



OROMIA EDUCATION BUREAU

**GRADE 11 BIOLOGY FINAL EXAM FOR BOARDING AND NON-BOARDING (SPECIAL)
SCHOOLS, JANUARY 2016/2024.**

TIME ALLOWED: 1:15'

GENERAL DIRECTIONS

THIS BOOKLET CONTAINS **BIOLOGY** FINAL EXAM FOR **GRADE 11**. IN THIS EXAM THERE ARE TOTAL OF **60** MULTIPLE CHOICES QUESTIONS.

THERE IS ONLY ONE BEST ANSWER FOR EACH QUESTION. CHOOSE THE BEST ANSWER FROM THE SUGGESTED OPTIONS AND WRITE THE LETTER OF YOUR CHOICE ON THE ANSWER SHEET PROVIDED.

YOU WILL BE ALLOWED TO WORK ON THE EXAM FOR **75 MINUTES**. WHEN TIME IS CALLED, YOU MUST IMMEDIATELY STOP WORKING, PUT YOUR PEN/PENCIL DOWN, AND WAIT FOR FURTHER INSTRUCTIONS.

ANY FORM OF CHEATING OR AN ATTEMPT TO CHEAT IN THE EXAM WILL RESULT IN AN AUTOMATIC DISMISSAL FROM THE EXAM HALL AND CANCELLATION OF YOUR SCORE.

PLEASE MAKE SURE THAT YOU HAVE WRITTEN ALL THE REQUIRED INFORMATION ON THE ANSWER SHEET BEFORE YOU START TO WORK ON THE EXAM.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

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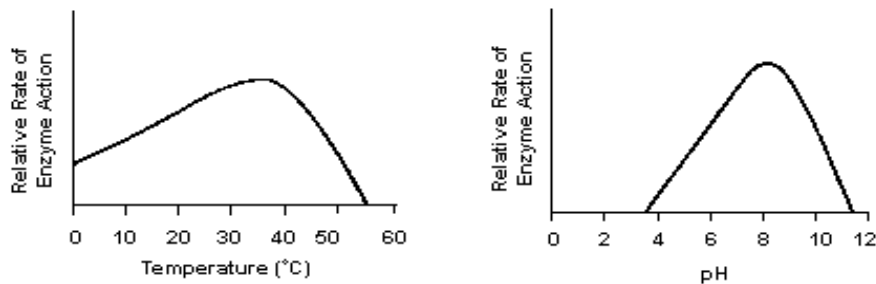
1. There are significant difference between meiosis I and meiosis II. Because during meiosis II:
 - A. There is crossing over in prophase
 - B. There is separation of sister chromatids
 - C. There is separation of homologous pair of chromosome
 - D. Chromosomes line up side by side
2. Honeybees can be 'trained' to collect sugar water from coloured dishes on a feeding table. If a blue dish with pure water sits next to a yellow dish with sugar water, worker bees will quickly learn to associate 'yellow' with food (even if the dishes are moved around). This is an example of
 - A. Operant conditioning
 - B. Classical conditioning
 - C. Latent learning
 - D. Insight learning
3. Which of the following is the characteristic of an enzyme?
 - A. They raise the amount of energy present in enzyme substrate complex.
 - B. They react with substrate and gradually used up during the processes
 - C. Enzyme lower the amount of energy present in the substrate
 - D. Enzyme lower the activation energy present in an enzyme substrate complex
4. House building is an imitation of _____
 - A. Termite's mound
 - B. Wing of bats
 - C. Wing of birds
 - D. Mosquito proboscis
5. When a nipple is placed in a newborn baby's mouth, the infant will immediately begin to suckle. This is an example of
 - A. Imitation.
 - B. Innate behavior
 - C. Imprinting
 - D. Classical conditioning.
6. Which one of the following is ethical way of treating plants?
 - A. Deforestation
 - B. Testing seeds by destructive rays
 - C. Consumption of seeds and fruits with conservation
 - D. Burning of forests for farmland
7. Suppose 75% of the molecules of an enzyme are inhibited by noncompetitive inhibitors. Which of the following would happen if the amount of substrate is increased by 50%?
 - A. The rate of the reaction would increase by 50%.
 - B. The reaction rate would double.
 - C. The rate of the reaction would remain unchanged
 - D. The rate of the reaction would increase by 75%.
8. Which of the following events occurs during prophase I of meiosis I?
 - A. Duplication of chromatids
 - B. Separation of homologous chromatids
 - C. Formation of nuclear envelope & Dispersion of spindle fibers
 - D. Exchanging of genetic material between non sister chromatids

