KATHMANDU UNIVERSITY
End Semester Examination [C]
May/June, 2019

Marks Scored:

Level: B.Sc./B.Pharm./B.Tech.
Year : I

Course : BIOL 101
Semester : I

Exam Roll. No.

Time: 30 mins

F.M : 20

Registration .No.

Date : 06 JUN 2019

SECTION "A"
[10Q. × 1 = 10 marks]

Choose and tick [✓] the most appropriate answer.

1. Which of the following has the least permeability through plasma membrane?
[ ] Glucose [ ] Glycerol [ ] Water [ ] Oxygen

2. Light reaction of photosynthesis produces
[ ] NADH [ ] NADPH [ ] Glucose [ ] CO_2

3. Which of the epithelial tissue is present in the surface lining of stomach & intestines?
[ ] Simple Squamous Epithelium [ ] Cuboidal Epithelium
[ ] Columnar Epithelium [ ] Stratified Epithelium

4. Epidermis is developed from
[ ] periblem [ ] plerome [ ] dermatogen [ ] hypophysis

5. Mutation in the β-globin gene that causes sickle shaped anemia changes Glutamic acid into
[ ] Methionine [ ] Valine [ ] Tyrosine [ ] Glycine

6. In a trihybrid cross of Dd Gg Ww X Dd Gg Ww; for plant height, seed color and seed texture, what is the probability of a plant with the phenotype of being dwarf, yellow & wrinkled?
[ ] 27/64 [ ] 9/64 [ ] 3/64 [ ] 1/64

7. Migratory bird species are arriving on their breeding grounds in the northeastern United States on average of 13 days earlier than in previous decade; this biological effect of climate change is due to
[ ] geographic range shifts [ ] oceanic Acidification
[ ] evolutionary adaptation [ ] phenology shifts

8. Stuart's medium that uses reducing agent to prevent oxidation is an example of
[ ] simple media [ ] selective media
[ ] differential media [ ] transport media

9. The field of biotechnology that deals with cleaning up hazardous substance into nontoxic compounds is
[ ] medical biotechnology [ ] agricultural biotechnology
[ ] industrial biotechnology [ ] environmental biotechnology

10. ..... joins two DNA strands together by formation of phosphodiester bond.
[ ] ligase [ ] kinase [ ] endonuclease [ ] polymerase

SECTION "B"

[10Q. × 1 = 10 marks]

Fill in the blank(s).

11. Successful replication of chromosome is monitored at _____ of cell cycle.

12. Hydrogen ions are pumped into mitochondrial intermembrane space when electrons move through three complexes present in inner mitochondrial membrane, but not by _____.

13. Aerating pores on the bark in plants are called as _____.

14. _____ is the hemisphere of the animal egg where yolk is most concentrated.

15. A couple heterozygous for a recessive allele (Cc X Cc) bears 4 children; the probability of all four unaffected and none affected children is _____; if the disease is caused only in recessive homozygous state.

16. If two alleles appear to contribute independently to the phenotype of the heterozygotes, the phenomenon is called as _____.

17. _____ is the portion of the fundamental niche that a species actually occupies, given limiting factors such as competition with other species.

18. The bacteria that does not use oxygen but oxygen does not harm them are called as _____ bacteria.

19. High concentration of Auxin in the tissue culture media develops _____.

20. The capacity of mature cells to return to meristematic condition and develop into a new growing plant is called _____.

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Time: 2 hrs. 30 mins.

Course : BIOL 101
Semester: I
F.M. : 55

SECTION "C"

(Long answer questions)
[3Q. × 7 = 21 marks]

Attempt *ANY THREE* questions.

1. Describe Calvin Cycle with an illustrated diagram. Explain the reason behind photorespiration and the way CAM plants have evolved to minimize photorespiration.

2. Explain the example that illustrates linkage with observed ratio of two independently assorting gene not 9:3:3:1 in F_2 generation. Provide the explanation for the reported ratio at F_2 generation.

3. Provide an illustration of different zones of ocean. Explain the types of water flow that mix nutrients in aquatic biomes.

4. Explain the process and the enzymes are used while using plasmid for cloning. Why are the antibiotics are used in cloning?

SECTION "D"

(Short answer questions)

5. Write short notes on: (*ANY FIVE*) [5 × 4 = 20]
   a. Regulation of Citric Acid Cycle
   b. Secondary growth in dicot roots
   c. Population Growth Curve of microorganisms
   d. Gastrulation
   e. DNA fingerprinting
   f. Binomial nomenclature

6. Give major differences between: [2 × 2 = 4]
   a. Mitosis and Meiosis
   b. Incomplete dominance and codominance

7. Explain How/Why for the following: (*ANY FIVE*) [5 × 2 = 10]
   a. Oil is liquid while butter is solid at room temperature.
   b. Annual rings are not distinct in tropical areas which do not have long dry periods.
   c. Mutation in testosterone receptor gene causes testicular feminization.
   d. Reasons to use in-vitro fertilization.
   e. Population dynamics of prey & predators are interrelated.
   f. Temperature and pH regulators are important in a bioreactor.