



12. Glycerol can form triacylglycerol when  
 three glycerol molecules react with one another.  
 the acyl groups cyclize to form a multi-ring structure  
 each ester linkage is replaced with a phosphodiester linkage  
 a fatty acid is esterified to each hydroxyl group of glycerol
13. If you convert nerve cell into a stem cell through genetic reprogramming, the new stem cells thus formed will be:  
 Unipotent       Multipotent       Pluripotent       Totipotent
14. Which of the following statements about the Rb tumour suppressor protein is correct?  
 Rb is activated when phosphorylated  
 Rb binds the transcription factor E2F and thus prevents the cell from entering S phase until a mitogenic signal is received  
 Rb is a transcription factor  
 When a mitogenic signal is received, Rb binds the transcription factor E2F and thus stimulates the cell to enter S phase
15. In what way does the *ras* oncogene contribute to cancers?  
 Ras codes for an anti-apoptotic protein, which is produced in abnormally large amounts  
 Ras codes for a GTPase switch protein, which in its mutated form cannot be switched off  
 Ras codes for a transcription factor, which is produced in abnormally large amounts  
 Ras codes for a truncated form of a growth factor receptor, which is continually active

SECTION "B"

[10 Q. × 0.5 = 5 marks]

Fill in the blanks

16. \_\_\_\_\_ is used as molecular scissor in cut DNA fragments.
17. \_\_\_\_\_ is also called as semi solid media.
18. Self replication, double stranded DNA is \_\_\_\_\_
19. NAPL is \_\_\_\_\_
20. Water flow rate per cross sectional area; units of  $\text{cm}^2/\text{m}/\text{day}$  or meters/day is called \_\_\_\_\_
21. \_\_\_\_\_ live and grow in the presence of reduced compounds and with either the total absence of molecular oxygen or its greatly reduced concentration.
22. [ 5' AACCGGTT 3' ] The sequence of the complementary strand of the given DNA, from the 5' to the 3' direction is \_\_\_\_\_
23. When animal cells are proliferated under appropriate conditions, they occupy all available area of the available in the culture vessel. They are said to reach \_\_\_\_\_ at this stage.
24. CTC stands for \_\_\_\_\_
25. Smallest groupings of secondary structure made up of several elements that assemble in a consistent way are called \_\_\_\_\_

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Course : BIOT 101  
Semester: II  
F. M. : 55

SECTION "C"

[3 Q. × 7 = 21 marks]

Attempt *ANY THREE* questions.

1. Briefly describe various Microbial growth curve with its applications.
2. Explain all the tests & devices used in brief by which you can check whether "sulfur mustard" is carcinogenic, mutagenic or both in detail?
3. Describe light Biological Database and their importance.
4. You exposed a mouse in your laboratory with antigen A and antigen B. The animal was previously exposed to antigen A but not with antigen B. Explain immunological response corresponding to antigen A and B infection in detail with graphs and diagrams and explain the statement "Immunological memory depends on both clonal expansion and lymphocyte differentiation".

SECTION "D"

[Short answer questions]

5. Answer *ALL* Questions: [6 Q. × 4 = 24 marks]
  - a. Write short notes on Bioethics.
  - b. North Korea claims to have developed an agent which causes cancer within 6 hours of exposure. Do you believe in this news? Explain it with reference to a well-established theory in cancer biology.
  - c. You are planning to establish a primary culture from breast tumor in mouse. Explain all the steps involved.
  - d. Explain the intermolecular cyclization of the linear form of glucose to form glucopyranose including anomeric carbon,  $\alpha$ , and  $\beta$  designation.
  - e. Discuss the importance of phylogeny.
  - f. Write short notes on culture media.
6. Give *TWO* major difference between : [2 Q. × 2 = 4 marks]
  - a. YAC and BAC
  - b. Primary Structure and Secondary Structure of Proteins
7. Explain How / Why for the following [3 Q. × 2 = 6 marks]
  - a. Our body has genes which can possibly cause cancer.
  - b. Dendritic cell provides a link between innate and adaptive immune system.
  - c. Proof reading is necessary during polymerization.
  - d. Unsaturated fatty acids are liquid at room temperature.

