



Answer the following questions with labeled drawing if they needed.

(NOTE: Exam in Two pages)

1- Choose the best correct answer (10 degree)

- 1- Placoid scale present in:
a- Lamprey
b- Tilapia
c- Dogfish
d- Frog
- 2- The primary gill rod encloses:
a- A blood vessel only
b- A blood vessel and coelomic canal
c- A coelomic canal Only
d- A central cavity only
- 3- The exoskeleton of the lamprey is:
a- Bony
b- Scaly
c- absent
d- cartilagenous
- 4- The circuli of the cycloid scales are used to determine the:
a. Nutrition value of fish
b. Sex of fish
c. Viability of fish
d. Age of fish
- 5- The number of voluntary muscles in frog are:
a- 200
b- 300
c- 400
d- 500
- 6- In fish gill rakers used in:
a- Feeding
b- Excretion
c- Respiration
d- Moving
- 7- Liver in bony fishes is:
a- 1 lobed
b- 3 lobed
c- 2 lobed
d- 4 lobed
- 8- The accessory organ of respiration in lung fishes is:
a- Swim bladder
b- Gills
c- lungs
d- urinary bladder
- 9- The third eyelid in frog is called:
a- Pineal eye
b- Upper eyelid
c- Over eyelid
d- Nictitating membrane
- 10- The teeth in frog are meant for:
a- Chewing
b- Preventing prey
c- Tearing
d- Cutting

2- Put ✓ or X in front of the following sentences and correct the wrong one: (10 degree)

1. Salivary gland in frog are 2 pairs
2. The eggs of fishes have extra embryonic membranes
3. In vertebrates, the pharyngeal gill slits are not more than 9 pairs
4. Tail in bony fishes is usually heterocercal
5. The teeth in dog fish are modified cycloid scales
6. Cloaca in bony fishes is lacking
7. Nostrils in dogfish are ventral and olfactory
8. The term vertebrata is synonymous to craniata
9. The lamprey larvae is called ammocoete
10. In frog respiration takes place by skin

3. Mention the function for EIGHT Only from the following structures:- (4 degree)

- | | |
|-------------------------------|--------------------------|
| 1. Wheel organ | 6. Ampullae of Lorenzini |
| 2. Cephalic pigments | 7. Air bladder |
| 3. Spiral valve or typhlosole | 8. Scales in fishes |
| 4. membranous labyrinth | 9. Tongue in frog |
| 5. Neruromast | |

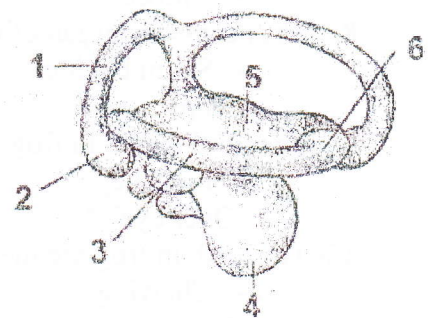
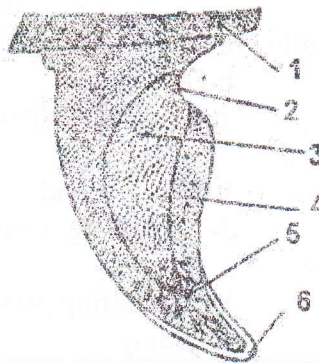
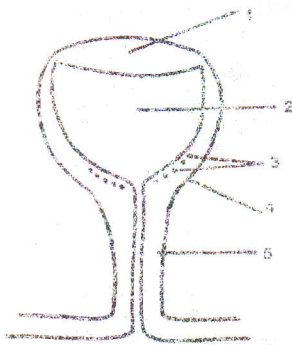
4. Answer Five only of following themes including numbers 2 and 5 mandatory: 10 degree

1. Describe the Venous System of Lamprey ONLY by drawing
2. Draw well labeled diagram of Dog fish skull
3. State the different types of caudal fins or tails in fishes.
4. Diagrammatically show the different types scales in fishes.
5. Draw the pentadactyl limb structure in the vertebrates.
6. Explain the sexual dimorphism in dogfish.

5. Mention FIVE differences for three ONLY from the following pairs (6 degree)

- 1- Agnatha and gnathostomata.
- 2- Cartilaginous fishes and Bony fishes.
- 3- Lower vertebrates and higher vertebrates.
- 4- Hemichordate, Urochordate, and Cephalochordate

6. Define and label each of the following structures: (10 degree)



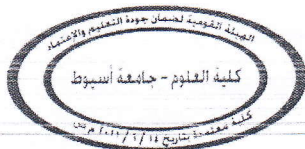
1-..... 2-..... 3-.....

