Assiut University

Faculty of Science

Zoology Department

Course name: Genetic Engineering

Course code: (314Z)

Time: Three hours

June 2021

I-Choose the correct answer (50 marks, one mark for each):

1- A recombinant plasmid gets inside a bacterial cell by:

(A) Hybridization.
(B) Transformation
(C) Radiation
(D) Recombination

2- Which of the following characteristic is not present in a plasmid on a general basis?

(A) Multiple cloning site (MCS)
(B) Origin of replication (ori)
(C) Antibiotic resistance gene
(D) Beta galactose genes

3- The restriction endonuclease is having a defense mechanism in the bacterial system against foreign DNA such as viruses. But how it is able to protect its own DNA?

(A) By methylation of bacterial DNA by restriction enzyme
(B) By methylation of foreign DNA by restriction enzyme
(C) By phosphorylation of bacterial DNA by restriction enzyme
(D) By phosphorylation of foreign DNA by restriction enzyme

4- Type II restriction enzyme cuts the sequence in the following way:

(A) Within the recognition sequence
(B) At 100-1000 nucleotides away from the recognition sequence
(C) At 27-30 nucleotides away from the recognition sequence
(D) It cuts randomly

5- Electroporation is also used for taking up the DNA by the cells. It constitutes of:

(A) inserting the DNA into the cells via an electric shock
(B) increased efficiency than both natural and chemical methods
(C) causing the least amount of damage in comparison to other methods
(D) decreased efficiency than both natural and chemical methods

6- It is required to distinguish between the cells that have taken up the vector and that have not. It is done by using:

(A) multiple cloning site
(B) origin of replication
(C) high copy number
(D) selectable marker

7- The cell in which the recombinant molecules are propagated is termed as:

(A) host
(B) vector
(C) plasmid
(D) carrier

8- In order to insert a foreign gene into a plasmid, both must:

(A) have identical DNA sequences
(B) originate from the same type of cell
(C) be cut by the same restriction enzyme
(D) be of the same length

9- Which type of restriction enzymes does not usually require ATP?

(A) Type I
(B) Type II
(C) Type III
(D) Type IV

10- A plasmid is:

(A) is a circular DNA molecule
(B) always contains an origin of replication
(C) usually contains one or more restriction sites
(D) all of the above

11- The unpaired nucleotides produced by the action of restriction enzymes are referred to have:

(A) sticky ends
(B) single strands
(C) restriction fragments
(D) ligases

12- In the laboratory, recombinant plasmids are commonly introduced into bacterial cells by:

(A) electrophoresis – a gentle low-voltage gradient draws the DNA into the cell
(B) infection with a bacteriophage that carries the plasmid
(C) microinjection
(D) transformation – heat shock of the cells incubated with plasmid DNA in the presence of $CaCl_2$

13- Telomeric sequences (TEL) are found in:

(A) HAC
(B) YAC
(C) BAC
(D) PAC

14- Cosmids have the *Cos* site of:

(A) YAC
(B) Lambda
(C) Plasmid
(D) ML_3

15- Which of the following statements is true regarding DNA cloning?

(A) DNA ligase recognizes one or a few target sequences in DNA before cutting occurs
(B) DNA target sequences are recognized and cut by restriction enzymes
(C) Plasmids are used often because they are extremely complex
(D) Recombinant DNA is formed when bacterial cells reproduce asexually

16- Problems in obtaining large amounts of proteins encoded by recombinant genes can often be overcome by using:

(A) BACS
(B) expression vectors
(C) YACS
(D) all of these

17- Which of the following enzymes is used to covalently bond foreign DNA to a vector plasmid?

(A) DNA polymerase
(B) Restriction endonuclease
(C) DNA ligase
(D) DNA helicase

18- When the viral genome gets inserted into bacterial host it is termed as:

(A) replication
(B) lysogenic cycle
(C) lytic cycle
(D) capsid formation

19- Plasmids which are maintained as limited number of copies per cell are known as:

(E) stringent plasmids

(F) relaxed plasmids

(G) cryptic plasmids

(H) all of these

20- After transformation by electric shock, the holes in cell membrane:

(A) Cell membrane is damaged completely

(B) Holes are Kept opened

(C) Closed by plasmid aggregates

(D) Closed by the cell's membrane-repair mechanisms

21- What is a cloning vector?

(A) The DNA probe used to locate a particular gene in the genome

(B) An agent such as plasmid, used to transfer DNA from an in vitro solution into a living cell

(C) The laboratory apparatus used to clone genes

(D) An enzyme that cuts DNA into restriction fragments

22- BACs contain F factor which corresponds to:

(A) Selectable marker

(B) Restriction sites

(C) Origin of replication

(D) *COS* site

23- What is DICER?

(A) An enzyme that breaks long strands of double-stranded RNA into siRNA

(B) An enzyme that breaks long strands of single-stranded DNA into siRNA

(C) An enzyme that inactivates mRNA after siRNA binds to it

(D) An enzyme that takes siRNA and makes it into mRNA

24- DNA contains some palindromic sequences which:

(A) Mark the site for the formation of replication forks

(B) Direct DNA polymerase to turn back to replicate the other strand

(C) Are recognized by restriction enzymes

(D) Are found only in bacterial DNA

25- Suppose a restriction enzyme recognizes the six base sequences:

AAGCTT

TTCGAA

In a double strand of DNA, between which two nucleotides on each strand would the enzyme have to cut to produce a fragment with sticky ends that are four bases long?

(A) GC

(B) CT

(C) AA

(D) AG

26- Factors affecting vector efficiency include:

(A) Small sizes

(B) Mobility between cells

(C) Easy production and detection mechanism

(D) All the above

27- Plasmids were originally defined as:

(A) Extrachromosomal

(B) Chromosomal

(C) Intrachromosomal

(D) None of the above

28- Recent advances made possible by recombinant DNA technology are:

(A) Isolating proteins in large quantities

(B) Making possible mutation identification

(C) Gene transfer between organisms

(D) All of the above

29- The lambda genome can be inserted into the *E. coli* chromosome and is then called:

(A) Yac

(B) Prophage

(C) Bac

(D) Bacterium

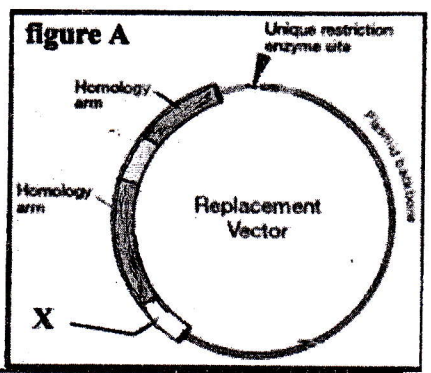
30- During RNA interference process; the molecules resulted after digestion are called:

(A) mRNA

(B) rRNA

(C) siRNAs

(D) dsRNA



31- Figure (A) represents the replacement vector used in gene knock out, X refers to.....

a- Positive selection marker **b- negative selection marker**
c- restriction enzyme site
d- none of the mentioned

32- figure (B) represents homologous recombination in gene knock out, X refers to.....

a- HSVtk **b- neo^r** **c- G418**
d- ganciclovir

33- figure (B) represents homologous recombination in gene knock out, Y refers to.....

