



Final Exam 2018/2019

Answer the following questions:-

1- a-Complete:-

(5 Marks)

- Brackishwater pond is essentially located on
- Mariculture may be in.....
- In recirculatory culture water is
- Polyculture is the culture of.....in the same waterbody.
- Culture of.....and.....is a good example of polyculture.
- The fish farm should be sited in areas unsuited to.....
- Seed is a major determinant for.....
- Feed analysis is used for determining
- (1),,,and.....
- (2).....and.....
- Methods of feeding are.....and.....
-and.....and other water birds are fish predators..

b-Mention the desirable characteristics of aquaculture organisms. (5Marks)

2- What are:

(10Marks)

- (a) The causes of mortality in live fish transportation.
- (b) The criteria for choice of feeds.
- (c) The different kinds of aquaculture.

3- Mention only 5 of:

(10 Marks)

- (a) Objectives of aquaculture.
- (b) Economic and social factors affecting selection of sites for aquaculture.
- (c) Merits of cage culture.

4- Write on:

(10Marks)

- (a) Different kinds of artificial feed.
- (b) Effects of diseases on fishes.
- (c) Criteria for selection of chemicals for disease control in fishes.

5- Explain:

(10Marks)

- (a) Limitations of cage culture.
- (b) Criteria for selection of species for culture.
- (c) The required geotechnical data for fish farm.

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Good Luck

Prof.Dr. Usama M.Mahmoud



الأمتحان في ٦ صفحات

Answer the following questions:

(50 marks)

I- Write the scientific term of the following statements:

(10 marks)

1. A group of organisms born at the same time. (.....)
2. The movement of organisms into a population. (.....)
3. An interaction between two species where one organism benefits and the other experiences a decrease in growth, reproduction, or survivorship. (.....)
4. The study of changes in the size and composition of populations, and the factors influencing these changes. (.....)
5. One plant releases toxic compounds (e.g. phenols or alkaloids) which inhibit the growth of nearby plants. (.....)
6. Individuals of different species compete for the same resource. (.....)
7. Examines the energy flow and cycling of chemicals among the various abiotic and biotic components. (.....)
8. The total number of organisms in the population. (.....)
9. All environmental factors which limit the growth of populations (.....)
10. A group of spatially separated subpopulations connected by active exchanges of individuals among subpopulations. (.....)

Choose the correct answer and also write its letter in the answers table below:

(20 marks)

1- Species exist under strong competition and are pushed to use available resources more efficiently.

- A) Short-lived species
C) K-Selected species

- B) Large species
D) r-Selected species

- 2- Which distribution pattern does territoriality produce?
- A) Random
B) Uniform
C) Clumped
D) None of the above
- 3- are important aspects of life histories
- A) Environmental resistance and Biotic potential
B) Lifespan and Biotic potential
C) Mortality and Immigration
D) Both A and B
- 4- is a release of chemicals by plant species to inhibit the growth of its own seedlings.
- A) Autotoxicity
B) Allelopathy
C) Antibiosis
D) Both A and B
- 5- One of the following is not related to the others.
- A) Sex ratios
B) Fecundity
C) Age structure
D) Population distribution
- 6- Which one of the following is NOT 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 harmed while the other is unaffected.
- A) Commensalism
B) Mutualism
C) Amensalism
D) Parasitism
- 9- The mortality rate of organisms following a type III survivorship curve is
- A) constant throughout life
B) higher in post-reproductive years
C) lower after the organisms become established
D) unrelated to age
- 10- What type of survivorship curve do humans have?
- A) Type I
B) Type II
C) Type III
D) Type IV
- 11- competition occurs when a resource is inadequate for the needs of all individuals.
- A) Intraspecific
B) Exploitative
C) Apparent
D) Scramble

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

- A) survivorship
- B) density
- C) mortality
- D) age distribution

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 Not 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- Choose the factor that limits population growth.

- A) predation
- B) harsh weather
- C) disease
- D) All are factors that could limit population growth

18- One of the following is Not an unique adaptation of predator-prey interactions.