Best wishes.....

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Assiut University
Faculty of Science
Zoology Department
Chem. & zoology



Time: 2 hour
Level: two
Course Code: 210Z

Second Semester Cytology Exam (09/06/ 2019)
Answer the following questions: (50 marks)

I: Choose the best single correct answer (10 marks)

1-Which of the following is NOT a principle of the cell theory?

- a) Cells are the basic units of life
b) All living things are made of cells
c) Very few cells are able to reproduce
d) All cells are produced from existing cells.

2-More kinks in the tails of phospholipid molecules in the plasma membrane leading to.....

- a) Less fluidity b) More fluidity c) Neutral of fluidity d) Prevention of fluidity

3-.....is a spherical vesicle having at least one lipid bilayer and prepares by disrupting membranes.

- a) Liposome b) Vacuoles c) micelle d) lipids bilayer

4-Transmembrane linker of desmosomes junction is.....

- a) Cadherin b) Integrins c) connexons d) collagen

5-.....is to provide mechanical support for the plasma membrane where it comes into contact with other cells or with the extracellular matrix.

- a) Microfilaments b) Cilia c) Intermediate filaments d) flagella

6-.....It is a growth whose rate becomes ever more rapid in proportion to the growing total number or size.

- a) The lag phase b) exponential phase c) The stationary phase d) death phase

7-Contain amino oxidase and hydroxyacid oxidase all these enzyme reduces oxygen and H_2O_2 .

- a) Lysosome b) Secretory granules c) Ribosomes d) Microbodies

8- During which stage can crossing over occur?

- 6- During which stage can crossing over occur:
- a) Prophase 1 (meiosis)
 - b) Gap 2 Phase (either mitosis or meiosis)
 - c) Telophase (either 1 or 2 during meiosis)
 - d) Metaphase (mitosis)

9- What is the purpose of the G1 Phase?

9. What is the purpose of the G1 phase?
- a) Cell grows and prepares to replicate DNA
b) Cell grows and checks for mistakes in DNA replication
c) Cell rests and does not need to divide
d) DNA is replicated

10- Ribosomes were known as in glandular cells.

- 10- Ribosomes were known as in glandular cells.
a) Basophilic bodies b) Ergastoplasm c) Nissl bodies d) Zymogen granules

II: Put (✓) in front of the correct answer and (×) in the front of wrong answer (6 marks)

11. Put (✓) in front of the correct answer and () in the front of wrong answer.
- 1-Cells contain hereditary information which passes to cell during cell division. ()
 - 2-Viruses are considered not alive by definition of the cell theory. ()
 - 3-In eukaryotic transcription and translation occurs in the cytoplasm. ()
 - 4- There are 4 major phospholipid in the plasma membrane have choline bearing. ()
 - 5-Tight junction Integral membrane proteins connect a cell's cytoskeleton to another cell or extracellular matrix. ()
 - 6- Type of nucleus in which there is a large amount of nuclear sap known as the condensed nucleus. ()
 - 7-Metaphase phase is the longest stage of the cell cycle. ()
 - 8- The glucose molecule is split into two parts of pyruvate by glycolysis in the mitochondria. ()
 - 9-Leading strand: is synthesized continuously in the 5' → 3' direction toward the replication fork. ()
 - 10-Deoxyribose is the sugar present in the nucleotide DNA. ()

- 11-Extracellular matrix is a complex network of proteins, glycosaminoglycans and two proteoglycans. ()
- 12-Osmosis is known as the transport of water across cell membrane from low to high solute concentration. ()

II: Complete the following sentences (6 marks)

1. The process of making an mRNA strand from a DNA template is called.....while the process of using an mRNA to make a protein is called.....
2. Extending from the surface of cilia pairs of arms formed by the protein, which has ATPase activity.
3.a sequence of three nucleotides at the bottom of tRNA, which is complementary to three bases in mRNA. Also, Translation takes place in the.....
4. And..... are Types of Regulatory Molecules, together act as a checkpoint.
5. includes most of the active genes that are transmitted through different generations.
- 6.....are the number and appearance of chromosomes in the nucleus of a eukaryotic cell.
7. Organisms that have 2 identical alleles for a trait are calledandthe overall effect of a gene is known as.....
8. The last phase of mitosis is known as.....