a- HSVtk **b- neo^r**

c- mutated locus **d- ganciclovir**

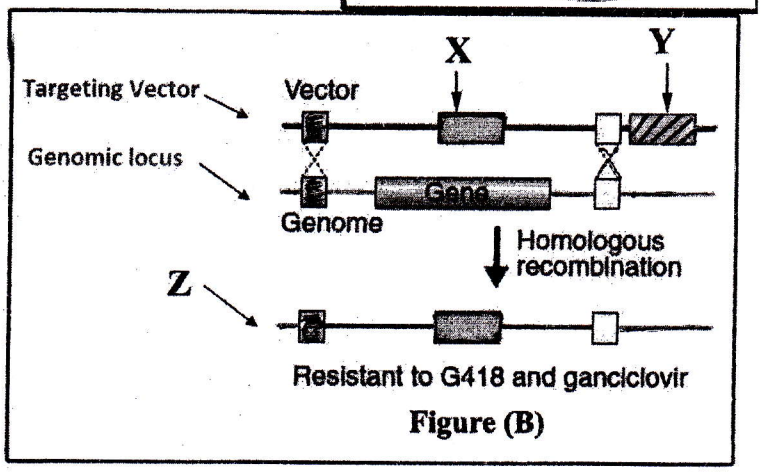
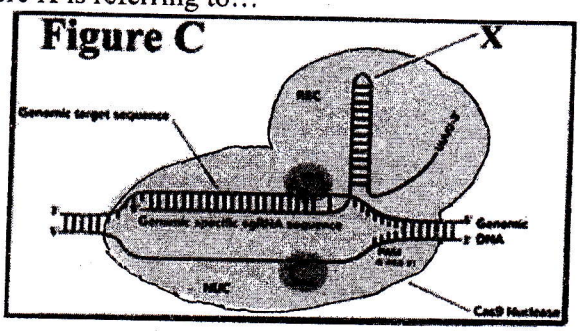


Figure (B)

34- figure (B) represents homologous recombination in gene knock out, Z refers to.....
a- HSVtk b- neo^r c- mutated locus d- none of the mentioned

35- RNA editing means.....
a- altering RNA sequence b- transcriptome diversity
c- adds a poly(A) tail to the 3' end d- a and b

36- Figure (C) represents a CRISPR Cas9 system, where X is referring to...
a- sgRNA b- PAM c- tracrRNA d- spacer



37- The following are none-coding RNA except.....
a- siRNAs b- miRNAs c- mRNAs
d- piRNAs

38- RNA editing takes place in cell .....
a- lysosome b- ribosome c- centrosome
d- none of the mentioned

39- RNA editing is any process, other than..... that results in a change in the sequence of RNA transcript such that it differs from the sequence of the DNA template.
a- Polyadenylation b- capping c- splicing d- translation

40- Production of Human Apolioprotein (ApoB100) and (ApoB40) in liver and intestine, respectively is an example of.....
a- C to U RNA editing b- U to C RNA editing c- A to I RNA editing
d- I to A RNA editing

41- Inosine largely behaves like ..... in RNA folding and by the translation machinery.
a- adenine b- guanosine c- thymine d- cytosine

42- A-to-I RNA editing sites are abundantly occur in....
a- Intronic regions and 3'-UTRs of mRNA b- Intronic regions only
c- exonic regions and 3'-UTRs of mRNA d- exonic regions only

43- ADARs are Adenosine deaminases that acting on .....catalyzing A to I transition
a- dsDNA b- dsRNA c- ssDNA d- ssRNA

44- Long non-coding RNAs (lncRNAs) should be.....
a- >100 nucleotides b- >1000 nucleotides c- <100 nucleotides
d- none of the mentioned

45- The most common positive selection marker in knocking out experiments is the…..

a- neomycin phosphotransferase gene b- neomycin phosphorylase gene

c- neomycin sulfotransferase gene d- none of the mentioned

46- When homologous recombination occurs, the negative selection marker should…….

a- insert into the genome b- cut the genome c- inhibit the genome d- not insert into the genome

47- The herpes simplex virus thymidine kinase gene (HSVtk), is used as……in homologous recombination.

a- Negative selection marker b- positive selection marker
c- restriction enzyme site d- none of the mentioned

48- CRISPR-Cas system class 1 type I is called……

a- CRISPR Cas 9 b- CRISPR Cas3 c- CRISPR Cas 10 d- CRISPR Cas7

49- CRISPR-Cas system class 1 type III is called……

a- CRISPR Cas 9 b- CRISPR Cas3 c- CRISPR Cas 10 d- CRISPR Cas7

50- In modified crispr cas9 system used in gene editing, crRNA and tracrRNA can be combined into ……..

a- sgRNA b- single tracrRNA c- single crRNA d- none of the mentioned

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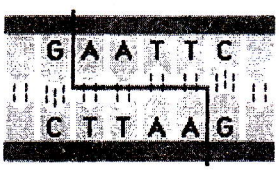
II-Mid-term, oral and activity questions: Choose the correct answer (50 marks, 2 marks for each):

51- The term EcoRI refers to:

(A) specific DNA sequence
(B) specific mutation
(C) bacterial gene
(D) restriction enzyme

52-How many fragments resulted from the cut in the figure?

(A) 1
(B) 2
(C) 3
(D) 4



53-The host cell is destroyed in:

(A) Lambada phage (λ) lytic cycle
(B) Lambada phage (λ) lysogenic cycle
(C) YAC life cycle
(D) Cosmid life cycle

54-The extreme ends of the lambda phage DNA are known as *COS* sites, these ends are:

(A) Double-stranded

(B) Single-stranded

(C) Blunt ends

(D) None of these

55-DICER is considered as:

(A) RNAse III nuclease

(B) DNase

(C) Repressor

(D) None of these

56-A small, dot-like group, or colony, of bacteria can be considered as a mark of:

(A) Bacteria that carry the transferred plasmid after transformation

(B) Bacteria without plasmid

(C) Dead bacteria

(D) None of these

57-Lambada phage (λ) transcription can take place in the left direction or right direction relative to:

(A) *COS* site

(B) Repressor site

(C) Att site

(D) None of these

58-Figure-1 below represents an example for a type of restriction enzyme cut which is called:

(A) Ligase

(B) EcoRI

(C) Blunt cutters

(D) Sticky end cutters

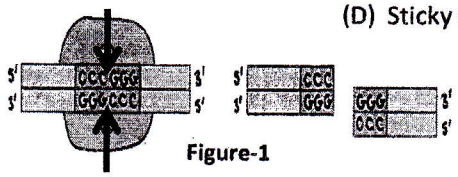


Figure-1

59-Which of the following steps is NOT essential in producing recombinant DNA?

(A) Cut out a piece of DNA from a DNA molecule

(B) Insert a piece of DNA from one organism into the DNA another organism

(C) Use a restriction enzyme to cut DNA and form sticky ends

(D) Read the sequences of bases in a piece of DNA

60-Chemical transformation refers to the methods which use chemicals in order to carry out transformation. Which of the following statements is true with respect to it?

(A) Chemical transformation decreases the efficiency of transformation as compared to natural transformation

(B) The mechanism responsible for it named as 'the heat shock model'

(C) Ice cold calcium solution followed by heat shock is responsible for affecting the efficiency of DNA uptake

(D) Other complex mixtures such as those containing Manganese and hexamine cobalt can't be used to affect the efficiency

61-What is the normal role of restriction endonucleases in bacterial cells?