- A) Camouflage
- B) Mimicry
- C) Running
- D) Warning colors

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 age distribution of a population reflects its

- A) history of survival
- B) reproduction
- C) potential for future growth
- D) all of the above

Answers table

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

III- Answer ONLY FIVE questions of the following: (20 marks)

1. Environment limits the geographic distribution of species. Use the following Figure to illustrate that?

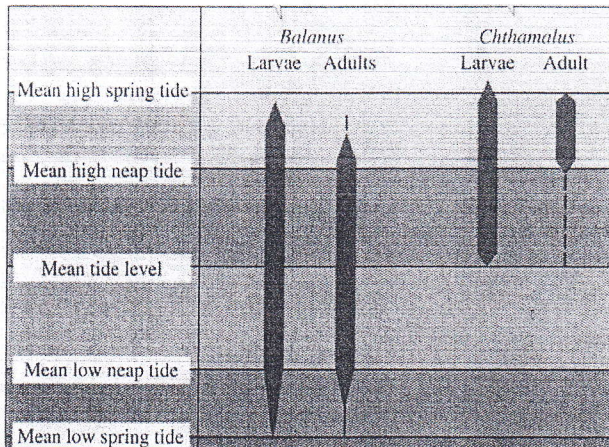


FIGURE: Distributions of two barnacle species within the intertidal zone.

2. Complete the following table to show the differences between 'r' and 'K' selection species

	<i>r</i> -selected species	K-selected species
Mortality		
Survivorship		
Population size		
Length of life		

3. In a mark – recapture study of Woodlice (Isopoda) population, A total of 500 were marked. 24 hours later, woodlice were collected again in the same place. This time 300 were found, of which 100 were seen to be already marked from the first time. What approximately, is the estimated population size of woodlice in this area?

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4. "There are many sampling methods to estimate population size and density". Mention the main sampling techniques of animal populations.

.....

.....

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.....

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5. "Different organisms may live together in a close association and they effect on each other". Mention the types of interspecific interactions and illustrate the benefit and harmful effects for the associated species.

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H. F. Wakarusa



الامتحان في اربع صفحات- اجعل اجابتك في الجدول المخصص كما هو موضح في نهاية كل سؤال

I- Choose the right answer. (20 marks, one mark for each)

- 1- The Okazaki fragments formed in.....
a- Lagging strand b- leading strand c- both strands d- none of the mentioned
- 2- DNA of eukaryotes contains that code for proteins
a- histones b-exons c- introns d- none of the mentioned
- 3- 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
- 4- Cellular organelle which is responsible for formation of the sperm acrosome
a- Mitochondria b- ribosomes c- Golgi apparatus d- centriole
- 5- Primary lysosomes are characterized by
a- obvious membranes b-large size c- residual bodies d- none of the mentioned
- 6- Smooth endoplasmic reticulum..... Ribophorin I and II.
a- contains b- lacks c- segregates d- all the mentioned
- 7- is the pre-DNA synthesis phase of cell cycle.
a- G₁ b- G₀ c- G₂ d- S
- 8-DNA base pairs are wrapped around histones to form nucleosome.
a- 166 b- 48 c- 66 d- 148
- 9- Which enzyme of the following catalyzes the formation of mRNA?
a- RNA Helicase b- DNA polymerase c- RNA polymerase d- RNA ligase
- 10-cannot diffuses through synthetic lipid bilayer.
a- H₂O b- O₂ c- Glucose d- Ethanol
- 11- is the intermediate filaments found in mesenchymal cells
a- Vinmentin b- Desmin c- Cytokeratin d- Actin
- 12- Consists only 5-10% of total cellular RNA.
a- mRNA b- tRNA c- rRNA d- siRNA

- 13-becomes inactive and accordingly autophagy is starting.
a- mTOR b- autolysosome c-bcl-2 d- TNF- α
- 14- is the organelle where degradation of proteins marked with ubiquitin occurs
a-Lysosome b- Peroxisome c- Proteasome d- Ribosome
- 15- Which of the following is the mark of extrinsic apoptosis
a- Caspase 8 b- Caspase9 c- bax d- bcl-2
- 16- The inactive genes are found in the form of
a- Chromatid b- heterochromatin c- euchromatin d- none of the mentioned
- 17- Pars granulosa of nucleolus contains.....
a- DNAb- mRNAc-ribosomes d- rRNA
- 18- consist of 9 doublets of microtubules surrounding 2 central tubules.
a- centriols b- cilia c- flagella d- b and c
- 19- Lipofusion pigment may found in cells
a- skin b- heart c- stomach d- all the mentioned
- 20- The name of the RNA nucleoside containing Cytosine base is
a- Cytosine b- Cytidine c- Cytidine-5' monophosphate d- deoxycytidine