III- Write the scientific name for each of the following descriptions (6 marks)

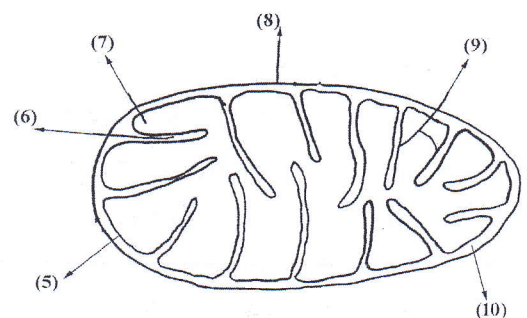
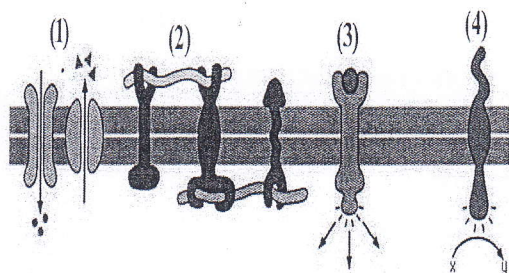
- 1- Organic macromolecules contain double bonds in the Acyl chain and Have a lower melting point. (.....)
- 2- Any one of a number of alternative forms of the same gene occupying a given locus. (.....)
- 3- Bodies accumulated in long life cells as heart or liver cells forming what is known as lipofuscin or age pigment (.....)
- 4- Cellular organelles are not engaged yet in digestion event characterized by its small size, obvious membrane with uniform granular contents. (.....)
- 5- Nucleotides are required to start the synthesis of both daughter strands also they are short sequence. (.....)
- 6- The cell cycle is regulated by a molecular signaling system which switches the cell cycle control system on/off.(.....)

IV-Answer Five only of the following (10 marks)

- (1)Write differences between Prokaryotes and Eukaryotes chromosomes.
- (2) Write and draw difference between types of junction according their function.
- (3) Explain in detail the steps of how are mitochondria organized to be powerhouse?
- (4) Write and draw about posttranslational modifications and packages of Golgi apparatus.
- (5) Briefly, explain steps of synthesis of ribosomes and protein.
- (6)Explain names and functions of the enzymes involved in DNA replication.

V- Answer the following (12 marks)

- 1) Identify the diagram (a & b)
- 2) write labels from (1 to 10)



With my best wishes

Dr. Mona M. Atia



**Final Exam of Histology & Histopathology (212 Z)
for second year Students (credit hours)**

Part I – Histology

I-Choose the most appropriate answer for each of the following statements: (10 Marks)

- 1- What do you call the simple squamous epithelium that lines the abdominal cavity?
a. Epithelioid tissue b. Mesothelium c. Endothelium
d. Transitional e. Pseudostratified
- 2- According to the mode of secretion (changes in the secretory cells), glands are classified into:
a. Exocrine and endocrine b. Merocrine, apocrine and holocrine
c. Unicellular and multicellular
- 3- Which cell is a connective tissue fixed macrophage?
a. Kupffer cells b. Histiocyte c. Dust cells
d. Langerhans cell e. Microglia
- 4- Which cell type forms the myelin sheath around myelinated axons in the central nervous system?
a. Ependymal cell b. Oligodendrocyte c. Schwann cell d. Microglial cell
- 5- Nervous tissue cells that play several supporting roles but do not transmit impulses are called:
a. Glial cells b. Dendrites c. Nerve cells d. Neurons
- 6- The minute passageways in the bony matrix that allow osteocytes to communicate with each other are called:
a. Lamellae b. Osteons
c. Lacunae d. Canaliculi
- 7- What is the surface modification seen on the cells of the epididymis?
a. Microvilli b. Stereocilia
c. Cilia d. Both a & b
- 8- Which part of the alimentary canal is lined by stratified squamous epithelium?
a. Stomach b. Nose, nasal cavity, respiratory segment
c. Gall bladder d. Oesophagus

9- Which if the following is highly vascularized?

- a. Cartilage
- b. Simple epithelium
- c. Stratified epithelium
- d. Areolar connective tissue

10- Sarcoplasmic reticulum found in:

- a- Liver cells
- b. Nerve cells
- c. Muscle cells

II- Complete the following sentences: (10 Marks)

1- Epithelial cells specialized for sensory reception are called
while those forming secretory units constitute

2- The functions of the fibroblast are:

- a.
- b.
- c.