9. Which is not all about the use of biology in a more modern way?
 - A. Breathing in O₂ coming from photosynthesis
 - B. Production of biofuels
 - C. Production of biological weapons
 - D. Creating antibiotics
10. Which of the following is **not** true about the lock-&-key and induced fit model?
 - A. Lock-&-key model visualize weakening of substrate bond, whereas induced fit model **not**.
 - B. Lock -&-key model **doesn't** explain development of transition state, while the induced fit model **does**.
 - C. In both cases active site of an enzyme is bind to the substrate.
 - D. Both express the mechanism of competitive inhibitor
11. Biochemical test can be applied to the following except_____
 - A. Nucleic acid quantification
 - B. Protein test
 - C. Determination blood sugar content
 - D. Physiotherapy
12. A process in which an individual develops from unfertilized eggs is_____
 - A. Metamorphosis
 - B. Complete metamorphosis
 - C. Hatching
 - D. Parthenogenesis
13. All of the followings are non Mendelian inheritance EXCEPT
 - A. Multiple allelism
 - B. Codominance
 - C. Complete dominance
 - D. Incomplete dominance
14. Which of the following factor does not result in high blood glucose level?
 - A. Production of low level of insulin
 - B. Loss of response to insulin in target cells
 - C. Having regular physical exercise
 - D. Over consumption of carbohydrate rich food
15. Which one happens earlier?
 - A. Blastula
 - B. Eight-celled structure
 - C. Gastrula
 - D. Tissue and organs
16. Which of the following statement is concerning Osmoregulation in Human body is not true
 - A. High amount of ADH is released when the water content of blood is too low
 - B. Less amount of ADH is released when the water content of blood is too high
 - C. Secretion of ADH in different amount can influence the water content of urine
 - D. If less amount ADH is secreted the kidneys reabsorb high concentration of water
17. Which of the following example is not inherent behavior?
 - A. Swimming with dolphins and other aquatic species.
 - B. Opening of mouth in chicks of many bird species when their mother returns to the nest.
 - C. Honeybees dance when they return to the hive after finding a source of food
 - D. Salivation of a dog when a bell was rung in the absence of food ,which was paired with the conditioned stimulus
18. Which of the following statement does not characterize learned behavior?
 - A. It is genetically determined and fully functional at the first attempt
 - B. It is changed by, or develops through, experience and may vary from individual to individual
 - C. The animal develops the behavior through trial and error or by insight.
 - D. The behavior may be modified by new experiences

19. Why sweating is referred to be best mechanism of cooling down?
- It raises the temperature of the body
 - It is a means by which heat is released
 - It is a means by which sweat glands are arrested
 - It is a means by which the body is hydrated
20. Why small animals eat more when compared to their body size?
- Because they loss much heat compared to their body size
 - Because their body weight is small
 - Because their skin is more porous as compared to other animals
 - Their skin is covered by thick fat layer
21. Identify the rightly matched cause and effect.
- Increased body temperature- vasodilatation
 - Sweating-increase in temperature
 - Increased insulin-shot in blood sugar
 - Vasoconstriction- cooling
22. Mammals living in the tropics as compared to similar species living in the Polar Regions have generally large protruding structures. Why?
- To minimize water loss
 - To maximize heat loss
 - To regulate salt loss
 - To gain weight
23. To which of the following does a zoologist has minimum concern?
- Geographical distribution of animals
 - Study of animals along the course of evolution
 - Genetic manipulation of animals
 - Animal behavior
24. According to the induced fit hypothesis of enzyme catalysis, which of the following is *correct*?
- The binding of the substrate depends on the shape of the active site.
 - Some enzymes change their structure when activators bind to the enzyme.
 - A competitive inhibitor outcompete the substrate for the active site.
 - The binding of the substrate changes the shape of the enzyme's active site.
25. Which one of the following is an example of territorial behavior of animals?
- Fixed action of zebra fish to find a mate
 - Honeybees nesting in a tree
 - A male robin threatening an intruder
 - Penguins huddling to reduce heat loss
26. Which of the following thermoregulatory mechanisms in homoeothermic animals is categorized into behavioral method?
- Go into mud when the temperature rises
 - Dilation of capillaries under the skin when the temperature increases
 - Shivering as a result of drop in temperature
 - Sweating when the temperature rises
27. All of the followings are examples of osmoconformers EXCEPT
- Lobster
 - Human
 - Starfish
 - Jelly fish

