JOINT UNIVERSITIES PRELIMINARY EXAMINATIONS BOARD

JUNE 2020 EXAMINATIONS

JUPEB/003E

BIOLOGY **SCI-J152** **TIME ALLOWED: 3 hours**

SECTION A: MULTIPLE CHOICE QUESTIONS

Answer all questions in this section.

Use the OMR answer sheet provided to answer the questions, follow the instructions on the OMR sheet.

SECTION B: ESSAY QUESTIONS

Answer FOUR Questions in ALL; ONE from each Course.

SECTION A: MULTIPLE CHOICE QUESTIONS.

Answer all questions in this section.

1. Antonie van Leeuwenhoek first observed microorganisms in 1674 and called them …
   A. microbes.
   B. cells.
   C. bacteria.
   D. animalcules.

2. The name 'Enterobacteriaceae' denotes a bacterial …
   A. Class.
   B. Division.
   C. Order.
   D. Family.

3. Choose the option below that is not correct about fungal groups.
   A. Deuteromycetes are fungal groups that form asexual spores.
   B. Oomycetes fungal groups that form asexual spores.
   C. Basidiomycetes fungal groups that form asexual spores.
   D. Zygomycetes fungal groups that form asexual spores.

4. The process of photosynthesis takes place in the _____ of the leaves.
   A. stomata
   B. chloroplast
   C. mesophyll
   D. vascular bundle

5. The by-product of light-dependent reaction of photosynthesis is …
   A. H_2O B.
   B. CO_2.
   C. O_2.
   D. ATP.

6. The internal changes that seeds pass through before they start germinating is known as …

A. after-ripening.

B. dormancy.

C. sprouting.

D. fertilization.

7. One of the following statements is correct about Bryophytes and Pteridophytes.

A. The organ of anchorage are rhizoids and roots respectively.

B. Bryophytes are terrestrial while Pteridophytes are amphibious.

C. Bryophytes have complex body structures while Pteridophytes have simpler body structures.

D. Bryophytes and Pteridophytes possess rhizoids.

8. One of the importance of mosses is that

A. they initiate soil erosion.

B. they reduce soil quality.

C. they initiate soil formation.

D. they serve as source of income.

9. A cell that has thin cell walls, dense cytoplasm, small sized vacuoles and capable of dividing is likely to be a

A. meristematic cell.

B. secondary cell.

C. lateral cell.

D. differentiated cell.

10. The floral leaves of a typical flower are divided into four parts where the sepals form the

A. corolla.

B. calyx.

C. androecium.

D. gynoecium.

11. When the sepals of a flowering plant are separated from each other, such plant is referred to as a

A. gamosepalous plant.

B. monosepalous plant.

C. heterosepalous plant.

D. polysepalous plant.

12. The mass flow of sap through sieve elements is described as an active process because

A. sucrose moves out of the phloem into area of cell multiplication.

B. phloem sap is capable of moving in the sieve elements against the force of gravity.

C. sucrose is loaded into a sieve element against the concentration gradient.

D. water moves along with the sucrose down the concentration gradient.

13. The rate of diffusion is inversely proportional to the

A. size of diffusing molecules and concentration gradient.

B. size of diffusing molecules and surface area of the cell involved.

C. size of diffusing molecules and density of the diffusing molecules.

D. size of diffusing molecules and temperature in the cell involved.

14. When the filaments of stamens are attached to the petal, the flower is referred to as

A. epipetalous.

B. gamopetalous.

C. polypetalous.

D. monopetalous.

15. In seed vascular plants, the first fertilization occurs

A. when two nuclei fuse together to form a zygote.

B. when one nucleus fuses with the ovum to form a diploid cell.

C. when one nucleus fuses with the ovum to form a zygote.

D. when two nuclei fuse together to form a diploid cell.

16. Body segmentation is pronounced in the following groups of animals except

A. Arthropoda.

B. Chordata.

C. Annelida.

D. Coelenterata.

17. The Sarcodinea are very unique with the presence of
    A. ciliated body.
    B. long flagella.
    C. amorphous body structure.
    D. binucleated cytoplasm.

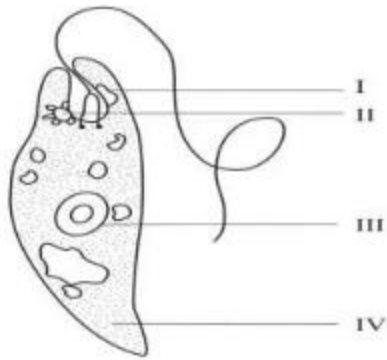
18. Which of the listed phyla is referred to as a dead end phylum?
    A. Coelentrata.
    B. Annelida.
    C. Porifera.
    D. Arthropoda.

19. Sexual maturity of animal parasites is attained in the
    A. reservoir host.
    B. definitive host.
    C. primary host.
    D. intermediate host.