انقل الجدول في كراسة الاجابة واكتب فيه الحرف الدال على الاجابة الصحيحة

Question no.	1	2	3	4	5	6	7	8	9	10
Answer										
Question no.	11	12	13	14	15	16	17	18	19	20
Answer										

II- Put (v) beside the right sentences and (x) beside the wrong sentences. (10 marks, one mark for each)

- The acceptor stem in tRNA for amino acid attachment is found in 3' end.
- Ribosomal RNA is the most abundant type of total RNAs in the cells.
- The newly synthesized DNA strand always extended in 5'-to-3' direction.
- Name of adenine nucleotide in RNA is deoxyadenosine5'-monophosphate.
- In a prokaryotic cell, the DNA is concentrated in a structure called nucleoid.
- Sarcoplasmic reticulum is a specialized form of SER found in muscle cells.

- 7- Catalase is one of lysosomal enzymes.
 8- In prokaryotes there are no membrane-bounded organelles. .
 9- In eukaryotic cells, the regulation of transcription is controlled by an operon.
 10- bax is involved in extrinsic pathway of apoptosis.

انقل الجدول في كراسة الاجابة واكتب فيه اجابتك

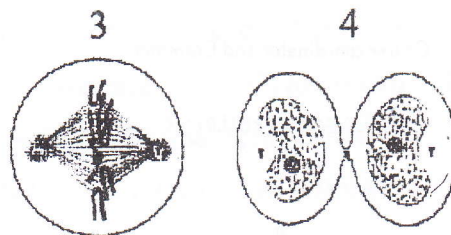
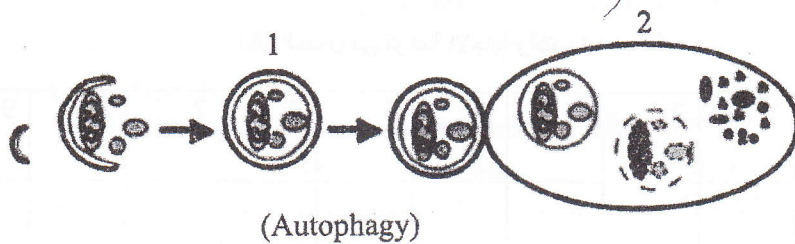
Question no.	1	2	3	4	5	6	7	8	9	10
Answer										

