

Haramaya University
College of Agriculture and Environmental Sciences

School of Plant Sciences

Second round mock examination

Exam Date: 15/5/2023 Maximum weight of the exam: 100%
Exam Room: _____ Maximum allowed time: 1.5
minutes for each
Class year of the students: **PLSc IV**

General instructions:

- ❖ Please read each question carefully before attempt to answer
- ❖ The use of electronic devices such as iPods, cell phones, MP3 players, etc. is prohibited during the exam.
- ❖ The use of written materials not officially permitted into the exam hall in any form, such as on a piece of paper, on cloth, on body parts, etc., is prohibited.
- ❖ The exchanging of information in the exam hall through oral, symbolic, written, or electronic devices is prohibited unless specifically permitted.
- ❖ Any form of cheating or an attempt to cheat will nullify your work.
- ❖ Please make sure that you have received **26 pages**, including the cover page, and don't detach any of the exam pages.

❖ Name _____ ID. No _____ Signature _____

1. From the following lists, which one is the main objective of plant breeding?

- A. Yield
- B. Suitability for mechanization
- C. Quality
- D. All are correct

Answer, D

2. During crop improvement or breeding program, from which gene pool class we cannot transfer the gene from donor easily?

- A. Primary gene pool
- B. Secondary gene pool
- C. Tertiary gene pool
- D. Same for all source

Answer, C

3. From the following mechanisms which one promotes self-pollination?

- A. Self-incompatibility
- B. Unisexuality
- C. Cleistogamy
- D. Protogyny

Answer, C

4. The genetic gain or genetic advance under selection can be determined by_____.

- A. Heritability
- B. Number of selected individuals
- C. Genetic variability in original population
- D. All are correct

Answer, D

5. Suppose we have two varieties of wheat, one disease susceptible and high yield and, the other one is disease resistant and low yielding variety. To transfer the disease resistant gene to high yielding variety, which type of breeding method we use?
- A. Pedigree method
 - B. Bulk method
 - C. Backcrossing method
 - D. Hybridization

Answer, C

6. From the following things which one doesn't disturb the equilibrium of the cross-pollinating population
- A. Random mating
 - B. Selection
 - C. Inbreeding
 - D. All

Answer, A

7. The loss in vigor and productivity of clones with time is known as _____.
- A. Clonal degeneration
 - B. Clonal selection
 - C. Mutation
 - D. None

Answer, A

8. The change on the chromosome number because of mutation can be_____.

- A. Gene mutation
- B. Point mutation
- C. Chromosome mutation
- D. Genome mutation

Answer, D

9. All are the major goal of seed technology, except;
- A. Providing high quality of seed that meets the minimum standards set for the seed.
 - B. Rapid multiplication of seed
 - C. Providing quality seed at high price
 - D. Timely supply of seed to the user

Answer, C

10. All but one is not a characteristic of good quality seed
- A. It must be genetically pure (true to type)
 - B. It should be free from objectionable weed seeds
 - C. It should have high market value
 - D. It should not be free from other crop seeds

Answer, D

11. One of the following is not important during selecting seed production plot
- A. The plot should get adequate isolation distance
 - B. The plot should be free from volunteer plants weeds and other crop plants
 - C. The next planned crops should be the same with previous
 - D. The plot should have good texture and fertility

Answer, C

12. Sample is formed by combining and mixing all the primary samples taken from the seed lot is called:
- A. Primary sample

- B. Lot sample
- C. Submitted sample
- D. Composite sample

Answer, D

13. During seed germination, seed coat ruptures due to
- A. Massive glycolysis endosperm and cotyledons
 - B. Sudden increase in cell division
 - C. Differentiation of cotyledons
 - D. Massive imbibitions of water

Answer, D

14. A post-harvest treatment that improves germination or seedling growth or facilitates the delivery of seeds and other materials required at the time of sowing is known as_____.
- A. Vigour test
 - B. Seed quality enhancement
 - C. Varietal purity test
 - D. Germination test

Answer, B

15. Type of germination in which cotyledons are pulled above ground after elongation of hypocotyls is called
- A. Epicotyls germination
 - B. Hypocotyls germination
 - C. Epigeal germination
 - D. Hypogeal germination

Answer, C

16. During seed production number of field inspection is more in:
- A. Self-pollinated crops

- B. Cross pollinated crops
- C. Hybrids
- D. None of the above

Answer, C

17. Which one of the following alternatives is source of contaminations in plant tissue culture laboratory

- A. Nutrient medium
- B. Operator
- C. Explants
- D. All

Answer, D

18. Based on the area where this technology is in use, biotechnology can be classified into five different categories. Of these categories which field is focused on agricultural sector and used in crop improvement and production of novel products in plant.