(A) To degrade the bacterial chromosome into small pieces during replication

(B) To degrade invading phage DNA

(C) To produce RNA primers for replication

(D) All of the above

62-A molecule containing DNA from two different organisms is called:

(A) A plasmid

(B) Recombinant DNA

(C) A polyploid

(D) A hybrid organism

63-Heat shock:

(A) Trap the plasmids inside the cell

(B) Enlarges the pores of the cell

(C) Provides for the death of the cell

(D) All of the above

64- In gene knock out, Since the implanted blastocyst contains two different types of ES cell, the resulting offspring .....

a- Will be chimeric b- will be not chimeric c- will contain original gene

d- all answers are correct

65- There are two homology arms in homologous recombination; the short arm is.....kb.

a- 4-8 b- 5-10 c- 1-1.5 d- 10-15

66- The efficiency of homologous recombination is ..... when there are base pair differences between the donor and recipient DNA.

a- Increased b- stable c- decreased d- not changed

67- Clustered regularly interspaced short palindromic repeats (CRISPR) is found in.....

a- All eukaryotes b- prokaryotes c- some eukaryotes and all prokaryotes

d- some eukaryotes

68- For successful targeting in homologous recombination, the vector must contain at least ..... kb of isogenic DNA homologous with the sequence to be targeted.

a- 5-10 b- 5-15 c- 10-100 d- 20-30

69- The DNA used to construct the targeting vector is preferable to originate from ..... as the ES cells in gene knock out.

a- **The same mouse strain** b- **the same mouse genus** c- **another mouse strain**

d- **another mouse genus**

70- The herpes simplex virus thymidine kinase gene (HSVtk) when expressed in ES cells will .....ES cells expressing this gene in the presence of gancyclovir.

a- **Improve** b- **kill** c- **enhance** d- **none of the mentioned**

71- Pre-RNA processing to be mRNA includes, capping, poly A tail, splicing and.....

a- **RNA polymerization** b- **RNA fragmentation** c- **RNA editing** d- **RNA migration**

72- Base modification RNA editing depends on..... Enzyme

a- **Deaminase** b- **deoxyginase** c- **decarboxylase** d- **dephosphorylase**

73- ..... Is an example of A to I RNA editing

a- **Regulation of Serotonin receptor** b- **production of Apolioprotein (ApoB100)**

c- **production of Apolioprotein (ApoB40)** d- **all answers are correct**

74- Knock outs can be produced by ....

a-removing the gene **b-inducing a mutation that disables its expression**

c- a and b **d- none of the mentioned**

75- Among the applications of CRISPR/Cas9 is.....

a- **Knockout Animal Generation** b- **Knock-in Animal Generation**

c- **Gene Activation / Repression** d- **all answers are correct**

End of questions

Good luck:

Faculty of Science
Zoology & Entomology Department
Population Dynamics
Z 328

كلية العلوم- قسم علم الحيوان والحشرات

أمتحان نهاية الفصل
المقرر: ديناميكية عشائر
رمز المقرر: 328ح
الزمن: ساعتان
يوليو 2021م

الأمتحان فى 4 صفحات

Answer the following questions:

I- Choose the correct answer and also write its letter in the answers table below: (50 marks)

1-…. is a form of competition in which individuals of different species compete for the same resources.
A) Intraspecific competition **B)** Exploitative
C) Apparent **D)** Interspecific competition

2- Which distribution pattern does territoriality produce?
A) Random **B)** Uniform
C) Clumped **D)** None of the above

3-……. ecology deals with the array of ecosystems and their arrangement in a geographic region.
A) Population **B)** Ecosystem
C) Landscape **D)** Both A and B

4- ……. is a release of chemical substances by plant species that inhibit the growth of another.
A) Allelopathy **B)** Autotoxicity
C) Antibiosis **D)** Both A and B

5- ……. **means a community plus the nonliving factors with which it interacts.**
A) Population **B)** Ecosystem
C) Landscape **D)** Both A and B

6- Which one of the following is <u>NOT</u> a density-dependent factor?
A) Competition **B)** Predation
C) Parasitism **D)** None of the above

7-The growth rate of a population slows as intraspecific competition becomes more ……..
A) intense **B)** poor
C) weak **D)** None of the above

8-…… is a relationship between two organisms where one is destroyed while the other is unaffected.
A) Commensalism **B)** Mutualism
C) Amensalism **D)** Parasitism

9- All of the following can improve the abilities of predators except …….
A) poison **B)** webs
C) camouflage **D)** weight

10- What type of survivorship curve do humans have?
A) Type I **B)** Type II
C) Type III **D)** Type IV

11- The statistical study of populations is called
A) density **B)** dispersion
C) demography **D)** fecundity

12- The age distribution of a population reflects its

A) history of survival **B)** reproduction

C) potential for future growth **D)** all of the above

13- .....is an antagonistic association between an organism and the metabolic substances produced by another.

A) Antibiosis **B)** Mutualism

C) Commensalism **D)** None of the above

14- Which of the following factors will affect population growth rates?

A) net emigration **B)** net immigration

C) birth rate **D)** all of the above

15- One of the following is <u>Not</u> related to the others

A) Predators **B)** Prey

C) Pathogens **D)** Parasites

16- What type of population associated with age pyramid which has an extremely broad base?

A) a rapidly expanding population **B)** a stable population

C) a population where the birth rate = the death rate **D)** a population with more males than females

17- .....is a form of competition where there is a winner and a loser.

A) scramble **B)** Exploitative

C) contest **D)** interspecific competition

18- One of the following is <u>Not</u> a result of intraspecific competition.

A) Territoriality **B)** Dispersal

C) Constant loss **D)** Social interactions

19- All factors which limit the growth of populations

A) environmental resistance **B)** Biotic Potential

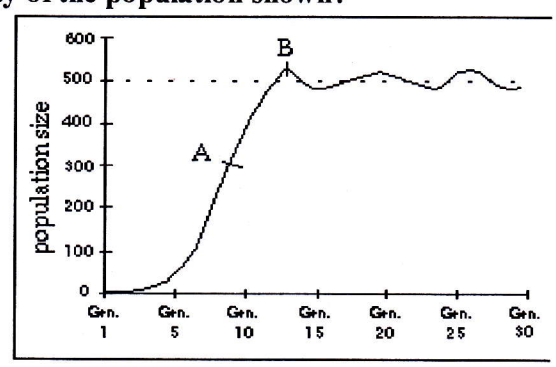
C) population growth **D)** Both A and B

20- The number of individuals per unit area determines the population's

A) survivorship **B)** density

C) mortality **D)** age distribution

21- What is the carrying capacity of the population shown?



A) around 500 **B)** more than 500

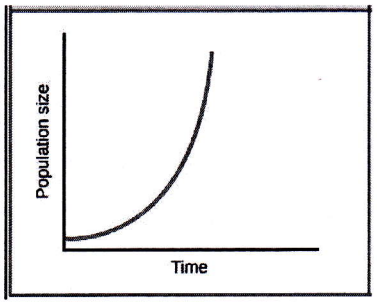
C) less than 500 **D)** around 600

22- What is the characteristic shape of a curve illustrating logistic growth?

A) J-shaped **B)** U-shaped

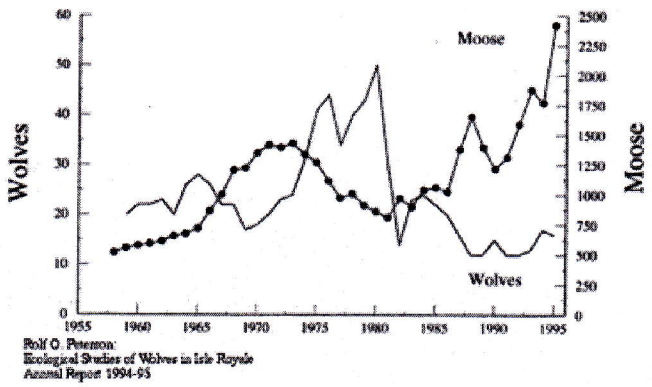
C) S-shaped **D)** L-shaped

23- What type of growth model is this?