3- Osteoclast cells are formed by fusion of

4- When many processes arise from the body of the neuron, the neuron is called:
.....

5- Type I collagen is present in,,
..... This type is formed by,
.....

6- The types of connective tissue proper are:

- a. c e.....
- b. d f.....

7- Naked nerve fiber means

III- Answer only one of the following with drawings: (5 Marks)

1- Structure and function of neuroglia proper

2- Differences between bone and cartilage

Part II – Histopathology

IV- Choose the correct statement from column B that matches the terms in column A and write your answer in the table below. **(15 Marks)**

A		B									
1. Pyknosis		1. Pathological accumulation of excess neutral fat in parenchymatous cells.									
2. Cloudy swelling		2. The causes of any disease.									
3. Etiology		3. Characterized by excess water accumulation inside the cells forming vacuoles in the cytoplasm.									
4. Involution		4. A local death of cells or tissues within living body caused by severe physical and chemical insult.									
5. Karyolysis		5. Characterized by swelling of the cell and granularity of the cytoplasm									
6. Haemorrhage		6. In which the nucleus shrinks, its chromatin becomes dense and it stain darkly.									
7. Fatty changes		7. Escape of blood outside the blood vessels.									
8. Hydropic degeneration		8. The nucleus appears to dissolve and fails to take the stain due to chromatic hydrolysis.									
9. Necrosis		9. Increase in the size of the cells.									
10. Hypertrophy		10. Decrease in the number of cells.									
Column A	1	2	3	4	5	6	7	8	9	10	
Column B											

V. Complete the following statements:

(10 Marks).

1. Inflammation is defined as (2)

.....

2. Repair is defined as (2)

3. Causes of necrosis are: (3)

a.

b.

c.

4. Types of inflammation include: : (3)

a.

b.

c.



Faculty of Science

Assiut University

Dept. of Zoology

Exam of Animal Ecology Code No. 225Z

Credit hour system 2nd level. June 2019

Answer the following questions:

A- Choose the suitable number from Column (A) and write it in the column (B): (10 marks)

A	B	
1-The community	+ Occurs when the position of each individual is independent of the others.	
2- The ecosystem	+ Are those that feed on dead organisms	
3-The biosphere	+ Include all invertebrates	
4-The abiotic factors	+ Depend on internal heat production	
5-Recycling of materials	+ May affect the elements of the ecosystem by eliminating some organisms	
6-The photoperiod	+ Is the ability of the organism to reproduce successfully	
7- Predators	+ Is reproductively isolated from other such group	
8-Scavengers	+ Are those which feed on the remains of animals they did not kill	
9- The population	+ Are those which kill and consume their prey	
10-Fitness	+ Is a factor that affects the biological activities of animals	
11-Reproductive effort	+Is considered one of the positive impacts of man	
12-The canopy	+ Is considered one of the negative impacts of man	
13-Consumers	+ Include all heterotrophic organisms	
14-Exploitation	+Is the primary site of energy fixation	
15- Species preservation	+ Is the energy spent by the organism in reproduction	
16-Thermal pollution	+Is considered one of the requirements of stable ecosystem	
17-Homeotherms	+ Include the physical and chemical ones	
18-Ectothermy	+ Is the portion of the earth in which life exists	
19-Saprophytes	+ Is the functional unit studied in ecology.	
20-Random distribution	+ Includes the biotic factor of the ecosystem	

B- Write the scientific term of the following: (10 marks)

- 1-A type of reproduction in which the ova develops without fertilization.
- 2- The maximum rate at which a population can increase under ideal conditions.
- 3-The first organism to populate an area.
- 4-The role played by the organism.

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- 5-A biome in which Egypt is found.
- 6-A type of competition in which some individuals claim enough resources while denying others a share.
- 7- An individual female gains two or more males.
- 8-The number of births in a given time period.
- 9-The situation in which an animal defends an exclusive area not shared with rivals.
- 10-A substance reserved in the hump of the Camel.