- A. Blue Technology
- B. Red Technology
- C. Green Technology
- D. White Technology

Answer, C

19. Among the following statements one is incorrect about moist heat sterilization

- A. It used for sterilization of hormones
- B. Heating the materials at a temperature of 121°C and pressure of 15 psi for 15-20 minutes in an autoclave under steam, sterilize all the materials
- C. Autoclave machine is used for this sterilization procedures
- D. All

Answer, A

20. Which one statement is not correct regarding tissue culture medium
- A. Nutritional requirements for optimal growth of a tissue in vitro may vary according to the cell, tissues, and organ
 - B. Natural medium consists chemically defined chemical compound
 - C. Agar is used only for solidifying medium
 - D. White's medium was designed for root culture

Answer, B

21. Purity of DNA is measured by Absorbance at
- A. (a) A^{260}
 - B. A^{280}
 - C. A^{280} / A^{260}
 - D. A^{260} / A^{280}

Answer, D

22. Which of the following acts as a genetic material?
- A. DNA
 - B. RNA
 - C. Both
 - D. None

Answer, C

23. The Northern blotting technique is used for the detection of:
- A. DNA
 - B. RNA
 - C. Protein
 - D. None

Answer, B

24. SNPs marker are created by:
- A. Transitions
 - B. Transversions
 - C. Insertions and deletions
 - D. All

Answer, D

25. Which one of the following statements is true about plant cells?

- A. Cell membrane provides their shape.
- B. They lack plastids.
- C. Cells may burst if they insert into a hypotonic solution.
- D. Nucleus controls the overall activities of the cell.

Answer, C

26. ____ Pathway is the continuous flow of water through cell walls and intercellular air spaces.

- A. Apoplast
- B. Symplast
- C. Transmembrane
- D. All

Answer, A

27. What are the significances of photosynthesis in green plants?

- A. To produce food for all the living organisms directly or indirectly.
- B. To provide raw materials for building, or making other useful products.
- C. To keep environmental balance.
- D. All.

Answer, D

28. Which one of the following is not a C₄ plant?

- A. Sorghum
- B. Maize
- C. Sugarcane
- D. Cactus

Answer, D

29. Which respiration is carried out in the absence of oxygen?

- A. Glycolysis.
- B. Krebs cycle.

- C. Formation of acetyl CoA.
- D. Electron transport chain.

Answer, A

30. Growth is a progressive and irreversible process that involves
- A. Cell division
 - B. Cell enlargement
 - C. Cell Differentiation
 - D. All

Answer, D

31. Which one of the following plant hormone does regulate cell division?
- A. Auxin
 - B. Cytokinin
 - C. Gibberellin
 - D. Absciscic acid.

Answer, B

32. Which one of the following is a morphological adaptation mechanism of xerophyte plants?
- A. To develop thick cuticle.
 - B. To develop succulent leaves.
 - C. To develop white or spine leaves.
 - D. All.

Answer, D

33. The ideal way to synchronize essential nutrient supplies with the plant's nutrient requirements is_____.
- A. To supply limited plant nutrients when the plant is at the vegetative growth stage
 - B. To supply plant nutrients early only at the germination and seedling stage
 - C. To supply plant nutrients based on the growth stages of the plant
 - D. To supply plant nutrients only when the plant approaches physiological maturity

Answer, C

34. Which of the following defines the condition when the concentration of an essential element is low enough to severely limit crop yield and cause clearly visible deficiency symptoms?

- A. Nutrient sufficiency
- B. Nutrient deficiency
- C. Nutrient toxicity
- D. Nutrient critical range

Answer, B

35. Why soil colloids are so important for the fertility of the soil and plants growth?

- A. They hold a little supply of base cations essential for plant growth.
- B. They facilitate removal and leaching out of the nutrients from the soils.
- C. They have a high base status which holds an abundant supply of nutrient cations.
- D. Their surfaces decrease the attraction of soil nutrients dissolved in soil water.

