sequencing, an insertion mutation in both alleles results in the following

a. Insertion of a new peak and change of color of all subsequent peaks

b. Insertion of a new peak and shift of all other peaks to the right

c. Nothing happens

d. The disappearance of a peak representing the site of insertion

e. The presence of an overlapping peak representing the site of insertion

14-More CO2 is exhaled when:

a. Protein buffer system is activated

b. The cytosolic pH decreases

c. The pH of the blood increases

d. The pH of the blood decreases

e. The cytosolic pH increases

15-Which of the following does NOT contain sphingosine:

a. Phosphatidyl choline

b. Globoside

c. Sphingomyelin

d. Ceramide

e. Galacto-cerebroside

16-What is the importance of the CRISPR part of the CRISPR/Cas9 system?

a. It cleaves bacteriophage DNA

b. It activates Cas9 enzyme

c. It contains molecular components of Cas9

d. It prevents bacteriophage entry into the cells

e. It activates the DNA repair system

17-In next-generation sequencing, when the incorporated nucleotide is activated and lights up, the other unincorporated nucleotides do not light up because

a. They are linked to the solid platform and cannot be activated

b. They cannot be activated

c. They light up but faintly

d. They are removed after the addition of the right one

e. They light up but at a different wavelength

18-In classic, old-fashioned, radioactive-based Sagner DNA sequencing, a substrate does not allow the addition of another deoxyribonucleotide because

a. It is missing a (-OH) group at carbon 3 of the sugar

b. It is a monophosphate

c. It is missing a (-OH) group at carbon 2 of the sugar

d. It needs to be activated

e. It is a ribonucleoside

19-The buffer system that provides the highest extracellular capacity is:

a. Protein

b. Bicarbonate carbonic acid

c. Albumin

d. Phosphate

e. Hemoglobin

20-Why specifically are human proteins expressed in yeast instead of bacteria?

a. Yeast cells grow faster than bacterial cells

b. Yeast cells are larger and can handle higher amounts of proteins than bacterial cells

c. Yeast cells are affected by antibiotics like bacterial cells

d. Proteins are folded and modified just like in human cells

e. Larger vectors can be inserted into them

21-The residues of the following disaccharide are connected by a beta linkage:

a. Raffinose

b. Pectin

c. Maltose

d. Sucrose

e. Lactose

22-Ether bond is found in.

a. sphingomyelin.

b.cerbroside.

c. lecithin.

d. phosphatidyl serine.

e. plasmalogen

23-Calculate the pH of a solution prepared by dissolving 600 mg of monoprotic acid in 10 ml of 0.5 M solution of NaOH. pka of the acid is 7.0 (M.W of the acid is 100).

a. 8.0

b.7.7

c. 6.5

d. 7.0

e. 6.7

24-Earlier detection of amplified DNA by SYBR-green-based realtime PCR normally depends on

a. The concentration of the substrates

b. The amount of SYBR green added at the start of the reaction

c. The amount of starting material of DNA sample

d. The activity of the DNA polymerase enzyme

e. The optimal temperature of SYBR green detection

25-In a hospital laboratory, a 100 ml sample of gastric HCl juice, obtained several hours after a meal, was titrated with 0.2 M NaOH to neutrality; 50 mL of NaOH was required. Assuming that no buffers were present, what was the pH of the gastric juice?

a. 7.00

b. 1.05

c. 1.00

d. 13.00

e. 0.40

26-The best technique to discover the expression of a novel gene is

a. Protein tagging

b. DNA sequencing

C. DNA microarray

d. PCR

e. RNA sequencing

27-During gene editing by the CRISPR/Cas9 system, the insertion/deletion mutations (indels) are created by

a. The guide RNA (ORNA)

b. The CRISPR part of the system

c. Homology-directed DNA repair system

d. The non-homologous end joining DNA repair system

e. The Cas9 part of the system

28-The type of DNA polymerase used in PCR is isolated from this bacterial species