C- Give reasons for each of the following: (15 marks)

- 1- Some ecosystems can exist in the deep oceans in spite of the absence of sun.
- 2-About 30% of solar radiation reflects again into sphere.
- 3-Considering temperature as a factor studied intensively.
- 4-Death of organisms at High temperature.
- 5- Camels can conserve water in their bodies.
- 6-Considering some animals parasitic while others are mutual.
- 7-Considering distribution of some animals aggregated.
- 8- Animals cannot increase with their biotic potential.
- 9- Considering decomposers very important for ecosystem.
- 10-Considering Egypt in the desert biome.
- 11- Thermal pollution of some rivers.
- 12-Considering temperature with a bifold effects on animals.
- 13- Reproduction of goats in certain time of the year.
- 14-Considering some places very humid while others are dry.
- 15- Ability of some soil animals to withstand high temperature.

D- Choose the correct answer from the following (5 marks):

- 1-The visible light includes (Ultra violet light-Infra red-the well known 7 colors).
- 2-The dominant species is that (possesses the highest biomass- occupies the most space - makes the largest contribution to energy flow - all)
- 3- Light affects (the behavior of animals- morphology-both).
- 4-Eutherms are (widely distributed-restricted in their distribution-both).
- 5- The temperature affects (the physiology of animals- morphology- both).
- 6- A few numbers of young is characteristic of (short lived animals – long lived animals – both).
- 7- The organisms that eat other organisms are known as (decomposers- Producers - consumers).
- 8- The negative impact of man includes (overhunting- Species preservation- biological control-all).
- 9- The ecosystem includes (the biotic factors- the abiotic factors- both)

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10- Thermal pollution causes (increasing of parasites – increasing of temperature downstream of the dams – both).

E- differentiate between the following (10) وضع الفرق بين كل مما يلي
marks)

- 1- Intraspecific competition and interspecific competition.
- 2- The theory of Coexistence and that of exclusion.
- 3- Niche and density.
- 4- Territory and range of tolerance
- 5- Parasitism and Cannibalism.

Good Luck



University: Asyut

Invertebrate II

Total degree = 50

Faculty: Science

Code: 222 Z

Final exam.

Department: Zoology

June 2019

Time: 2 hrs.

The questions are in 2 pages

Q1. A: Give the reason (s):

(10 marks)

- 1- *Iulus* can protect itself from predation.
- 2- Echinoderms are important both biologically and geologically.
- 3- *Squilla* can move efficiently and quickly.
- 4- Aeolids are similar to Cnidaria.
- 5- Arthropods are successful.
- 6- Mollusks' mantle is very important.
- 7- Feather Stars' pinnules are important in feeding.
- 8- *Strombus* has asymmetrical visceral mass.
- 9- The ability of *Nautilus* to float.
- 10- Although the absence of radula, *Anodonta* can grind its food.

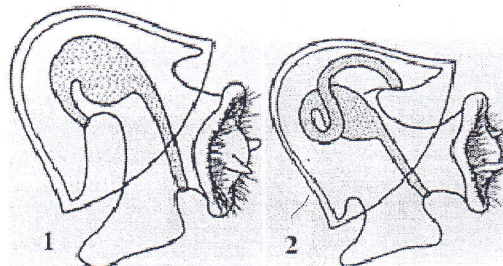
B: Examine the opposite figures and answer the following:

(3 marks)

I- Name this phenomenon.

II- Its results.

III- Name the phylum.



Look behind please!

Q2. Answer six only of the following:

(24 marks)

- 1- Compare between *Nautilus* & *Octopus*.
- 2- List the characteristics of crustacean.
- 3- Only draw with labeling the blood circulation in both *Buthus* & *Anodonta*.
- 4- Illustrate structure & importance of arthropods' exoskeleton.
- 5- Classify Mollusca & give an example for each group.
- 6- Compare the nervous systems in both *Penaeus* & *Sepia*.
- 7- Illustrate the reproduction in both *Lycosa* & *Eremina*.

Q3: Correct over the line:

(13 marks)

- 1- *Dentalium* belongs to Euphausiacea.
- 2- Brittle stars are protostomes.
- 3- Fertilization occurs in *Octopus*' supra branchial chamber.
- 4- WVS is unique system in Cyclops.
- 5- Torsion in Mollusca doesn't affect the symmetry.
- 6- Limestone in the earth is formed by captacula.
- 7- Pearls are functional regions formed by fusion of segments.
- 8- *Peripatus* is similar to Echinodermata.
- 9- Chiloplopods are marine, benthic chelicerates with long legs.
- 10- Unio can engulf large & strong preys.
- 11- Detorsion occurs in Prosobranchia.
- 12- Mucous nets were produced above gymnosomes.
- 13- Gammarus can return to life from zero metabolism.