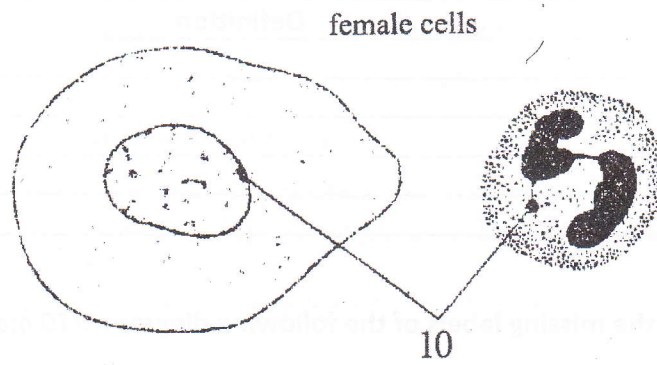
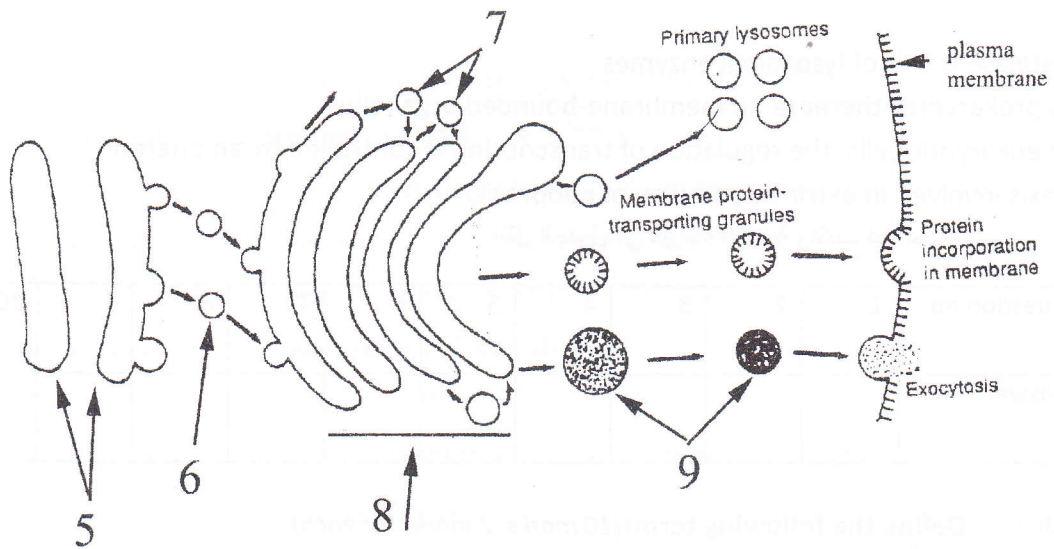
III- Define the following terms (10 marks, 2 marks for each)

انقل الجدول في كراسة الاجابة واكتب فيه اجابتك

Term	Definition
1- Cytokeratins	
2- anticodon	
3- Introns	
4- Transcription	
5- AUG	

IV- Complete the missing labels of the following diagrams. (10 marks, one mark for each)





انقل الجدول في كراسة الاجابة واكتب فيه اجابتك

Question no.	1	2	3	4	5	6	7	8	9	10
Answer										

End of questions, Best wishes

Course coordinator and Examiner

Prof.Abo bakrEltayeb



June, 2019

(1) Choose the correct answer:-

(10 Marks)

1- Gastrulation in toad involves:

- a- Epiboly b- Invagination c- Involution d- All

2- Sperms are produced in the:

- a- Seminiferous tubules b- Interstitial cells
c- Vas deferens d- Prostate gland

3- The eggs of mammals are:

- a- Alecithal b- Mesolecithal c- Microlecithal

4- Acrosome is the structure found with:

- a- Mammalian embryo b- Sperm c- Fertilized egg d- Ovum

5- "4" pairs of somites are formed after:

- a- 12 hours of incubation b- 18 hours of incubation
c- 24 hours of incubation d- 15 hours of incubation

6- Stage of embryonic development in which differentiation of cells occur:

- a- Blastula b- Morula c- Gastrula d- Neurula

7- Development of an egg without fertilization is called:

- a- Gametogenesis b- Parthenogenesis c- Oogenesis

8- External fertilization is seen in:

- a- Fish b- Bird c- Rabbit

9- The muscles originate during the development from:

- a- Yolk plug b- Ectoderm c- Endoderm d- Mesoderm

10- Brain of vertebrates develops from:

- a- Endoderm b- Mesoderm c- Ectoderm

(2) Differentiate between:-

(10 Marks)

- A- Macrolecithal and centrolecithal eggs.
- B- Yolk sac placenta and allantoic placenta.

(3) With the help of series of labelled diagrams only, show the various

types of blastula found in chordates.

(10 Marks)

(4) Mention whether each of the following statements is True (T) or False

(F) and correct the false one:-

(10 Marks)

- 1- The midpiece of the sperm contains axoneme surrounded by 7 dense fibers.
- 2- Meroblastic cleavage occurs in frog.
- 3- The right and left axis is the line between the two lateral sides of the body.
- 4- Yolk plug forms during blastulation.
- 5- Polar bodies are formed during the formation of sperm.
- 6- The gray crescent of frog is formed after fertilization.
- 7- Polyspermy leads to abnormalities in most mammals.
- 8- Vitelline membrane is secondary egg envelop.
- 9- Spermiogenesis is the process of transformation of nonmotile spermatid into motile sperm.
- 10- The type of placenta found in human is cotyledonary placenta.