20. A mantle and mantle cavity are present in the class
    A. Oligochaete.
    B. Bivalvia.
    C. Polychaeta.
    D. Hirudinea.

21. The believe that certain living things arose from vital forces present in non-living or decomposing matter is known as
    A. initial generation.
    B. biogenesis.
    C. spontaneous generation.
    D. induced generation.

Use the diagram below to answer questions 22.



22. The part labeled II is the

A. nucleus.

B. eyespot.

C. basal granule.

D. contractile vacuole.

23. Which of these cell structures can be seen only with an electron microscope?

A. Cell surface membrane.

B. Chromosome.

C. Nucleolus.

D. Vacuole.

24. Which of the following are found in both eukaryotic and prokaryotic cells?

I. Cellulose II. Deoxyribose III. Lipids IV. Ribose.

A. I, II and III.

B. I, II and IV.

C. I, III and IV.

D. II. III and IV.

25. Which of the following listed organisms is a multicellular organism?

A. *Rhizopus.*

B. *Euglena.*

C. *Paramecium.*

D. *Chlorella.*

26. Birds and mammals have certain shared characteristics. Which of these is not a shared characteristic?

A. Ossified endoskeleton.

B. Breathing using lungs.

C. Viviparity.

D. Warm blooded.

27. Choose the option that is associated with an open vascular system.

A. Man.

B. Fish.

C. Prawn.

D. Snakes.

28. Choose the option that is associated with the measuring of the pulse beat.

A. Artery.

B. Vein.

C. Capillary.

D. Nerves.

29. Study the options carefully and identify the organism that excretes uric acid as its main nitrogenous waste.

A. Frog.

B. Birds.

C. Fishes.

D. Man.

30. Study the options A to D carefully. Identify the cells which secrete the male sex hormone, testosterone.

A. Isthmus.

B. Cryptic cells.

C. Lieberkiihn.

D. Leydig's cells.

31. Which of the options below best describes an electron microscope in comparison with a light microscope?

OPTION	MAGNIFICATION	RESOLUTION
A.	Higher	Higher
B.	Higher	Lower
C.	Lower	Higher
D.	Lower	Lower

32. Study the table below and choose the option which does not tally.

OPTION	ANIMAL	EXCRETION/EXCRETORY STRUCTURES
A	*Hydra*	Diffusion
B	*Planaria*	Flame cells
C	Earthworm	Nephridia
D	Cockroach	Spiracles

33. Which of these is the intermediate host of *Fasciola*?

A. *Lymnaea truncatula.*

B. *Pila globosa*

C. *Lamellidens marginalis.*

D. *Achatina achatina.*

34. Which of the following is contrary to the rules of nomenclature?

A. Biological names can be written in any language.

B. The first word in a biological name represents the generic name, and the second is a specific name.

C. The names are written in Latin and are italicized.

D. When written by hand, the specific names are to be underlined.

35. Identify the animal from option A to D that is not viviparous.

A. Elephant.

B. Platypus.

C. Whale.

D. Flying fox.

36. Students in a biology class were asked to use the following information to draw a bar chart to show number of babies born in twelve villages on a certain day:

No. of babies:	4	5	6	7	8
No. of Villages:	1	4	2	3	2

Choose the option that could be a suitable title for the graph.

A. Graph of number of babies against number of villages.

B. Graph of number of villages against number of babies.

C. Bar chart showing number of babies against number of villages.

D. Bar chart showing number of villages against number of babies.

37. What is the ecological definition of the term community?

A. All the food web in an ecosystem.

B. All the individuals of one species in an area.

C. All the organisms in an area.

D. All the biotic and abiotic components in an ecosystem.

38. The difference between the smooth endoplasmic reticulum and the rough endoplasmic reticulum is that

A. the smooth synthesises steroids, while the rough assembles protein.

B. the smooth assembles protein, while the rough synthesizes steroids.

C. the smooth distributes steroids, while the rough distributes protein.

D. the smooth distributes protein, while the rough synthesizes steroids.

39. Identify the option that is not an anti sera used in blood grouping.

A. Anti sera A.

B. Anti sera B.

C. Anti sera C.

D. Anti sera D.

40. Identify the odd ecological instrument from the options given below.

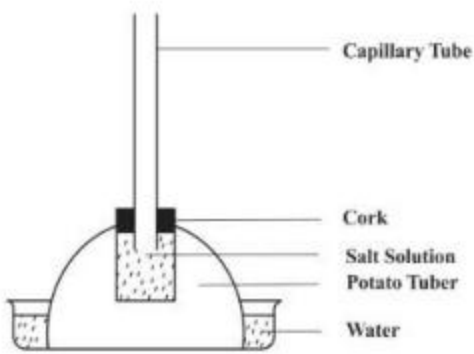
A. Barometer.