28. Which of the following physiological thermoregulatory mechanism is **not** normally associated with cold weather?

- A. Contraction erector muscles underskin result in erection of hair
- B. Increasing contraction and relaxation of muscles which causes shivering
- C. Widening of capillaries under the skin which facilitates heat loss
- D. Increasing rate in metabolism to generate heat



29. Which statement best describes the enzyme represented in the graphs?

- A. This enzyme works best at a temperature of 35°C and a pH of 8.
- B. This enzyme works best at a temperature of 50°C and a pH of 12.
- C. Temperature and pH have no effect on the action of this enzyme.
- D. This enzyme works best at a temperature above 50°C and a pH above 12.

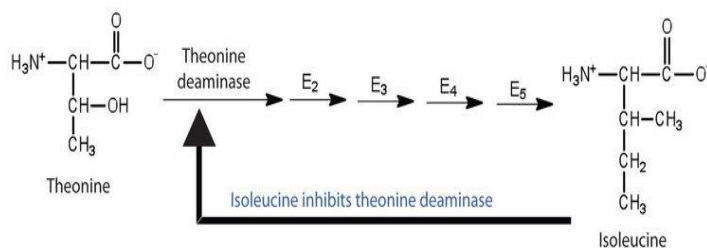
30. A double-stranded DNA molecule contains a total of 120 purines and 120 pyrimidines. This DNA molecule could be composed of

- A. 120 thymine and 120 adenine molecules.
- B. 120 cytosine and 120 thymine molecules.
- C. 240 adenine and 240 cytosine molecules.
- D. 240 guanine and 240 thymine molecules.

31. Which of the following statement about double-stranded DNA is false?

- A. The backbone contains Deoxy ribose sugars and phosphate groups.
- B. The strands are formed by nucleotides linked together via phosphodiester linkage
- C. The two strands have an antiparallel orientation
- D. The bases are on the outside of the helix and connect the two strands together

32. Which of the following is true of the figure given below? It shows



- A. End product inhibition.
- B. Irreversible inhibition
- C. Enzyme Denaturation.
- D. competitive inhibition

33. Why do the hairs on our skin sometimes stand up when we are cold?

- A. To know when we are frightened
- B. To trap air under them in order to keep us warmer
- C. To release air order to cool us down
- D. To trap air under them to keep us cooler

34. Some bacteria are metabolically active in hot springs because
- They are able to maintain a cooler internal temperature.
 - High temperatures make catalysis unnecessary.
 - Their enzymes have high optimal temperatures.
 - their enzymes are completely insensitive to temperature
35. Increasing the substrate concentration in an enzymatic reaction could overcome which of the following?
- Denaturization of the enzyme
 - Allosteric inhibition
 - Competitive inhibition
 - Saturation of the enzyme activity
36. Which one of the following is true of allosteric inhibition?
- Enzymes are activated when activator attached on the active site.
 - Inhibition by uncompetitive inhibitor when it affect enzyme action
 - Inhibition by competitive inhibitors when it interacts on the allosteric site
 - It occurred when inhibitors attached on the active site
37. Consider the following chemical reactions below.
- I. $X + H_2O \rightarrow X + Y$ II. $AP_4^- + B \rightarrow A + BP_4$
- The enzymes catalyze the reactions I, II represent respectively
- Lyases and Hydrolases
 - Ligases and Transferases
 - Transferases and Hydrolases
 - Hydrolases and Transferases
38. Which statement is **incorrect** about the factors that influence the rate of enzymatic action?
- When sufficient substrate is available the active site almost always occupied.
 - An enzymes activity is generally reduced by an increase in substrate concentration.
 - A change in an extreme PH causes an enzyme to be inactivated.
 - As temperature increases so the rates of an enzyme activity up to optimum point
39. Zinc, an essential trace element for most organisms, is present in the active site of the enzyme carboxypeptidase. The zinc most likely functions as a
- Cofactor necessary for enzyme activity.
 - Coenzyme derived from a vitamin.
 - Competitive inhibitor of the enzyme.
 - Allosteric activator of the enzyme
40. Six test-tubes were set up at different temperatures. Each contained identical solutions containing starch and amylase mixtures. The table shows the time taken for the reactions to finish in each test-tube. At which temperature does the amylase work best?