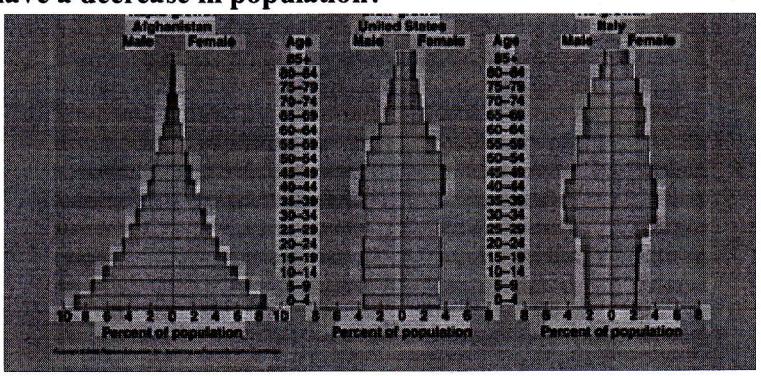
A) exponential growth model
B) logistic growth model
C) Type I curve
D) Type III curve

24- What happened to the wolf population between 1980 and 1982?



A) it increased rapidly
B) it decreased rapidly
C) stabilize
D) none of the above

25- Which country will have a decrease in population?



A) Afghanistan
B) United States
C) Italy
D) all of the above

Answers table

Question	1	2	3	4	5	6	7	8	9	10	11	12	13
Answer													
Question	14	15	16	17	18	19	20	21	22	23	24	25	
Answer													

II- <u>Activity, Mid and Oral exams</u>: Put true (√) or false (X) for each of the following statements: **(30 marks)**

( ) 1- Natality is the change in the total population size per unit time.

( ) 2- Uniform distribution result from intraspecific competition amongst members.

( ) 3- J-shaped growth curve is independent of population density.

( ) 4- Populations cannot overshoot the carrying capacity.

( ) 5- Life tables provide a summary of mortality for a population.

( ) 6- Prey populations are dependent on predators but predator populations are not dependent on prey.

( ) 7- Population size is determined by the relationship between birth rate, death rate, immigration, and emigration.

( ) 8- Animal populations may fluctuate considerably over time.

( ) 9- Lifespan is an important aspects of life histories.

( ) 10- Population density declines with decreasing organism weight.

( ) 11- Organismal ecology examines factors that affect population size and composition.

( ) 12-Low reproductive rate considered as one of environmental resistance.

( ) 13-Carrying capacity is affected by net migration.

( ) 14-Early loss curves are typical of species that produce low number of offspring.

( ) 15-Population density declines with decreasing organism size.

أنتهت الأسئلة مع خالص التمنيات بالتوفيق،،،،،،،،،،،،

أ.د. خالد فؤاد عبد الوكيل

K. F. Wakeil

Assiut University Faculty of Science Zoology Department	- Academic Year: 2020/2021 - Course: Physiology 2 (Z310) (Final & Midterm) Time : 2 hours

Note: The exam is in three papers (two sides)

Part 1: Final exam (50 marks)

Q1: Choose the correct answer

1-Which of these cells are not a type of neuroglia found in the CNS:

a)astrocytes
b)microglia
c)Schwann cells
d)oligodendrocytes

2-Preparing the body for "fight-or-flight" response during threatening situations is the role of the:

a) sympathetic nervous system
b) parasympathetic nervous system
c) somatic nervous system
d) afferent nervous system

3-What are most neurons in the body?

a) Unipolar
b) Bipolar
c) Multipolar
d) Both a and b

4-Which cell is a macrophage found in the central nervous system?

a) Kupffer cells
b) Histiocyte
c) Langerhans cell
d) Microglia

5-Which of the following is involved in the blood brain barrier?

a) Astrocytes
b) Ependymal cells
c) Oligodendrocytes
d) a& b

6- Choose the true statement regarding second-order neurons

a) Second-order neuron cell bodies reside in the dorsal horn of the spinal cord.
b) Second-order neuron cell bodies reside in the thalamus
c) Second-order neurons conduct impulses to the spinal cord or brain stem.
d) Second-order neuron cell bodies reside in a ganglion

7- What is located in the lateral horn of the spinal cord grey matter?

a) interneurons that receive input from visceral sensory neurons
b) interneurons that receive input from somatic sensory neurons
c) somatic motor soma
d) visceral motor soma

8-What type of molecules are the main components of myelin?

a) carbohydrates
b) proteins
c) lipids
d) nucleic acid

9-If a thermorecptor is sensitive to temperature, what would a chemoreceptor be sensitive to?

a) light
b) sound
c) molecules
d) vibration

10-What does a ligand-gated channel require in order to open?

a) increase in concentration of Na^+ ion
b) binding of neurotransmitter
c) increase in concentration of K^+ ion
d) increase in concentration of Cl^- ion

11-What of the following neurotransmitter is associated with inhibition exclusively?

a) GABA
b) acetylcholine
c) glutamate
d)norepinephrine

12- Recently a 5th taste receptor called umami may play a role in food intake because it is sensitive to taste of.....

a) salts
b) alkaloids
c) meat
d) none of the above

13-Which of the following control body temperature and appetite.

a) hypothalamus
b) thalamus
c) pineal gland
d) pituitary gland

14-Which of the following hormones is both synthesized and stored in the pituitary gland?

a) Growth hormone.
b) Growth hormone releasing hormone.
c) Antiduretic hormone.
c) Somatostatin.

15- Which of the following anterior pituitary hormones plays a major role in the regulation of a non-endocrine target gland.

a) Adrenocorticotrophic hormone.
b) Thyroid-stimulating hormone.
c) Prolactin.
d) Follicle-stimulating hormone.

16- Which of the following hormones and the corresponding action is incorrect?

a) Glucagon – increased glycogenolysis in liver.
b) Glucagon – increased glycogenolysis in skeletal muscle.
c) Glucagon – increased gluconeogenesis.
d) Cortisol – increased gluconeogenesis.

17- What gland is located just superior to the kidneys?

a) Pituitary.
b) Adrenal.
c) Pancreas.
d) ovary

18-In the pancreas, which are the cells that secrete insulin, decrease the blood levels of glucose.

a) delta.
b) alpha.
c) beta.
d) both a & b

19- Which if the following gland which can be classified as an endocrine and an exocrine gland?

a) Thyroid.
b) Thymus.
c) Pancreas.
d) Pituitary.

20- The posterior pituitary stores and releases:

a) Growth hormone and prolactin.
b) Prolactin and oxytocin.
c) Oxytocin and antidiuretic hormone (ADH).
d)ADH and growth hormone

21- The pituitary hormone that stimulates the male testes to produce sperm and stimulates the development of the follicle in the female on a monthly cycle is:

a) growth hormone
b) luteinizing hormone
c) prolactin
d) follicle-stimulating hormon.

22- All of the following are hormones of the anterior pituitary except:

a) Human growth hormone (GH).
b) Follicle-stimulating hormone (FSH).
c) Parathyroid hormone (PTH).
d)Thyroid-stimulating hormone (TSH)

23- The primary target of the releasing and inhibiting hormones of the hypothalamus is the:

a) Liver and adipose tissue.
b) Gonads.
c) Anterior pituitary.
d) Bone marrow.

24- Which gland controls basal metabolic rate (BMR)?

a) Thyroid.
b) Parathyroid.
c) Testes.
d) Pancreas.

25- Which of the following decreases the rate of urinary excretion of calcium ions by the kidney?

a) Increase in calcitonin concentration in the plasma.
b) Decrease in phosphate ion concentration in the plasma.
c) Increase in the plasma level of parathyroid hormone.
d) Metabolic acidosis.