Answer, C

36. One of the following is recognized as ideal for making the soil fertile?

- A. Overabundance of acidic materials in the soil
- B. The right mix of minerals and inorganic matter
- C. The right mix of minerals and organic matter
- D. High levels of salt in the soil

Answer, C

37. is the nutritional status of plants associated with the extreme excessive supply and poor nutrient management.

- A. Acute toxicity
- B. Luxury supply
- C. Marginal toxicity
- D. Acute deficiency

Answer,C

38. Which of the following is/are correct about soil fertility evaluation?

- A. It is the most basic decision-making tool for efficient nutrient management.
- B. It is a diagnosis of the nutrient status of the soil by using different techniques.
- C. It aims to quantify the ability of soils to supply nutrients for plant growth.
- D. All are the correct answer.

Answer, D

39. What information can be generated from the numerical value of the soil test?

- A. The actual removal of nutrients from the soil and content of nutrients in the plant
- B. The hidden hunger and visual symptoms of plants
- C. The deficiency of nutrient elements and related metabolic disruptions in plants
- D. The amounts of nutrients needed to attain better crop growth or yield in soils

Answer, D

40. Why are essential plant elements such as Fe, Zn, Cu, B, Mo and Cl called micronutrients?

- A. They all very small elements.
- B. They all are minimally important to the growth and reproduction of plants.
- C. They all are taken up in very small amounts by plants.
- D. They all are rare in the soil.

Answer, C

41. Which one of the following is not a feature of a subsistence production system?

- A. Small and fragmented land
- B. Primitive tools and implements
- C. Mechanization
- D. Production geared to personal needs rather than to market

Answer, C

42. Which of the following is not used in the conservation of crop plants?

- A. Seed bank
- B. Gene bank
- C. Zoo
- D. Tissue culture

Answer, C

43. Among the following one is not the modern concept of tillage.

- A. Minimal cultivation for the conservation of soil and water
- B. Proper timing of tillage operations
- C. Proper choice of implements and reducing negative impacts on the soil
- D. Complete removal of crop residues from the surface of the soil

Answer, D

44. Among the following environmental factors, one is not a universal requirement for the germination of field crop seeds.

- A. Temperature
- B. Air
- C. Light
- D. Moisture

Answer, C

45. Which cultural operation is not practiced after the crop emergence?

- A. Thinning
- B. Gap filling
- C. Rogueing
- D. None of the above

Answer, D

46. The advantages of inorganic fertilizers as compared to organic fertilizers are:-
- A.They are not bulky and act fast
 - B.They are easily transported
 - C.They are much reliable when it comes to the nutrient concentration
 - D.All of the above

Answer, D

47. _____ pods complete their development underground.
- A.Common bean
 - B.Peanut
 - C.Soybean
 - D.Field pea

Answer, B

48. Which of the following is not the preventive method of weed control?
- A. Proper cleaning of farm machinery
 - B. Hand weeding and post emergence herbicide application
 - C. Following legal and quarantine measures
 - D. Using weed free crop seed

Answer, B

49. The value of pressure potential at the water table is
- A. Zero
 - B. Negative
 - C. Positive
 - D. Cannot be determined

Answer, A

50. Which one of the following crops is more tolerant to salinity?
- A. Orange

- B. Cabbage
- C. Wheat
- D. Cotton

Answer, D

51. Electrical conductivity measurement of water reveals its contents of

- A. Total dissolved salts
- B. Total inorganic ions
- C. Total electrolytes
- D. All of these

Answer, D

52. In saturated condition the flow of water among the following soils is maximum in

- A. Loamy sand
- B. Sandy loam
- C. Clay loam
- D. Sandy clay

Answer, B

53. Poor quality irrigation water is

- A. More injurious to soil properties
- B. More injurious to plant growth
- C. Equally injurious to both soil properties and plant growth
- D. Not at all injurious to either plant growth or soil properties

