

11. Which if the following gene transcript measuring technique uses radioactive probes?
 RT-PCR Northern blot Southern blot Microarray
12. During 2D gel electrophoresis, which of the following parameter needs to be optimized.
 IEF pH gradient Acrylamide % Loading amount All of the above
13. Which of the following method of protein protein interaction determination is a high throughput method?
 Immunoprecipitaion Pull down assay
 Yeast 2 Hybrid system All of the above
14. Sarcosine, a derivative of amino acid glycine is elevated significantly in which cancer?
 Sarcoma Prostrate Lung Breast
15. Secretion of proteins to the _____ of *E. coli* offers advantages for easier and less costly purification, as fewer proteins are present in it.
 Periplasm Ctyoplasm Nucleus Mitochondria
16. The polyhedrin (polyh) gene promoter is present in which expression system.
 Yeast expression system Baculovirus expression system
 E coli expression system Mammalian expression system
17. In which type of ELISA monoclonal antibodies specific for a target antigen are bound to the surface of a well in a microtiter plate.
 Direct ELISA Indirect ELISA
 Sandwich ELISA None of the above
18. The bacterial neo gene, encoding neomycin phosphotransferase, is commonly employed in mammalian cell selection, where _____ replaces neomycin as the selective agent.
 G-118 G-218 G-318 G-418
19. Using healthy volunteers is a feature of which phase of Clinical Trials?
 Phase I Phase II Phase III Phase IV
20. The sex chromosomes of *Drosophila melanogaster* is in which chromosome??
 Chorosome 1 Chorosome 2 Chorosome 3 Chorosome 4

SECTION "B"

[10 Q. × 1 = 10 marks]

Fill in the blanks

21. Tay-Sachs disease is a fatal autosomal recessive genetic disorder caused by mutations in the HEXA gene on chromosome ____.
22. _____ is a method for determining the differences between individuals and a reference genome.

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23. IPTG stands for _____.
24. Chromosomes, which contains our genetic information in the form of genes, consists of DNA and _____.
25. Phenyl methyl sulfonyl fluoride (PMSF) is a _____ protease inhibitor, commonly used in the preparation of cell lysates.
26. In microarray, if your test sample has green color and array result shows green color, then the gene of interested is _____.
27. IPPRED is a protein-protein interaction determination software based on _____.
28. _____ is a high-molecular-weight glycoprotein which is present in higher level in 50% of women with ovarian cancer compared to healthy women.
29. In clinical trials, _____ studies are also known as label expansion, to show the drug works for additional types of patients/diseases.
30. The temperature sensitive version of GAL transcription activator is _____.

KATHMANDU UNIVERSITY
End Semester Examination
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Level : B.Tech.
Year : III
Time : 2 hrs. 30mins.

Course : BIOT 315
Semester : II
F. M. : 55

SECTION "C"

[3 Q. × 8 = 24 marks]

Attempt *ANY THREE* questions.

1. What is the importance of Clinical trials in Medical Biotechnology? Discuss different steps involved in Clinical trials? [1+7]
2. Why is it important to study protein protein interaction? Discuss in detail the different steps involved in yeast two hybrid assay? [2+6]
3. Mention different molecular diagnostic tools? Discuss about the immunological approaches to detect Protein Biomarkers of the diseases? [2+6]
4. What is polygenic gene disorder? Mention different polygenic diseases? Explain about any two different polygenic gene disorders? [1+2+5]

SECTION "D"

Attempt *ANY SIX* questions. (Q.N. 7 is compulsory)

5. What is pull down assay? How is it carried out? [1+4]
6. Discuss the basis of protein protein interaction techniques that uses prediction tools? [5]
7. Discuss how drosophila is used as a model organism for medical biotechnology? [6]
8. Discuss in short how we can modulate gene expression? [5]
9. What molecular cloning? How can we clone a gene of interest? [1+4]
10. Discuss the genetic basis of diseases? [5]
11. Write short notes on *ANY TWO* [2×2.5=5]
 - a. Transformation
 - b. Mitochondrial disorders
 - c. GWAS

10. The Fore bearing of the line AB is $S35^{\circ}W$. The back bearing of the same line AB is _____ in WCB system.
 a. 35° b. 215° c. 65° d. 235°
11. Which of the following errors in chaining cannot be corrected?
 a. Sag error
 b. Cumulative error due to incorrect chain length
 c. Error due to uneven terrain
 d. Random error due to personal mistakes
12. The contour for a map is directly proportional to _____.
 a. Scale of the map b. Extent of area
 c. Steepness of the area d. Number of contour lines
13. If a surveyor measures a distance of 50 m at a bearing of 90° , the Δ Easting will be _____.
 a. 100 m b. 50 m c. 25 m d. 0 m
14. Which of the following is NOT a type of levelling?
 a. Differential Levelling b. Triangulation Levelling
 c. Profile Levelling d. Reciprocal Levelling
15. In levelling, the difference between the Back Sight (BS) and the Fore Sight (FS) gives:
 a. Elevation of the instrument b. Height difference between two points
 c. Reduced level of a point d. Distance between two points
16. What is the purpose of the prism in a total station survey?
 a. To focus the laser beam
 b. To measure angles
 c. To reflect the laser beam back to the total station
 d. To capture images
17. What is the significance of public participation in baseline environmental surveys?
 a. Accelerates project approval b. Speeds up the construction process
 c. Reduces survey costs d. Provides additional data and perspectives
18. Which of the following is NOT a typical component of a baseline environmental survey?
 a. Vegetation assessment b. Historical site analysis
 c. Noise level measurement d. Architectural design
19. A proposed pipeline is 15 km long, and chainage markers are placed every 100 meters along its length. How many chainage markers will be required?
 a. 120 b. 150 c. 300 d. 600
20. If a road is 10 km long and 10 m wide, and it passes through a forest area between chainage 2+000 to 3+500 and 7+000 to 8+500, the approximate area of forest land required is _____ ha.
 a. 30 b. 15 c. 10 d. 3