(5) Answer only two of the following questions:-

(10 Marks)

- A- Explain the formation of amnion and chorion in chick embryo.
- B- Discuss the process of gastrulation in Amphioxus.
- C- Describe the primitive streak of chick embryo.

Best wishes

Prof.Dr. Abdallah B. Mahmoud

Dr. Dalia Elzahraa Farouk



June 2019

Answer the following question (illustrating your answer with labeled drawings whenever possible)

A- Choose the one correct answer: (10 marks)

- 1- *Lymnaea truncatula* is intermediate host of (*Schistosoma haematobium*- *S. mansoni*- *Fasciola gigantica* –none of them)
- 2- The second intermediate host of *Dipyllobothrium latum* (Cyclops- cattle- sheeps - frogs –none of them)
- 3- Auto-infection could be propagated by (*Ascaris* sp. – *Encylostoma* sp.-*Taenia saginata*–*Heterophyes heterophyes* - none of them).
- 4- The intermediate host of *Wuchereria bancrofti* is (*Anopheles*- *Culex*- *Ades*- all of them).
- 5- Human acts as intermediate host of (*Taenia solium* – *Fasciolepis buski*- *Balantidium coli* –*Hymenolepis nana* - none of them)
- 6- Malaria vector in Egypt is (male of culex - house fly - sand fly – tse tse fly - none of them).
- 7- Infective stage of *Heterophyes heterophyes* is encysted in (grasses- snails- sheep- fish)
- 8- Thin blood smear prefer for diagnosis of (Malaria- Microfilaria- Schistosomiasis- Trichomoniasis).
- 9- Examination of helminthes eggs in feces occurs by (direct smear- sedimentation- floatation- all of them).
- 10- The ootype in trematoda connect with (oviduct- vitelline canal- uterus- all of them).

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B- Fill in the blank

(13 marks)

1. *Giardia lamblia* lives init multiplies by.....
2. Infection with *Dipyllobothrium latum* is due tobut infection with *Dipylidium caninum* is due to
3. Adult worms of *Wuchereria bancrofti* occur in.....,they transmitted by.....and their adult female laying larvae termed.....
4. The association between two organisms may be symbiosis, which means.....and Parasitism, which means.....
5. *Entamoeba coli* lives inbut *Entamoeba gingivalis* lives inthey feeding mainly on.....
6. Zoonoses is

C- Compare (with drawing) between three only of the following: (12 marks)

- 1- Intestinal and tissue nematodes
- 2- Different stages of *Trypanosoma*
- 3- Cyclophyllidae and Pseudophyllidae
- 4- *Giardia lamblia* and *Trichomonas hominis*

D- Write briefly (with drawing) on three only of the following: (15 marks)

- 1- Detailed life cycle of one parasite transmitted to human through consumption of cattle meat?
- 2- Effects of Parasites in hosts.
- 3- Reproductive system in Platyhelminthes
- 4- Differences between *Schistosoma mansoni* and *Schistosoma haematobium* in the following items (habitat, intermediate host, infective stage and eggs).

Good luck

Prof. dr., Gamal H. Abed

Dr. Sara S. Abdel-Hakeem

**I- Choose the correct answer. (10 marks, one mark for each)**

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- 1-is a large (~500-kDa) RNA-multiprotein complex, which triggers mRNA degradation in response to siRNA
a- Dicer b- RISC c- Pasha d- Drosha
- 2- The negative selection marker (HSVtk) in homologous recombination during gene knockout is cloned of the homologous sequence in the targeting vector.
a- Outside b- inside c- in the middle d- not mentioned
- 3- CRISPR-Cas3 is belonging to.....CRISPR-Cas system.
a- Class 1 type II b- Class1 type I c- Class 2 type III d- Class 2 type II
- 4- Adenosine deaminases catalyze A to I only on.....
a- dsRNA b- ssRNA c- dsDNA d- ssDNA
- 5- Type I restriction enzymes require.....
a- Mg²⁺ b- ATP c- adenosyl methionine d- all the mentioned
- 6- Ligase enzyme connects DNA molecule by
a- Forming polynucleotide b- Forming hydrogen bonds
c- Linking nitrogen bases d- Attaching purines to pyrimidines
- 7- To clone single stranded DNA, it is likely to usevector
a- Lambda phage b- M13 c- Plasmid d- BAC
- 8- Which enzyme of the following is responsible for making a DNA copy from RNA?.....
a- DNA ligase b- DNA helicase c- Reverse transcriptase
d- RNA pol
- 9- A genomic DNA library is a.....
a- Set of clones representing the entire genome of an organism
b- Set of cDNA clones c- cDNA fragment inserted into a vector d- All are true
- 10- Control of several genes by a single promotor refers to
a- MCS b- Transcription control c- Operon d- Translation control