Answer, C

54. In an unsaturated condition the flow of water among the following soils is maximum in

- A. Sandy loam
- B. Clay Loam
- C. Silty loam
- D. Silty clay

Answer, B

55. As the water content of a soil increases, soil moisture tension

- A. Increases
- B. Decreases
- C. Remains unchanged
- D. None of the above

Answer, B

56. Subsurface irrigation helps to

- A. Avoid surface runoff

- B. Reduce evaporation loss of water to a minimum
- C. Decrease deep percolation loss by increasing infiltration
- D. A and B

Answer, D

57. One of the following is NOT the function of the insect head.
- A. It is segmented.
 - B. Bears the major locomotion appendages.
 - C. Bears sensory organs like antennae, compound eyes, and ocelli.
 - D. Bears the organs of feeding, tasting, and smelling, and can be used to defend the enemy.

Answer, D

58. One of the following is NOT the antennal segment of an insect.
- A. Flagellum
 - B. Pedicel
 - C. Scape
 - D. Aristate

Answer, D

59. Which one of the following is true about the apposition types of insect compound eyes?
- A. It forms a mosaic image.
 - B. It is found in nocturnal insects.
 - C. It forms a real and erect image.
 - D. It is highly sensitive to light, unlike the superposition eye.

Answer, A

60. The stoutest and longest leg segments of cockroaches are _____ and _____.
- A. Coxa and pretarsus
 - B. Femur and tibia
 - C. Trochanter and tibia
 - D. Tarsus and pretarsus

Answer, B

61. A pair of secretory structures located dorsally on the abdomen of aphids that produce substances that repel predators or elicit care-giving behavior by symbiotic ants is known as

- A. Collophore
- B. Pincers
- C. Cornicles
- D. Abdominal gills

Answer, C

62. Which part of the insect gut is responsible for the majority of digestion and absorption of insect food?

- A. Proctodeum
- B. Mesenteron
- C. Stomodeum,
- D. Rectum

Answer, B

63. The Malpighian tubules and the rectum are

- A. Found in the posterior regions of insects,
- B. Regulating water loss during excretion of metabolic waste
- C. The rectum squeezes out undigested food and uric acid crystals through the anus.
- D. All the answers are correct.

Answer, D

64. Which allelochemical is used by the receiver as opposed to the producers?

- A. Allomones
- B. Kairomone
- C. Synomones
- D. Synonymous

Answer, B

65. The production of toxic substances by plants, which have adverse influence on other plants known as:

- A. Strigolactone
- B. Allelopathy
- C. Haustorium
- D. Cytokinins

Answer, B

66. Which of the following is an example of a broadleaf weed?
- A. *Cynodon dactylon*
 - B. *Phalaris minor*
 - C. *Datura stramonium*.
 - D. *Lolium temulentum*

Answer, C

67. Competition between weeds and crops is high when:
- A. Sufficient moisture available
 - B. Common resource is limited
 - C. Soil fertility is improved
 - D. All

Answer, B

68. Successful weed management is based on:
- A. Assessment of the nature of weeds
 - B. Awareness on weed biology and ecology.
 - C. Removal of weeds before flowering
 - D. All

Answer, D

69. The maximum crop-weed competition occurs at what time?
- A. Economic threshold
 - B. Critical period
 - C. Dormancy
 - D. Late weed growth

Answer, B

70. The benefit of using integrated weed management is:
- A. It shifts the crop-weed competition in favour of crop
 - B. Prevents weed shift towards perennial nature
 - C. Prevents resistance in weeds to herbicides
 - D. All

Answer, D

71. Herbicide drift occur in which of the following condition
- A. High wind
 - B. Dry
 - C. Warm
 - D. Humid

Answer, A

72. One of the following is non-selective herbicide?
- A. 2, 4-D
 - B. Glyphosate
 - C. Atrazine
 - D. Trifluralin

Answer, B

73. All fungi are
- A. Autotrophs
 - B. Heterotrophs
 - C. Saprophytes
 - D. Parasites

Answer, B

74. The mushroom is
- A. A plant made up of fine green threads
 - B. An edible fungus
 - C. A bryophyte without roots
 - D. A flowering plant

Answer, B

75. Disease diagnose is very important for developing effective strategies for
- A. Crop management
 - B. Field management
 - C. Soil management
 - D. Disease management