----- End -----

هناء عاطف جودة

بالتوفيق و السداد

Answer the following questions (50 marks):

A- Write an essay on the steps of studying food and feeding habits of a fish and what are the precautions and factors to be in consideration? (5 marks).

B- Label the correct statement with True (T) and the incorrect one with False (F) with correction of the false (5 marks):

1. Growth rate of immature fish are much faster than those of mature fish. (-----)
2. Cyclostomata have paired gonads with gametes released into body cavity. (-----)
3. In positive allometric growth, the shape of fish changes over time. (-----)
4. In dry fertilization the sperm is added to the eggs after water. (-----)
5. Amazon River fish switch from invertebrates to detritus in the rainy season. (-----)
6. Stenohaline tolerate a narrow range of salinities in external environment - either marine or freshwater ranges (-----)
7. The clithrum and opercular bones are suitable for age determination. (-----)
8. Freshwater bony fish are hyperosmotic facing challenge to homeostasis: constant loss of water from body to environment by osmosis (-----)

9. Herbivores are represented by > 5% of all bony fishes. (-----)
10. In Euryhaline bony fish, hormone-mediated changes are associated with metamorphosis - convert from freshwater adaptations to saltwater or vice versa, depending on direction of migration (-----)
11. Scavengers are represented by 5-10% of all fish species. (-----)
12. In freshwater Chondrichthyes, rectal gland is reduced, but present and urine flow is low. (-----)
13. In the most highly evolved Elasmobranches, the anterior end of the premaxilla develops what's called an ascending process. (-----)
14. Hagfishes and lampreys have been assigned to separate Craniate classes, which means that the name "Agnatha" is a paraphyletic assemblage of jawless fishes. (-----)
15. The primitive gape and suck feeding mechanism as in *Elops* provide the raw material for the evolution of protrusible jaws. (-----)
16. Chondrichthyes have internal fertilization, but sharks may be oviparous, ovoviviparous, or viviparous. (-----)
17. Instead of a toothed mouth, the jaws of chimaeras bear large flat plates in their jaws, the upper one of which is completely fused to the cranium. (-----)
18. *Micropterus salmoides* consumes food at 10C three times than that in 20C. (-----)
19. When the allometric coefficient is equal 3, large specimens with fusiform body are in better condition than small ones. (-----)
20. Fishes with high RGL = species consuming detritus and algae with high proportion of indigestible matter. (-----)

C- Choice the correct answer of each list in the following (15 marks):

- 1- **Pituitary growth hormone in fishes leads to:**
 - a) increases appetite and increases food conversion efficiency
 - b) decreases production of somatomedin
 - c) both of a & b
 - d) nothing of the above
- 2- **Anabolic steroids stimulate growth including:**
 - a) testosterone and estrogen
 - b) progesterone
 - c) corticosteroids
 - d) both of a & c
- 3- **Wintering migration includes:**
 - a) Cata- and ana-dromous migrations
 - b) Potamo- and oceano-dromous migrations
 - c) All the above
 - d) Nothing of the above
- 4- **Gametic migration includes:**
 - a) Cata- and ana-dromous migrations
 - b) Potamo- and oceano-dromous migrations
 - c) All the above
 - d) Nothing of the above
- 5- **Protection mass movements of fishes includes:**
 - a) Spawning and wintering migrations
 - b) Feeding migration
 - c) All the above
 - d) Nothing of the above
- 6- **Maturity stage 1 is concerned with**
 - a) Oocyte development
 - b) Vitellogenesis
 - c) Oocyte maturation
 - d) Spawning
- 7- **Maturity stage 3 is concerned with**
 - a) Oocyte development
 - b) Vitellogenesis
 - c) Oocyte maturation
 - d) Spawning
- 8- **The food supply is a determining factor of:**
 - a) Distribution and abundance
 - b) Condition and rate of growth
 - c) Migration and fertility
 - d) All the above
 - e) Nothing of the above
- 9- **The length-weight relationship is negative allometric when the allometric coefficient is:**

- a) Less than 3
- b) Larger than 3
- c) Equal to 3
- d) Nothing of the above

10- The length-weight relationship is positive allometric when the allometric coefficient is:

- a) Less than 3
- b) Larger than 3
- c) Equal to 3
- d) Nothing of the above

11- Europhagous plankton feeders have:

- a) Mixed diet.
- b) A limited sort of food.
- c) One sort of food.
- d) Nothing of the above