1	2	3	4	5
6	7	8	9	10

II- Put (✓) beside the right sentences and (x) beside the wrong sentences. (10 marks, one mark for each)

انقل الجدول الموضح ادناه في كراسة الاجابة واكتب به الاجابة الصحيحة

- 1- Linkers are short stretches of double stranded DNA that have recognition site for restriction enzymes and are ligated to blunt end DNA.
- 2- Select for proper ligation, bacteria should grow in a medium containing X Gal.

- 3- The gene of interest should be ligated where it should interrupt the lacZ gene.
- 4- tracrRNA is an RNA component required for the type II crisper system.
- 5- crRNA and tracrRNA can be combined in to a single RNA called sgRNA.
- 6- RISC is an enzyme that cleaves dsRNA into siRNA
- 7- Restriction enzymes belonging to type III cleave single stranded DNA only
- 8- For protein expression purposes it is preferred to clone from mRNA rather than genomic DNA
- 9- The initial step in RNAi involves a single *in vitro* transcription reaction
- 10- The replacement lambda phage vector has two restriction sites

1	2	3	4	5
6	7	8	9	10

III- Write the scientific term(s) that indicates the following sentences, (5 marks, one mark for each) انقل
 الجدول الموضح ادناه في كراسة الاجابة واكتب به الاجابة الصحيحة

- 1- Type of non-coding RNA (>100 nucleotides) has pivotal role in the regulation of gene expression.
- 2- Any process, other than splicing, that results in a change in the sequence of a RNA transcript.
- 3- The sequence of DNA found in the target DNA triggers "non-self activation", which prevents the systems from attacking its own CRISPR locus.
- 4- Clustered regularly interspaced short palindromic repeat associated protein.
- 5- A sequence in the vector allows plasmid to replicate in the host cell.

Quest. No.	1	2	3	4	5
Answer					

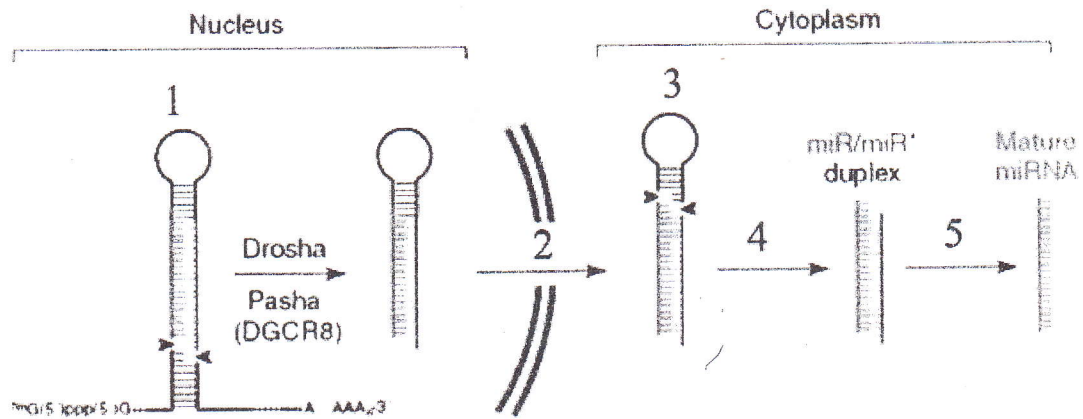
VI- Define Five only of the following terms

(5 marks, one mark for each)

- 1- Homologous recombination
- 2- Palindromic sequence
- 3- Competent cells
- 4- Zinc finger nucleases
- 5- Blunt cutters restriction enzymes
- 6- Chimeric organisms

V- Complete the missing labels of the following diagram. (5 marks, one mark for each)

انقل الجدول الموضح ادناه في كراسة الاجابة واكتب به الاجابة الصحيحة



Quest. No.	1	2	3	4	5
Answer					

IV- Write notes on three only of the following.