Answer, D

76. Epidemiology deals with

- A. Spread of disease
- B. Influence of environmental factors
- C. Environment and pathogen compatibility
- D. Dissemination of disease

Answer, C

77. Period between penetration by inoculum and appearance of disease is called:

- A. Inoculation period
- B. Incubation period
- C. Acquisition period
- D. None of these

Answer, B

78. The ability of the plants to sustain the effect of injury with no or little effect on yield

- A. Resistant
- B. Tolerance
- C. Economic threshold level
- D. Resistance

Answer, B

79. Alternate host is that host which bears the pathogen

- A. In the major host crop
- B. In the absence of major host crop
- C. Host of more than two types of pathogen
- D. Collateral host

Answer, B

80. Nematodes possess all the physiological systems like animals except

- A. Digestive
- B. Circulatory
- C. Nervous system
- D. Both B and C

Answer, B

81. Which one is non-climacteric fruit?

- A. Banana
- B. Mango
- C. Sweet Orange
- D. Apple

Answer, C

82. What is the term used to describe cuttings taken from mother plants?

- A. Babies
- B. Clones
- C. Phenotypes
- D. New young branch

Answer, B

83. Which types of budding can be done when bark is not slipping”?

- A. T budding
- B. Inverted T budding
- C. Patch budding
- D. Chip budding

Answer, D

84. Which one of the following is physical measurement of maturity indices?

- A. Titrable Acidity
- B. TSS/Acid ratio
- C. Starch content
- D. Flesh firmness

Answer, D

85. The most economical method of irrigation under water scarcity is

- A. Surface/ furrow irrigation
- B. Sprinkler irrigation
- C. Drip irrigation
- D. None

Answer, C

86. Which one is not inhibitor of Ethylene biosynthesis?

- A. CO₂
- B. Ethrel
- C. Ag(S₂O₃)₂
- D. Etyl block (1-Methyl cyclopropene)

Answer, A

87. Which one is/are not common/traditional storage of fresh fruits and Vegetables?

- A. Storage in cave
- B. Storage in mounds
- C. Storage in trenches
- D. Cold storage

Answer, D

88. According to Botanical classification (on the basis of the number of ovaries and flowers involved in the fruit formation) which one of the following is a simple fruit?

- A. Mango
- B. Pineapple
- C. Black Berry
- D. Rasp berry

Answer, A

89. Which classification method of vegetables has much practical value for farmers when basic idea of classification is taken into consideration?

- A. Botanical classification
- B. Thermo classification
- C. Classification based on method of cultural requirement
- D. Classification based on nutritive value

Answer C

90. One of the following is/ are **false** about tuber formation/tuberization/ of potato?

- A. Short day and low nitrogen level enhance tuberization

- B. Long days prolong the vegetative growth phase at the expense of tuber formation
- C. High temperature is not conducive to good tuber formation
- D. Long day and high N level increase the tuber number

Answer, D

91. Which one of the following is **not** the main feature of horticultural sciences?

- A. Aesthetic sense of gratification
- B. Rich source of vitamins and minerals
- C. Skilled operations involved in propagation, fertilization, training, pruning, harvesting and marketing.
- D. Extensive cultivation required

Answer, D

92. Which one is false about truck gardening system of vegetable growing?

- A. Middle men involvement
- B. Extensive type of gardening
- C. Intensive type of gardening
- D. Large acreage enterprise

Answer, C

93. To achieve maximum benefit from fertilizers, it is most essential to apply them at the right time and in the right place. Which of the following factors determine the amount and timing of nutrient uptake?

- A. Crop variety
- B. Planting date
- C. crop rotation
- D. All

Answer, D

94. _____ is one of the methods of managing extremely sloping land for Vegetable crop production.

- A. Bed making
- B. Terracing
- C. Inter tillage
- D. None

Answer, B

95. _____ is the artificial application of water to the soil for the purpose of supplying the moisture essential for plant growth.