12- Maturity stage 4 is concerned with

- a) Oocyte development
- b) Vitellogenesis
- c) Oocyte maturation
- d) Spawning

13- Oocyte maturation in fishes includes:

- a) Germinal vesicle (nucleus) migration
- b) Resumption of meiosis (cell division)
- c) Water uptake
- d) All the above

14- Advantages of indeterminate growth in fishes includes:

- a) Greater efficiency and more food options
- b) Faster swimming and larger gape size
- c) Better sensory range
- d) All the above
- e) Only a&c

15- Maturity stage 2 is concerned with

- a) Oocyte development
- b) Vitellogenesis
- c) Oocyte maturation
- d) Spawning

16- The length-weight relationship is isometric when the allometric coefficient is:

- a) Less than 3
- b) Larger than 3
- c) Equal to 3
- d) All the above
- e) Nothing of the above

17- Length-scale relationship can be expressed in the following formula:

- a) $W = a * L^b$
- b) $\log_{10} W = \log_{10} a + b * \log_{10} L$
- c) Both of a& b
- d) Nothing of the above

18- Stenophagous plankton feeders have:

- a) Mixed diet.
- b) A limited sort of food.
- c) One sort of food.
- d) Nothing of the above

19- Energy used to maintain fish healthy is affected by:

- a) Temperature
- b) Dissolved oxygen
- c) Toxins
- d) All the above
- e) Both of a&c

20- Monophagous plankton feeders have:

- a) Mixed diet.
- b) A limited sort of food.
- c) One sort of food.
- d) Nothing of the above

21- Teeth in piscivorous fishes are

- a) Strong and a cutely pointed.
- b) Single plate
- c) Nibbling mouth with incisiform teeth.
- d) Small teeth feeble.
- e) Toothless mouth but with pharyngeal teeth and horny pad.

22- Teeth in molluscivorous fishes are:

- a) Strong and a cutely pointed.
- b) Single plate
- c) Nibbling mouth with incisiform teeth.
- d) Small teeth feeble.
- e) Toothless mouth but with pharyngeal teeth and horny pad.

23- Teeth in plankton feeder fishes are:

- a) Strong and a cutely pointed.

- b) Single plate
- c) Nibbling mouth with incisiform teeth.
- d) Small teeth feeble.
- e) Toothless mouth but with pharyngeal teeth and horny pad.

24- Teeth in herbivorous fishes are:

- a) Strong and a cutely pointed.
- b) Single plate
- c) Nibbling mouth with incisiform teeth.
- d) Small teeth feeble.
- e) Toothless mouth but with pharyngeal teeth and horny pad.

25- Teeth in scavenger fishes are:

- a) Strong and a cutely pointed.
- b) Single plate
- c) Nibbling mouth with incisiform teeth.
- d) Small teeth feeble.
- e) Toothless mouth but with pharyngeal teeth and horny pad.

26- Overfished stocks have:

- a) Fast growth and good condition
- b) Small average size of fish caught
- c) Both a&b
- d) Nothing of the above

27- Flying fishes have modified fins that help them glide. These are:

- a) pelvic fins
- b) caudal fin
- c) pectoral fin
- d) all of the above

28- Schreckstoff is

- a) The fear hormone

- b) A high latitude freshwater fish
- c) Used in sexual selection
- d) An adaptation to cold water

29- **Fish drinks water, urinates little and expels extra salts via the chloride cells. This scenario describes the osmoregulation strategy of a**

- a) Shark
- b) Freshwater bony fish
- c) Marine bony fish

- d) Lamprey

30- **In cartilaginous fishes, body fluids are isosmotic with environment due to:**

- a) Mineral concentration = 500 mOsm/l
- b) Urea 440 mOsmol/l
- c) Trimethyl Amine Oxide = 70 mOsmol/l
- d) All the above

D- Write the term or the identification of term in the blank cell of the following table? (5 marks):