Temperature /°C	20	25	30	35	40	45
Time /seconds	50	30	15	5	20	60

A. 35

B. 40

C. 45

D. 20

41. Which type of interaction stabilizes the alpha (α) helix and the beta (β) pleated sheet structures of proteins?
- Hydrophobic interactions
 - Peptide bonds
 - Ionic bonds
 - Hydrogen bonds
42. The bases in the template strand of DNA are 5' AGGCTAGGC 3'. The corresponding codon for the mRNA transcribed is
- 3' UCCGAUCCG 5'.
 - 5'UCCGAUCCG 3'
 - 5'UGCGAUCCG 3'
 - 3' UCCGAUCCC 5'.

43. Which of the following stages of cell cycle correctly matched with events involved?
- G1 Phase - the cell replenishes its energy stores that exhausted & cytoskeleton disintegrates
 - G0 phase - the cell accumulates the building blocks of chromosomal DNA, the associated proteins and energy to complete the task
 - G2 Phase- the cell is neither dividing nor preparing to divide but performs regulatory and basic cellular functions
 - M phase - DNA replication proceeds to form identical pairs of DNA molecules that are firmly attached to the centromeric region.
44. A cell having 32 chromosomes ($2n$) undergoes meiotic cell division. then it results in
- 2 daughter cells each with 32 chromosomes
 - 4 daughter cells each with 16 chromosomes
 - 4 daughter cells each with 32 chromosomes
 - 2 daughter cells each with 16 chromosomes
45. Which of the following is the role topoisomerase enzyme in DNA replication?
- It binds to the double stranded DNA and stimulates the separation of the two strands.
 - It adds new nucleotides to a growing strand of DNA, and links together
 - links two fragments of DNA by forming a phosphodiester bond
 - It prevents super coiling at the region ahead of the replication fork.
46. Which of the following best describes semi conservative replication of DNA?
- The replication of DNA never takes place with 100% accuracy
 - The translation of a DNA molecule into a complementary strand of RNA.
 - A DNA molecule consists of one parental strand and one new strand.
 - The number of DNA molecules is doubled with every other replication.
47. Which of the following type of enzyme is incorrectly matched regarding its application in industry?
- | | |
|---------------------------------|--------------------------------------|
| A. Cellulose – Biofuel industry | C. Betagucanase –brewing industry |
| B. Rennin – dairy industry | D. Trypsin –molecular biology |
48. Mendel accounted for the observation that traits which had disappeared in the F_1 generation & reappeared in the F_2 generation by proposing that:
- The mechanism controlling the appearance of traits was different between the F_1 and the F_2 plants.
 - Traits can be dominant or recessive and the recessive traits were obscured by the dominant ones in the F_1 .
 - The traits were lost in the F_1 due to blending of the parental traits.
 - members of the F_1 generation had only one allele for each character, but members of the F_2 generation two alleles for each character
49. Which of the following alternative contains the correct sequence of the three meiotic events?
- Pair of homologous chromosomes, separation of homologous chromosome and separation of sister chromatids.
 - Separation of homologous chromosomes, Pair of homologous chromosome and separation of sister chromatids
 - Separation of sister chromatids Pair of homologous chromosomes and separation of homologous chromosome
 - Pair of homologous chromosomes, separation of sister chromatids and separation of homologous chromosome

- 8

57. How does crossing over during meiosis bring variation in species?

- A. Creating genes that are not found in both parents due to meiosis
- B. Increasing the number of genes in one of the parents during meiosis
- C. Combining of genes in gamete that are not found in either parent
- D. Combining the segment of DNA on sex chromosome and autosome

58. Which of the following is correct sequence of modern malting?

- A. Steeping, heating ,germinating
- B. Steeping, ,germinating, Heating
- C. Heating ,Steeping, germinating
- D. Germinating, steeping, heating

59. Which of the following genotypic ratio is **not** expected in the offspring if two tall pea plants are Mated? When tall is dominant over short

- A. 100%TT
- B. 50%TT, 50% tt
- C. 50%Tt, 50%TT
- D. 25%TT,50%Tt, 25%tt

60. Some events that take place during the synthesis of a specific protein are listed below.

- I. Messenger RNA attaches to a ribosome.
- II. DNA serves as a template for mRNA production.
- III. Transfer RNA bonds to a specific codon.
- IV. Amino acids are bonded together.
- V. Messenger RNA moves from the nucleus to the cytoplasm.

The correct order of these events is

- A. II, V, I, III & IV
- B. II, V, III, I & IV
- C. V, II, I, III & IV
- D. II, V, I, IV & III