Q2: Write true (T) or false (F):

26- Activation of the parasympathetic nervous system leads to the 'fight and flight' response.
27- In phylum Mollusca the NS is consist of nervous ring around the mouth and get out from hem radial nerves.
28- In response to tissue damage, astrocytes transform into large amoeboid phagocytic cells.
29- Alzheimer's disease may be caused by a breakdown in the blood brain barrier.
30- Electrical nerve impulses not originate in axon hillock which is located near the cell body.
31- ACh receptors are ligand-gated cation channels composed of four different polypeptide subunits.
32- Agonist are drugs acting on receptors without initiating changes in cell function, not producing effects of various types.
33- Catecholamines catabolized to inactive compounds by catecholamine-O-methyltransferase (COMT) and monoamine oxidase (MAO).
34- The 5HT2A receptors mediate platelet aggregation and smooth muscle contraction.
35- Vagus nerves the only cranial nerves which extend beyond head and neck.
36- Lateral horns - located ONLY in sacral regions which contain visceral motor cell bodies.
37- Upper motor neuron (UMN) originates in nuclei deep in cerebrum.
38- The origin of sympathetic nervous system is thoracolumbar.
39- Follicle-stimulating hormone stimulates male testes to produce sperm.
40- Prolactin stimulates ovulation.
41- The zona glomerulosa produces catecholamine.
42- Epinephrine is secreted from adrenal medulla.
43- Adrenal cortex produces oxytocin.
44- Aldosterone is produced from adrenal medulla.
45- Parathyroid hormone regulates Mg^{+2} in blood.
46- Melanocyte stimulating hormone stimulates color change in reptiles.
47- Follicle stimulating hormone regulates the menstrual cycle.
48- Oxytocin is secreted from anterior lobe of pituitary gland.
49- Hormones are secreted directly into the blood.
50- Aldosterone plays a major role in the regulation of extracellular fluid volume.

Part 2: Mid-term (20 marks)
Choose the correct answer
51-The Nissl's granules of neuron made up of.....
a) DNA
b) RNA
c) Proteins
d) Ribosomes

52-Sympathetic nervous system induces.....

a) secretion of digestive juice
b) heart beat
c) secretion of saliva
d) all of the above

53-Postsynaptic receptors include all the following types, except .....

a) G-protein coupled receptors
b) ligand-gated cation channels
c) G-protein regulated K + channels
d) voltage-gated Cl- channel

54- Opening of ligand-gated Cl^- channels causes.....

a) inhibition of the postsynaptic neuron
b) depolarization of the postsynaptic neuron
c) initiation of an action potential
d) block of ligand-gated cation channels

55- Synaptic transmission s terminated by.....

a) block of pretsynaptic receptors
b) elevation of Ca^{++} concentration in synaptic cleft
c) reuptake of neurotransmitters by postsynaptic neurons
d) degradation of neurotransmitters by specific enzymes

56- All the following transmitters are neuropeptides, except.....

a) Neuropeptide Y
b) Somatostatin
c) Dopamine
d) Encephalin

57- Higher motor commands originate in all the following centers, except....

a) cerebral cortex
b) thalamus
c) caudate nucleus
d) cerebellum

58- All of the following are descending motor tracts, except....

a) Rubrospinal tract
b) Spinotectal tract
c) Reticulospinal tract
d) Corticobulbar tract

59-Bipolar neurons are found in....

a) retina of eye
b) cerebral cortex
c) embryo
d) respiratory epithelium

60 - There are.....pairs of cranial nerves and ..... pairs of spinal nerves.

a)12, 31
b) 31, 12
c) 12, 13
d) 12, 21

61- Homeostasis is controlled by .....

a) hormones
b) nervous system
c) a & b
d) none of them

62- ..... regulates the kidneys retention of water.

a) ADH
b) Oxytocin
c) Insulin
d) Thyroxin

63- ..... initiates uterine contraction during labor.

a) FSH
b) LH
c) Estrogen
d) Oxytocin

64- ..... stimulates the thyroid gland to produce thyroxin.

a) TSH
b) Parathormone
c) ADH
d) Insulin

65- ..... stimulates production of testosterone.

a) ADH
b) LH
c) Oxytocin
d) progesterone

66- ..... stimulates the adrenal gland to produce steroid hormones.

a) FSH
b) LH
c) ACTH
d) Insulin

67- ..... stimulates the growth of muscle and bones.

a) GH
b) FSH
c) ADH
d) LH

68- ..... stimulates milk production.

a) Oxytocin
b) Prolactin
c) MSH
d) FSH

69-..... increases metabolic rate.

a) Parathormone
b) Thyroxin
c) FSH
d) ADH

70- ..... stimulates calcium uptake by bones.

a) Thyroxin
b) Calcitonin
c) PTH
d) TSH

Good Luck

Prof. Hossam El-Din M. Omar

Dr. Sohair Ragab

Assiut University
Faculty of Science
Zoology Dep.

Final Exam, 2021
2nd semester, 20/6/ 2021
Histochemistry (316Z)
Time allowed: 2 hrs

First question (Final):

Which sentence is True, and which is False (one mark each):

1. Melting points and the presence or absence of hydrophobic groups are important features of lipids which affect their affinity to stains.
2. Cresyl violet used for detection of RNA.
3. The pyrimidine bases include thymine, uracil and cytosine.
4. Feulgen reaction used in demonstration of lipids.
5. In some enzymes used in histochemical methods, chondroitinase digest chondroitin sulfate.
6. Phospholipids are demonstrated by basic hematin method.
7. Carbohydrates are a group of compounds having the general formula $(CH_2O)_n$.
8. Sulphated acid mucopolysaccharides give negative results with metachromatic stain.
9. Beta rays represented as low kinetic energy.
10. Semithin section is more than (1μm) thickness.
11. In the indirect method of enzyme labelled antibody when Osmium tetroxide added to the complex it gives product suitable for electron microscopy.
12. Simple proteins are nucleoproteins, glycoproteins, chromoproteins and lipoproteins.
13. Proteins are usually named after their biochemical action with the addition of the suffix (ase).
14. The enzyme is highly labile, and it quickly disappears from the tissue as soon as the tissue is removed from the organism.
15. By the using of enzyme histochemistry, acid phosphatase can illustrate lysosomes.
16. Simple polysaccharides formed only of sugar molecules.
17. Unsaturated lipids are demonstrated by Ultraviolet Schiff method.
18. Immunohistochemical method for proteins depends on the use of markers to demonstrate antigens, antibodies and antigen-antibody complexes in tissues and cells.

19. Mucin can detect by PAS reaction.

20. Pyronine is black basic dye which stains RNA when carefully used.

21. Trypsin, chymotrypsin, and pepsin are used to hydrolyze polypeptides and proteins.

22. Polysaccharides are chains of < 9 monosaccharides.

23. At a basic pH, methyl green is specific for DNA.

24. Enzymes are proteins which catalyze the chemical reactions.

25. Frozen section can be done using liquid nitrogen or carbon dioxide.

26. Sagaguchi method is specific for demonstration of arginine.

27. The enzyme acts on the substrate and the product must be either colored (for examination with L.M.) or opaque (for examination with E.M.).

28. Plasmalogen of the brain can detected after treated with UV and Schiff's reagent.

29. Proteins can be demonstrated by immunohistochemical methods due to their antigenicity.

30. Amylases are used to digest protein.

31. Photographic emulsion diluted (1:1) by bi-distilled water.

32. Simple proteins are albumins, globulins, and fibrous proteins.

33. By using of enzyme histochemistry, dehydrogenase and ATPase can illustrate mitochondria.

34. Basophilia of pancreatic acini due to presence of attached ribosomes.

35. lipids are polymers of nucleotides.