- A. Mulching
- B. Fertigation
- C. Irrigation
- D. None

Answer, C

96. Among the following vegetable crops, one is not usually started in well prepared seed beds

- A. Tomato
- B. Cabbage
- C. Cucumber
- D. all

Answer, C

97. The general objective/purpose of a research is

- A. To gain familiarity with a phenomenon
- B. To portray accurately the characteristics of an individual
- C. To determine the frequency with which something occurs
- D. All

Answer, D

98. All of them are the characteristics of a research except
- A. Is directed toward the solution of a problem
 - B. It requires expertise
 - C. It is based upon observable experience or empirical experiences
 - D. It is not characterized by a carefully designed procedure

Answer, D

99. Quantitative research includes all of the following except
- A. It is a research that describes phenomenon in words
 - B. The concepts of the theory are translated into variables
 - C. Its data can be summarized and analyzed
 - D. The variables are measured by some known methods

Answer, A

100. The cover page of a scientific research paper includes
- A. Title
 - B. Type of document
 - C. Abstract
 - D. A and B

Answer, D

101. Of the following, one is against the basic principles for on-farm research
- A. Keep it real
 - B. Go step by step
 - C. Keep it simple
 - D. None of the above

Answer, D

102. One of the following is not true about Introduction in scientific research paper writing.

- A. Is a brief section that provides sufficient context and background?
- B. Usually follow a funnel style, starting broadly and then narrowing
- C. Focuses on the overall issue, problem, or question that your research addresses.
- D. None of the above

Answer, D

103. A type of research designed to adjust new technology to a specific set of environmental conditions is known as

- A. Adaptation research
- B. Strategic research
- C. Basic research
- D. All

Answer, A

104. The possible motives for doing a research may be either one or more of the following:

- A. Desire to get a research degree along with its consequential benefits;
- B. Desire to face the challenge of solving the unsolved problems
- C. Desire to get the intellectual joy of doing some creative work;
- D. All of the above

Answer, D

105. The main purpose of doing research in to a specified subject/area is _____

- A. to confirm the results of previous finding
- B. to discover new facts/principles
- C. to reject the results of previous finding
- D. All

Answer, D

106. _____ is the treatments mean comparison in which the specific pair of treatments to be compared is identified before the start of the experiment.

- A. Control
- B. Planned pair comparison
- C. Unplanned pair comparison
- D. None

Answer, B

107. What is the variation in the responses among experimental units which are assigned the same treatment, and are observed under the *same* experimental conditions?

- A. Design
- B. Experimental error
- C. Control
- D. Variable

Answer, B

108. The underlying principle to use Split-Plot Design is that;

- A. the levels of one factor are assigned at random to large experimental units
- B. the levels of second factor are assigned at random to small units within divided large units

C. each main plot becomes a block for the sub-plot treatments

D. All are correct

Answer, D

Questions 109-110 will be attempted based on the following;

Mr. Chala wants to study the effects of sowing methods (S_0 = broadcasting, S_1 = row planting) and nitrogen fertilizer in the form of UREA (N_0 = 0 kg/ha, N_1 = 50 kg/ha, N_2 = 100 kg/ha, and N_3 = 150 kg/ha) on the yield performance of sorghum using Split Plot Design with 3 replications. If he wants to estimate the effect of nitrogen at a greater precision than sowing method,

109. Which factor/treatment should be assigned to main plot?

A. Nitrogen Fertilizer

B. Sowing Method

C. Sorghum Variety

D. Sowing Method-Fertilizer interaction

Answer, B

110. What is the total number of experimental units required for this experiment?

A. 6

B. 8

C. 9

D. 24

Answer, D

Questions 111-112 will be attempted based on the following;

Assume Mr. Desalegn has evaluated six (6) common bean varieties for yield performance under RCBD with four replications and scored following data.

Source of variation	Df	SS	MS	Computed F	Tabular- F	
					5%	1%

Block		3.14			3.29	5.42
Treatment		31.65			2.90	4.56
Error		19.72				
Total	23	54.51				

111. What are the Treatment mean square and error mean square, respectively?

- A. 6.33 ; 1.31
- B. 31.65 ; 19.72
- C. 10.08 ; 6.28
- D. 1.38 ; 0.86

Answer, A

112. Which of the following is true based on the above data?

- A. There is highly significant difference among the common bean varieties for yield.
- B. There is significant difference among the common bean varieties for yield.
- C. There is non-significant difference among the common bean varieties for yield.
- D. There is highly significant difference due to blocking effect.

Answer, A