B. Ecological meter.

C. Meter rule.

D. Anemometer.

41. The diagram below shows the description of an experiment to demonstrate osmosis. Choose the option that best describes the direction of flow of water.



A. Water will move from the capillary tube to the beaker.

B. Water will move from the beaker to the capillary tube.

C. Water will move from the potato tuber to the beaker.

D. Water will move from the beaker to the potato tuber.

42. In mushroom, the function of the gills is to produce spores. Choose the option below that best describes the function of the hyphae.

A. It assimilates the nutrients in the substrate.

B. It absorbs nutrients from the substrate.

C. It digests the nutrients in the substrate.

D. It is the storage organ for carbohydrates produced by the mushroom.

43. Which of these is a xerophyte?

A. Cactus.

B. Moss.

C. Fern.

D. Bryophylum.

44. Which of the following is not true of Bryophytes?

A. Possession of rhizoids.

B. Production of spores.

C. Alternation of generation.

D. Xerophytic life cycle.

45. One of the following is not a causative organism of human malaria.

A. *Plasmodium falciparum.*

B. *Plasmodium ovale.*

C. *Plasmodium vivax.*

D. *Plasmodium berghei.*

46. Choose the option that best describes the lag phase.

A. Lag phase is the period when the bacteria are adjusting to the environment.

B. Lag phase is the period when the environment is adjusting to the bacteria.

C. Lag phase is the period when the bacteria records the highest growth rate.

D. Lag phase is the period when the environment slows down the bacteria growth.

47. Identify the option which is not caused by a pathogen.

A. Malaria.

B. Cancer.

C. Measles.

D. Tuberculosis.

48. A pharmaceutical company involved in the production of penicillin would find one of these organisms useful.

A. Bacteria.

B. Protozoa.

C. Fungi.

D. Virus.

49. A person who consumes mouldy bread is most likely to consume one of the following organisms.

A. *Aspergillus sp.*

B. *Plorutus sp.*

C. *Mycelium sp.*

D. *Mouldellum sp.*

50. A piece of yam fell into a solution of unknown concentration. After 5 days, the piece of yam was found to be of the same size because the solution it fell into is …

A. hypotonic.

B. hypertonic.

C. isotonic.

D. hydrotonic.

SECTION B: BIOLOGY ESSAY QUESTIONS

Answer FOUR questions in all; ONE from each Course

BIO 001 GENERAL BIOLOGY

1 (a) State one (1) function of the following cell organelles:

i. Nucleus

ii. Plasma membrane

iii. Ribosome

iv. Chloroplast

v. Ribosomal Endoplasmic Reticulum

vi. Golgi apparatus

vii. Mitochondria

viii. Cell wall

ix. Lysosome

x. Vacuoles. **[5 marks]**

(b) Mention three (3) similarities between a prokaryotic and an eukaryotic cell. **[3 marks]**

(c) Mention two (2) differences between a prokaryotic and an eukaryotic cell. **[2 marks]**

2. A breed of dog is said to have genes for hair colour and leg length. Allele 'A' is dominant and gives brown hair. Allele 'a' is recessive and gives black hair. Allele 'L' is dominant and gives long legs, and allele 'l' is recessive and gives short legs.

(a) Present in tabular form, the various types of genotypes and phenotypes that the dogs may have. **[5 marks]**

(b) Construct a genetic table to show the offspring a breeder would expect between two dogs that are heterozygote for both genes using Punnet square. **[4 marks]**

(c) State the phenotypic ratio of the cross. **[1 mark]**

BIO 002 BOTANY

3 (a) What is conservation? **[2 marks]**

(b) Differentiate between *in-situ* and *ex-situ* conservation. **[2 marks]**

(c) Outline the merits and demerits of each of *in-situ* and *ex-situ* conservation. **[6 marks]**

4 (a) With the aid of a labelled diagram alone, show the general sexual life cycle of fungi. **[5 marks]**

(b) Outline the general characteristics of Basidiomycetes. **[5 marks]**

BIO 003 MICROBIOLOGY

5 (a) Name three (3) major constituents of plant tissues decomposed by fungi. **[3 marks]**

(b) Write two (2) importance of fungi to the soil. **[2 marks]**

(c) List five (5) general characteristics of fungi. **[5 marks]**

6 (a) In a tabular form, name six (6) microorganisms causing infectious diseases in animals, indicating the diseases caused and their common sources. **[6 marks]**

(b) Briefly describe yeast reproduction. **[4 marks]**

BIO 004 ZOOLOGY

7 (a) Define the term: tissue. **[1 mark]**

(b) State the four (4) main types of tissue found in animals. **[2 marks]**

(c) Write short notes on each of the various types of epithelial tissues, indicating their structures, locations and functions. **[7 marks]**

8 (a) Describe sexual reproduction in *Hydra*. **[6 marks]**

(b) Briefly describe nutrition in *Hydra*. **[4 marks]**