36. Indirect fluorescent antibody method is known as the multiple layer or sandwich method.

37. Glycogen formed of about 30000 glucose molecules.

38. Methyl green is an impure basic dye for nucleic acids and chloroform extraction is necessary to purify it before use.

39. A colored soluble substrate (self-colored substrate) can be precipitated at the site of the enzyme activity if the enzyme renders it soluble by some molecular rearrangement.

40. The six-carbon hexose, glucose, is the most widely spread monosaccharide sugar.

41. Plasmalogens are demonstrated by the plasmal technique.

42. In post-incubation coupling, production of PRP happen in one step and the production of FRP take place separately in another step.

43. Fructose sugar is disaccharide consist of 2 glucoses.

44. Formal calcium is the worst fixative used in lipid demonstration methods.

45. Enzyme histochemical methods give indications of the metabolic activities taking place in the cell.

46. Feulgen reaction is cytochemical stain.

47. Osmium tetroxide is used in demonstration of unsaturated proteins.

48. In the direct method of enzyme labeled antibody when osmium tetroxide added to antigen-antibody peroxidase complex it gives opaque product for light microscopy.

49. Lactose sugar is disaccharide consist of glucose + galactose.

50. Enzymes are very sensitive compounds; they can be demonstrated histochemically only in fresh tissue.

Second question (Med term+Oral +Activity):

Which sentence is True, and which is False (one mark each):

51. Mucoproteins containing proteins and less than 4% aminosugars.

52. Triglycerides are demonstrated by Calcium lipase method.

53. In the indirect method of enzyme labeled antibody when DAP added to antigen-antibody peroxidase complex it gives Brown ppt.

54. Sudan black is less soluble in fat than fat solvents.

55. For histochemical purpose only, lipids classified according to their insolubility in water and solubility in fat solvents.

56. Examples of fibrous proteins are fibrin, elastin and reticulin.

57. Direct fluorescent antibody method depends on the possibility of antibody to conjugate with a fluorescent dye and at the same time leaving the capacity of it to combine with its antigen unchanged.

58. Hydrolysis of DNA using Hot 1N HCL liberated (HOH) groups and stain with Schiff's reagent.

59. Fluorescence microscopy used to identify crystalline cholesterol and cholesterol esters.

60. Fluorochrome disadvantages overcome by using of enzyme labeling of the antibodies.

61. Specific Antigen consists mainly of proteins, glycoprotein, and polysaccharides.

62. Fluorescence microscopes used to examine fluorescent lipids such as oxidation products of cholesterol.

63. The staining reactions for proteins or protein-containing substances depend on their amino acid composition.

64. Basophilia of nucleus depends upon the presence of (PO_4) groups.

65. The basic idea of oil soluble dyes is that the dye is more soluble in fat than in the solvent used.

66. Proteins are present in tissues in simple or conjugated forms.

67. Hematoxylin & Eosin are specific stain.

68. A nucleotide is formed of a pentose (or deoxy pentose), phosphoric acid and a base.

69. Bouin's fixative should not be used in demonstration of DNA because it causes over hydrolysis.

70. Acidophilic cytoplasm means staining with acid dye such as Eosin.

71. The purine bases include adenine and guanine which are single heterocyclic rings.

72. The mild hydrolysis of DNA with M-HCL yield aldehyde groups by breaking the purine deoxyribose bond.

73. Paraffin technique takes short time and cheap.

74. Purines and pyrimidines (bases) can be demonstrated by the ultraviolet microscope.

75. Sugars especially deoxyribose are detected by use of the Schiff s reagent after hydrolysis with M-HCL.

76. NaOH removes phosphoglycerides from tissues bearing sphingomyelins in acid hematin method.

77. Waxes are esters of fatty acids with short chained alcohols.

78. Total protein can be detected by Mercury bromophenol blue.

79. Immunoenzyme techniques are use of enzyme labeling of the antibodies especially with the horseradish peroxidase.

80. Free fatty acids are demonstrated by the copper Rubeanic acid method.

END OF QUESTIONS

WITH OUR BEST WISHES

Prof. Dr. Hanem Saad Abdel-Tawaab

Dr. Alshaimaa Ahmed Alghriany

Assiut University
Faculty of Science
Dept. of Zoology

Final Exam of Cell Biology (312Z) for Zoology Students

July, 2, 2021 **Time 2 hours**

Part I 50 Marks

1- Choose the correct answer: (40 Marks)

1- In some tissues, such as ....., cell division ceases sometime after birth.

a) muscle cells b) nerve cells c) both a and b

2- Subsequent tissue growth of nerve tissue results from individual .....

a) cell growth without division b) cell division c) both a and b

3- The generation time is the time required for the number of ells in the population to exactly.....

a) double b) half c) two-third

4- The phenomenon in which the increase in cell numbers often halts and contact with one another is called:

a) growth inhibition b) contact inhibition c) division inhibition

5- Microscopic counting of cells using special glass slides *(Hemocytometer)* known as:

a) optical enumeration b) electronic enumeration c) statistical enumeration

6- Temperature cycles, light cycles and chemical manipulations are used in:

a) synchrony by induction b) synchrony by selection c) a and b

7- The sequence of activities exhibited by cells is called: .....

a) cell population b) cell growth c) the cell cycle

8- When a cell leaves the cycle and quit dividing, this period is called: .....

a) G2 b) G1 c) G0

9- To produce two similar daughter cells, the complete DNA instructions in the cell must be:

a) replicated b) duplicated c) mutated

10- Which one of the following statements regarding death by injury is **false**?

a) they (and their organelles like mitochondria) swell
b) the cell contents leak out, leading to
c) no inflammation of surrounding tissues

11- The phagocytic cells secrete .....that inhibit inflammation.

a) thyroxin b) cytokines c) adrenaline

12- The resorption of the tadpole tail at the time of its metamorphosis into a frog takes place by .....

a) apoptosis b) hydrolysis c) dissolving in water

13- Bcl-2 is bound to a molecule of the protein known as .....

a) Apaf-1 b) TNF-α c) CD95

14- Caspase ..... cleaves and, in so doing, activates other caspases like caspase-3 and -7.

a) 4 b) 8 c) 9

15- Apoptosis-inducing factor (AIF) is a protein that is normally located in .....

a) intermembrane space of mitochondria b) lysosomes c) peroxisomes

16- The Epstein - Barr virus (EBV), which associated with some lymphomas, produces a protein similar to.....

a) Apaf-1 b) Bcl-2 c) caspase-9

17- The hallmark of AIDS is the decline in the number of the patient's .....

a) CD4+ Bcells b) CD4+ T cells c) a and b

18- To get continuous culture of cell, one popular method involves the use of .....

a) chemostat b) hemostat c) gate stat

19- Which one of the following statements regarding culture fractionation is **FALSE**?

a) selecting cells at the same age b) selecting cells at the same stage of growth division cycle

c) avoids the potential problems of synchronization techniques

20- The progressive deterioration of many bodily functions over time is called.....

a) cancer b) immune deficiency c) senescence

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

2- Choose the correct answer: (10 Marks)

1- One of the genes that control a special stage in the worm's development called dauer formation is ..... a) Apaf- b) c-fos c) 1*daf-2*

2- After a certain number of divisions, cells enter a state in which they no longer proliferate and DNA synthesis is blocked this is known as .....

a) Cellular Senescence b) cellular apoptosis c) cellular necrosis

3- The senescent cells continue to respond to hormones and other outside stimuli, but can't .....

a) proliferate b) growth c) a and b

4- Proliferative genes, such as c-fos and others of its kind are countered by....., which seem to interfere with division.