a. Acidophilic

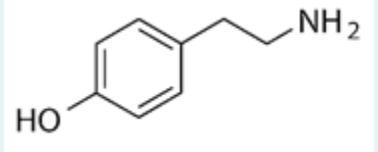
b. Thermophilic

c. Halophilic

d. Extremophilic

e. Metallophilic

29-The following structure represents a molecule that



a. Can produce Epinephrine

b. Cannot be considered an amino acid

c. Can produce Serotonin

d. Is produced by hydroxylation of phenylalanine

e. Is produced by decarboxylation of Histidine

30-In PCR, the annealing temperature changes per reaction in order to

a. Allow for the best primer-binding condition

b. Activate the deoxyribonucleotides

c. Activate the DNA polymerase enzyme

d. Reach the optimal temperature of the DNA polymerase

e. Reach the optimal temperature for DNA denaturation depending on its size and GC content

31- The storage form of sugars in animal cells is:

a. Glycogen

b. Cellulose

c. Amylose

d. Chitin

e. Pectin

32- The amino acid that provides proteins with the greatest buffering capacity at physiological pH is:

a. Glutamate

b. Histidine

c. Arginine

d. Asparagine

e. Aspartate

33- The bond between fatty acids and glycerol in triacylglycerol is a/an:

a. Ester bond

b. Alpha-1,4 bond

c. Peptide bond

d. Glycosidic bond

e. Amide bond

34- It is difficult to use a restriction enzyme that cuts (shown as *) within one of these restriction sites for cloning purposes

a. GCA*TGC

b. GCGCGCG*C

c. *AAAATTTT

d. AGC*T

e. C*GCG

35- Using radioactive-based DNA microarray, comparative expression cannot be done on the same slide (the solid platform) because

a. Radioactivity has a low level of detection

b. Radioactivity has no distinct color

c. There is a lower hybridization capability of glass slides

d. The amount of probes on the slide is very little to handle two samples

e. Using two labeled samples means high radioactivity and this is unhealthy

36- The sugar that does NOT produce a mirror in Tollen's test is:

a. Sucrose

b. Maltose

c. Lactose

d. Maltose

e. Galactose

37- You have studied the possible interaction between two proteins, dumbless and smartful. Dubmless has two domains X and Y. Smartful has two domains: A and B. You used the yeast two-hybrid system approach expressing different domain/protein combinations. You generated the following results (dumbless + smartful = blue colonies; A + X = blue colonies; A + Y = blue colonies; B + X = white colonies; B + y = white colonies). What is your interpretation?

a. Domain B interacts with both domains X and Y

b. Domain A interacts with both domains X and Y

c. The two proteins do not really interact with each other

d. Domain B interacts with X but not Y

e. Domain A interacts with X but not Y

38- In gel electrophoresis, you have a sample of an amino acid where pkal (COOH of backbone) = 3 and pka2 (NH3+ of backbone) = 9. At which pH value will the sample be moving toward the anode (+ve)?

a. 7.4

b. Cannot be predicted from the given information

c. 2.3

d. 6

e.3.4

39- Galactose and mannose are:

a. Constitutional isomers

b. Diastereomers

c. Epimers and diasteromers

d. Enantiomers

e. Epimers

40- An acid was completely titrated with 3 equivalents of a strong base. The following statement describes this acid:

a. The acid has to be strong

b. The acid releases its last proton at the lowest pH during titration

c. The pH at the end of titration is lower than that at the beginning of the process

d. The titration of the last proton produces a relatively more basic buffer than that of other protons

e. pka1 is the largest

ANSWERS

1-D	6-D	11-C	16-C(not sure)	21-E	26-E	31-A	36-A
2-C	7-C	12-D	17-D	22-E	27-D	32-B	37-B
3-E	8-B	13-B	18-A	23-B	28-B	33-A	38-A
4-E	9-D	14-D	19-B	24-C	29-B	34-A	39-B
5-D	10-C	15-A	20-D	25-C	30-A	35-B(not sure)	40-D

NOTE::The questions I wrote (not sure) beside them may be deleted because there are some questions which were deleted in the midterm exam

BELIEVE IN ALLAH

THEN

BELIEVE IN YOURSELF

YOU CAN DO IT,

ACHIEVE IT

AND REALIZE YOUR DREAM

وبنتمنالكم كل التوفيق <3