(15 marks, 5 marks for each)

- 1- Application of CRISPR/Cas9
- 2- C to U RNA editing
- 3- Detection mechanisms for plasmid vector uptake by host cells
- 4- Transcription activator-like effector nucleases

End of exam

Best wishes

Dr. Ahmed Moustafa

Dr. Abo Bakr Eltayeb



I- Choose the correct answer:

(15 Marks)

- 1- The phase of population growth cycle in which the number of cells lost by death and degeneration is greater than produced by cell divisions is known as:
a) decline phase b) lag phase c) exponential phase
- 2- 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
- 3- In death by suicide, the phagocytic cells secrete cytokines that:
a) activate cell death b) engulf the died cells c) inhibit inflammation
- 4- The phase of population growth cycle in which there is little or no increase in the number of population cells is called:
a) exponential phase b) lag phase c) cycle phase
- 5- Changes in temperature cycle, light cycle and chemical concentrations in a batch culture known as:
a) synchrony by induction b) synchrony by selection c) natural synchrony
- 6- The anterior chamber of the eye is immunologically privileged site because their cells express high levels of:
a) TNF- α b) Fas c) Fas L
- 7- The hallmark of AIDS is the decline in the number of patient's:
a) immune system b) T and B cells c) CD4⁺ T cells
- 8- Cell growth and protein production are stop at certain stage in the cell cycle. This stage is?
a) G₂ phase b) M phase c) G₁ phase
- 9- One of the human papilloma virus (HPV) products is a protein (E6) that binds and inactivates the apoptosis promoter →
a) P53 b) P58 c) P63
- 10- The various phases of the growth and reproduction of cells constitute what is called:
a) cell growth b) cell cycle c) cell division
- 11- In the programmed cell death, Bcl-2 is bound to a molecule of protein which called:
a) caspase 9 b) Apaf-1 c) TNF- β
- 12- The replication of the nuclear DNA occurs in the portion of the cell cycle known as:
a) interphase b) metaphase c) anaphase
- 13- In the death by injury, the cells and their organelles undergo changes like:
a) swell b) shrink c) both of them

14- When the population density is high enough for the cells to physically come into contact with each other; this phenomenon is called: _____

- a) continuous culture b) contact inhibition c) non- continuous culture

15- The generation time is the time required for the number of cells in the population to exactly: _____

- a) half b) one third c) double

II- Fill in the spaces

(10 Marks)

1- Growth factors include substances which many of the actions of hormones.

2- Testosterone supplementation might trigger excessive red blood cell production in some men which can increase a man's risk of.....

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

4- Proliferative genes, such as *c-fos* and others of its kind, are countered by

5- The Enzymes that do the unwinding the double-helical structure that makes up DNA called.....

6- In a process called, glucose molecules attach themselves to proteins that ends in the protein crosslinking.

7- The telomeres getat each time a cell divides.

8- The interleukin, rise with age, and it is speculated that interfere in some way with the immune response is called:

9- Melanoma cells avoid apoptosis by inhibiting the expression of the gene encoding

10- A free radical can be produced from almost any molecule when

III- Write the following data:

(17 Marks)

A- In gape 1 (G1) phase, cells are characterized by:

1-

2-

3-

B - In hormonal replacement, supplements of hGH can promote many problems as:

1-

2-

3-

4-

C- Calorically restricted animals live far beyond their normal lifespans due to the following:

1-

2-

3-

4-

5-

6-

D- Programmed cell death is needed to destroy cells that represent a threat to the integrity of the organism, For example:

1-

2-

3-

4-

IV-Answer two only of the following:-

(8 Marks)

1- DNA repair and synthesis.

2- Heat shock protein.

3- Proliferative genes.