a) apoptotic genes b) anti-proliferative genes c) necrotic genes

5- In cell population growth cycle, the phase in which the number of cells in the population no longer increase and may even decrease known as: .....

a) exponential phase b) death phase c) stationary phase

6- If a large number of cells are cultured together in what is called "batch culture" the individual cells will be found in a variety of stages of:

a) cell cycle b) cell growth c) cell division

7- When the number of cells in the population no longer increase and may even decrease it is called:

a) lag phase b) death phase c) stationary phase

8- Filtration and sedimentation are used in:

a) synchrony by induction b) synchrony by selection c) a and b

9- The period of diverse activities of the cells is called:

a) metaphase b) mitosis c) interphase

10- In stage ..... of the cell cycle, the cell will continue to grow and produce new proteins only.

a) G2 b) G1 c) interphase

1	2	3	4	5	6	7	8	9	10

Part II 30 Marks

1- Oral Exam (10 Marks)

Choose the correct answer:

1- Mitochondrial DNA is injured at a much greater rate than nuclear DNA, possibly because.....

a) It is unprotected by the protein coat b) It is a circular molecule c) a and b

2- Cells that are induced to commit suicide .....

a) shrink b) swell c) divide

3- As in both G1 and G2, there is a Checkpoint in the middle of mitosis which known as:

a) anaphase checkpoint b) metaphase checkpoint c) telophase checkpoint

4- The formation of the fingers and toes of the fetus requires the removal of the tissue between them by .....

a) degeneration b) necrosis c) apoptosis

5- Increased levels of oxidants within the cell consider one of the following statements:

a) receipt of negative signals b) withdrawal of positive signals c) a and b

6- The protein .....migrates to the outer mitochondrial membrane and punching holes in it.

a) Bcl2 b) Bax c) Apaf-1

7- When glucose binds with collagen as it tends to do as we age, this normally supple protein loses much of ..... a) its length b) its flexibility c) its weight

8- Melanoma (the most dangerous type of skin cancer) cells avoid apoptosis by inhibiting the expression of the gene encoding .....

a) Apaf-1 b) p53 c) Bcl-2

9- In AIDS patients the number of CD4+ T cells declines below about .....

a) 200 per µl b) 300 per µl c) 400 per µl

10- The anterior chamber of the eye is immunologically privileged site because their cells express high levels of:

a) Fas b) Fas L c) TNF-α

1	2	3	4	5	6	7	8	9	10

2- Write the following data (10 Marks)

A- Cells that are damaged by injury undergo a characteristic series of changes such as:

1-

2-

3-

B- The phases of a cell population growth cycle are:

1-

2-

3-

4-

C- Internal biological clocks or "programs" theories of aging include:

1-

2-

3-

3-Write on two only of the following:- (10 Marks)

1- DNA repair and synthesis.
2- Heat shock protein.
3- Proliferative genes.
4- Hormone replacement.
5- Apoptosis and tissue transplantation.

Best Wishes

Prof. Gamal El-Sokkary

Assiut University
Faculty of Science
Zoology Department

Course name: Cell and Molecular Biology
Course code: (318Z)
Time: Two hours
June 2021

I-Choose the correct answer (50 marks, one mark for each):

1- In eukaryotic cell, microtubules are NOT found in?
(A) Cilia (B) Mitotic spindle
(C) Flagella (D) Nucleus

2- The prokaryotic cells are characterized by::
(A) A distinct nuclear membrane (B) Absence of chromatin material
(C) Distinct chromosome (D) Absence of nuclear membrane

3- Chemical energy of food stuffs is converted into biologically useful forms by:
(A) Ribosomes (B) Golgi complex
(C) Mitochondria (D) Plastids

4- Membrane occurs in:
(A) Chromosomes, nuclei and mitochondria (B) Lysosomes, ER and mitochondria
(C) Cytoplasm, nuclei and starch grains (D) Chromosomes, ribosomes and starch grains

5- Plasma membrane is:
(A) Non-selective barrier (B) Selective barrier
(C) Impermeable (D) Made of cellulose

6- The membrane protein that extend through both sides of lipid bilayer:
(A) Acidic protein (B) Glycoprotein
(C) Integral protein (D) Glycolic acid

7- Mitochondrion is bounded by:
(A) A single unit membrane (B) Two unit membranes
(C) No membranes (D) Plasma membranes

8- A ribosome consists of:
(A) Four subunits (B) Three subunits
(C) Six subunits (D) Two subunits

9- The 80S ribosomes of eukaryotes break into:
(A) 50S and 30S (B) 40S and 40S
(C) 60S and 40S (D) 60S and 50S

10- Proteins are modified in:
(A) ER (B) Golgi complex
(C) Both A and B (D) Neither in A nor in B

11- The pattern of microtubule organization in centriole is:
(A) 9 + 0 (B) 9 + 1

(C) 9 + 2 (D) 9 + 3

12- Which of the following is NOT part of the plasma membrane?

(A) Lipids (B) Carbohydrates

(C) Proteins (D) Nucleic Acids

13- When looking at the plasma membrane, where are the lipid heads located?

(A) Floating between bilayer levels (B) Outer part of the bilayer

(C) Inner part of the bilayer (D) Located at different parts throughout the bilayer

14- Alpha helix and Beta sheets are:

(A) Polypeptide chains (B) Folded proteins

(C) Amino acids (D) Protein secondary structures

15- What forms the channels and pumps in the phospholipid bilayer?

(A) carbohydrates (B) Proteins

(C) hydrophilic heads (D) Lipids

16- Specific proteins help move particles, but NO energy is needed. This is:

(A) Facilitated diffusion (B) Exocytosis

(C) Active transport (D) Equilibrium

17- The main function of lysosomes is :

(A) Excretion (B) Digestion

(C) Synthesis (D) Mobility

18- Neutralization of toxins in the liver is carried out by:

(A) Smooth endoplasmic reticulum (B) Sarcoplasmic reticulum

(C) Rough endoplasmic reticulum (D) Nucleus

19- Which type of macromolecules make up the wall of microtubules?

(A) Tubulin dimers (B) Phspholipids

(C) Deoxyribonucleic acids (D) Carbohydrates

20- The drug colchicine facilitates microtubule:

(A) Assembly (B) Depolymerization

(C) Acidification (D) Condensation

21- Vimentin is:

(A) intermediate filament (B) microfilament

(C) inherited disorder (D) neurodegenerative disease

22- The growing microtubule is stabilized by:

(A) ATP (B) ADP

(C) GTP (D) NADH

23- DNA replication occurs during .....of the cell cycle.

(A) S phase (B) M phase

(C) G2 phase (D) G0 phase

24- Chromosomes reach equator during cell division at:

(A) Prophase (B) Telophase

(C) Metaphase (D) Anaphase

25- In Figure-1; letter "A" is which structure in the microtubule doublet of cilia?