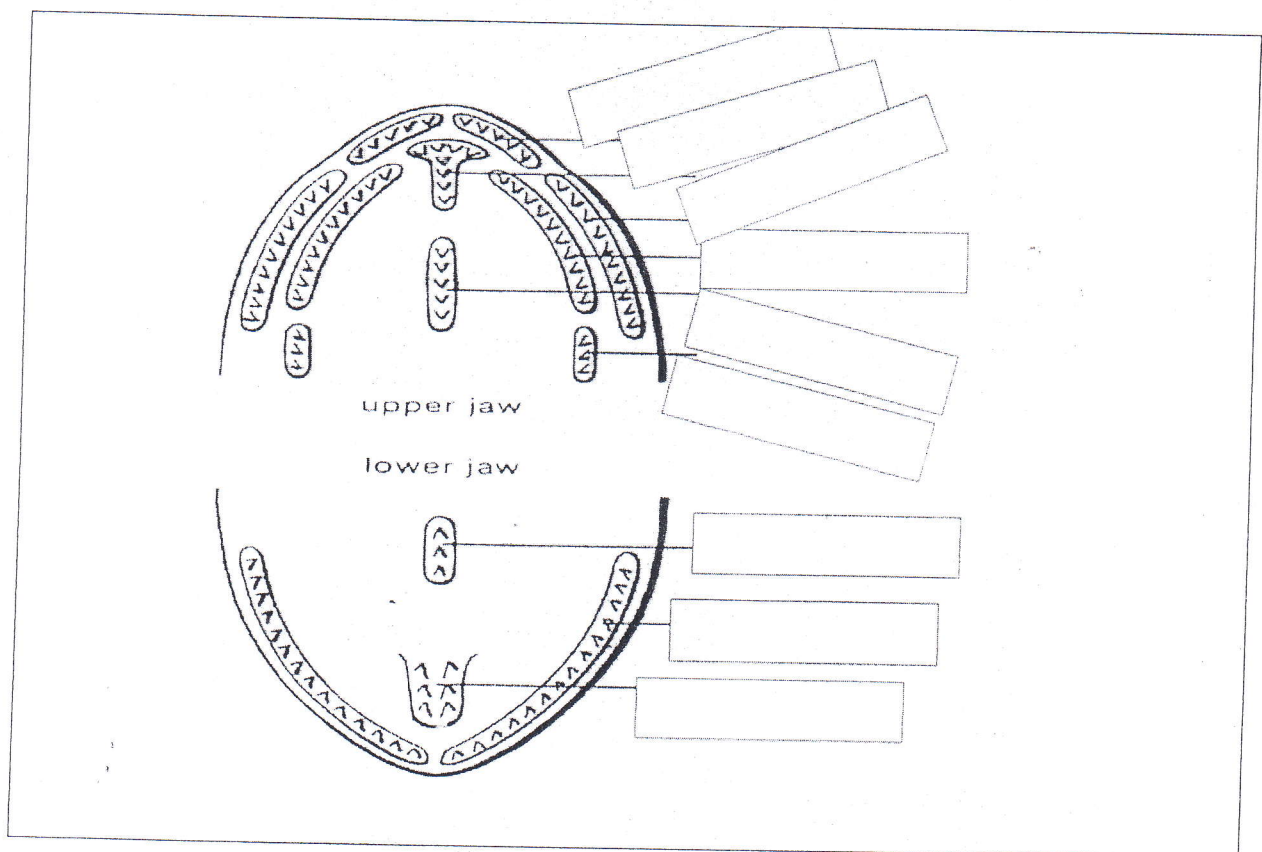
Term	Identification
1.	A structure designed to allow fish the opportunity to migrate upstream over a barrier to fish movement.
2. Gonadosomatic index	
3.	Spawners in which eggs to be spawned not all are present as oocytes in ovary prior to spawning
4. Semelparity	
5. Von Bertalanffy Growth Function	
6. Lee's phenomenon	
7. Relative weight condition factor index	
8.	Migratory, confined to sea only, eg. Tunnas, Mackerels
9. Osmoconformers	
10. Bhattacharya method	

1. What are the anatomical requirements and feeding strategies for a fish to be called herbivores? Mention examples? (4 marks)

8

3. Identify fecundity and its relationship with fish size? What are implications in their estimation? Summarize maturity stages and the internal mechanism of reproduction regulation? (3 marks)

4. Write a title to the following figure with labels? (3 marks)



5. Enumerate the methods of growth rate measurements with criteria of back-calculations and associated equations used? (3 marks)
6. Mention the synapomorphic characteristics of Teleostei? (3 marks)

7. Mention different factors influencing mass movements of fishes and the role of hormones? (3 marks)
8. Write short note on Chondrichthyes success during evolution? (3 marks)

9. Write short note on the alimentary tract adaptations in fishes according to their food and feeding habits? (3 marks)

10. Write on fish fecundity methodology and the assumptions to use population fecundity as a measure of reproductive potential? (3 marks)

-----BEST WISHES- IMAM MEKKAWY-----