(A) Tubulin (B) Lamins

(C) Dynein (D) Vimentin

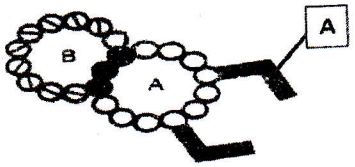


Figure-1

26- The complementary nitrogenous bases in DNA double strands are held by.....bond

a- Phosphodiester b- hydrogen c- ester d- nitrogen

27- The process of DNA replication involves many enzymes except.....

a- DNA polymerase b- DNA helicase c- DNA terminase d- RNA primase

28- The 1' carbon atom of deoxyribose sugar in DNA is linked with.....

a- Free OH group b- phosphate group c- nitrogenous base d- H atom

29- The newly synthetized DNA strand always extended in .....direction

a- 5'-to-3' b- 3'-to-5' c- any d- both 5'-to-3' and 3'-to-5'

30- The acceptor stem in tRNA for amino acid attachment is found in .....

a- 5' end b- 3' end c- both ends d- the middle of the sequence

31- .....unwind the DNA double helix during transcription

a- DNA helicase b- DNA polymerase c- RNA polymerase d- transcription factors

32- ATP, the major energy source of biological activity is.....

a- an RNA nucleotide b- a DNA nucleotide c- an RNA nucleoside d- a DNA nucleoside

33- **The most acceptable model of** DNA replication is the..... model

a- Conservative b- semi-conservative c- dispersive d- none of the mentioned

34- In regulation of transcription by.....where the end products speed up or slow the synthesis of mRNA

a- Splicing b- enzyme induction c- feedback control d- all answers are correct

35- In prokaryotes, transcription of proteins is regulated by .....which is a DNA sequence preceding the gene sequence.

a- Splicing b- transcription c- an operon d- none of the mentioned

36- Which of the following represents start codon for protein synthesis by ribosome?

a- GAU b- AGU c- UGA d- AUG

37- The coding parts of DNA of eukaryotes is called.....

a- histones b-exons c- introns d- all answers are correct

38- In transcription,..... moves along the DNA template in the 3'-5' direction to synthesize the corresponding mRNA.

a- DNA Helicase b- DNA polymerase c- RNA polymerase d- Topoisomerase

39- The length of DNA that wrapped around histones to form nucleosome is..... Base pairs.
a- 166 b- 48 c- 66 d- 148

40- Which enzyme of the following catalyzes the formation of mRNA?
a- RNA Helicase b- DNA polymerase c- RNA polymerase d- RNA ligase

41- The name of the RNA nucleoside containing Cytosine base is .....
a- Cytosine b- Cytidine c- Cytidine -5' monophosphate d- deoxycytidine

42- The Okazaki fragments are joined together by .....
a- DNA primase b- DNA polymerase c- DNA helicase d- none of the mentioned

43- Which enzyme of the following catalyzes the formation of 5'-3'ester bonds during DNA synthesis
a- DNA Helicase b- DNA primase c- DNA ligase d- none of the mentioned

44- Between A and T bases of DNA there are..... Hydrogen bonds
a- two b- three c- four d- five

45- DNA is wrapped around proteins called..... to form nucleosomes.
a- actins b- vinmentins c- histones d- ribophorins

46- The most abundant RNA in the cell is.....
a- mRNA b- tRNA c- rRNA d- siRNA

47- The basic DNA monomers are.....
a- Nitrogenous bases b- phosphate groups c- Nucleotides d- sugar group

48- The nitrogenous bas Adenine belongs to.....
a- Purines b- pyrimidines c- double rings nitrogenous bases d- a and c

49- In DNA, a nucleoside consists of a nitrogen base linked to .....sugar
a- C 1' ribose b- C 3' deoxyribose c- C 1'deoxyribose d- C 5' deoxyribose

50- The 3' carbon at the end of one DNA strand is linked with.....
a- OH group b- phosphate group c- nitrogenouse base d- deoxyribose sugar

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II-Midterm, oral and activity questions: Choose the correct answer (30 marks, 2 marks for each):

51- Which is true about active transport?

(A) It does not require energy
(B) It requires energy
(C) It moves substances down the concentration gradient
(D) it moves material from high to low concentration

52- A group of fibers running throughout the inside of a cell that supports the cell and helps the cell move:

(A) Cytoskeleton
(B) Scaffolding
(C) Gremlins
(D) Exoskeleton

53- Nuclear membrane breaks down at which stage:

(A) Metaphase
(B) Prophase
(C) Anaphase
(D) Telophase

54- The rate of "dynamic instability" of the microtubule growth is regulated by:

(A) Tubulin subunits
(B) P53
(C) ATP production
(D) GTP hydrolysis

55- A cellular structure which consists of four histones complexed with DNA is called:

(A) Nucleosome
(B) Endosome
(C) Centrosome
(D) Chromosome

56- Nuclear membrane is involved in:

(A) Synapses of homologous chromosomes
(B) Nucleocytoplasmic exchange of materials
(C) Anaphasic separation of daughter chromosomes
(D) Organization of spindles

57- Which term is used to refer to a period between the cell divisions?

(A) M phase
(B) Interphase
(C) S phase
(D) None of these

58- In Figure-2; letter "X "refers to which movement pattern of Phospholipids?

(A) Lateral diffusion
(B) Flexion
(C) Rotation
(D) Flip-flop

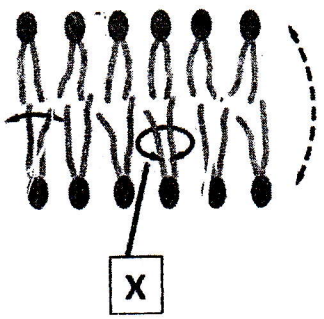

Figure-2

59- Figure (1) represents DNA replication, where X refers to.....

a- Lagging strand b- leading strand c- Okazaki fragment d- replication fork

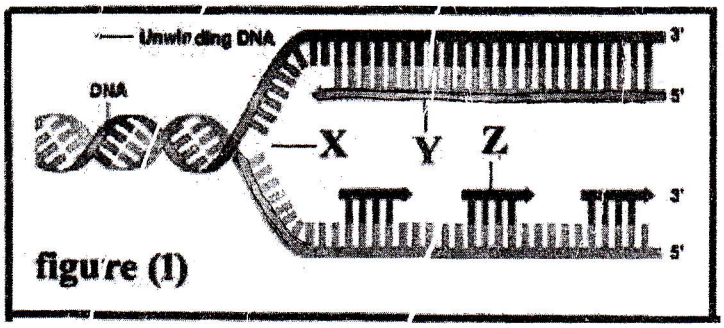

figure (1)

60- Figure (1) represents DNA replication, where Y refers to.....

a- Lagging strand b- leading strand c- Okazaki fragment d- replication fork

61 Figure (1) represents DNA replication, where Z refers to.....

a- Lagging strand b- leading strand c- Okazaki fragment d- replication fork

62- Figure (2) represents transcription process, where X refers to.....

a-Template strand
b- none-template strand
c-RNA polymerase
d- RNA synthesis

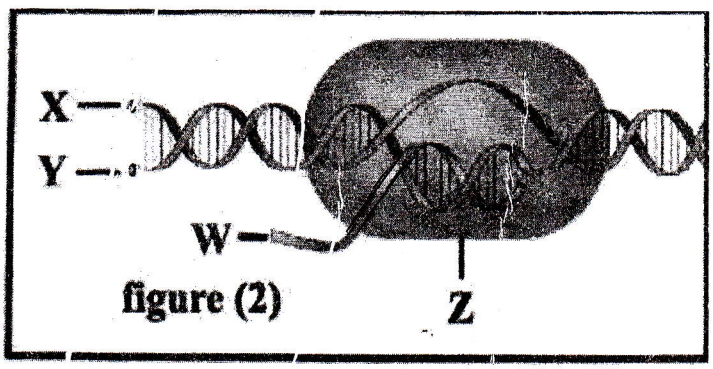

figure (2)

63- Figure (2) represents transcription process, where Y refers to.....

a-Template strand b- none-template strand c- RNA polymerase d- RNA synthesis

64- Figure (2) represents transcription process, where Z refers to.....

a-Template strand b- none-template strand c- RNA polymerase d- RNA synthesis

65- Figure (2) represents transcription process, where W refers to.....

a-Template strand b- none-template strand c- RNA polymerase d- RNA synthesis

End of questions

Good luck