Avinashilingam Institute for Home Science and Higher Education for Women

(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)
Re-accredited with 'A+' Grade by NAAC. Recognised by UGC Under Section 12B
Coimbatore - 641 043, Tamil Nadu, India

Bachelor's Degree Examination –August 2020
VI Semester

Class : III UG **Time : 2 Hours**
Major : Biochemistry and Biotechnology **Max. Marks: 50**

15BBTC17 Animal Cell Culture and Animal Biotechnology

Part A **10 x 1 = 10**
Choose the Correct Answer

1. Which of the following is not used for enzymatic degradation in animal cell culture?
   a. collagenase b. trypsin
   c. pepsin d. hyaluronidase

2. Pick the correct statement
   a. all human cells can grow indefinitely in culture
   b. haematopoietic stem cells show little or no anchorage dependence
   c. cultivation of tumor cells require vessels with large surface area, so that the cells can adher
   d. The ability to grow animal cells in culture shows that the ECM provides a cementing material to bind the cells together

3. Why neurons are difficult targets for gene therapy?
   a. they are not accessible b. they are small
   c. they do not divide d. they lack nucleus

4. Reason for using aminopterine in hybridoma cells is
   a. it blocks the salvage pathway b. it prevents the growth of B cells
   c. it prevents the growth of myeloma cells d. it blocks the synthesis of Ig by B cells

5. Which of the following is not used for superovulation?
   a. PMSG b. HCG
   c. HMG d. FSH

6. Histotypic culture is
   a. culturing of tissue fragments
   b. derived from characterized cell line
   c. derived from different cell lineages to create tissue like structure
   d. generation of organoids

7. Cells from the blastocyst stage of an embryo are said to be
   a. totipotent b. pluripotent
   c. multipotent d. unipotent

8. ……is used to culture anchorage dependent cells in large scale
   a. roller bottle b. hollow fibre reactor
   c. treated conical flask d. tissue culture plate

9. Pick the selectable marker used in mammalian cell culture based recombinant products production.
   a. DHFR gene b. Ampicillin resistance gene
   c. Kanamycin resistance gene d. GFP gene.

10. The cell line used in the production of rabies vaccine is
   a. Vero b. HeLa
   c. CHO d. MDCK

Part B 3x 6 = 18

Answer any Three questions

Each answer should not exceed 400 words or two pages

11. Discuss the major growth factors needed to promote mammalian cell culture growth. Indicate specific applications of each of the growth factors you have listed.

12. Elaborate on the non nutritional factors to be supplemented in a mammalian cell culture media for promoting growth of animal cells in culture.
13. You are working with a genetically modified cell line. You find a sudden decline in the growth rate of the cells. First line of inspection tells you that the cell line is contaminated. How do you identify the nature of contamination? What are the ways to eliminate contamination? Analyze the routes in which the contamination had come from.

14. Why is it necessary to characterize a mammalian cell line in culture? Explain the various methods that can be used for characterizing cells with relevant examples.

15. Discuss the factors that affect cell differentiation.

16. Explain the process of whole embryo culture and its applications.

17. Elaborate the need for the use of mammalian cell culture for the recombinant production of therapeutics. Also discuss the major features to be present in a mammalian vector.

18. What is tissue engineering? Discuss the steps in tissue engineering and its applications.

19. Explain the scale up techniques for suspension culture of mammalian cells.

20. What is super ovulation? How does it help in *in vitro* fertilization? Discuss the ways to achieve super ovulation in cattle.

Part C 2 x 11 = 22

Answer any Two questions

Each answer should not exceed 800 words or four pages

21. Elaborate the different types of media and its constituents necessary to support the growth of mammalian cells in culture.

22. Explain the advantages and disadvantages of serum free media. Add a note on the nutritional factors present in serum.

23. Explain the process of propagation and regular maintenance of mammalian cell lines.

24. Discuss flask culture and organ culture.

25. Explain the process of production of monoclonal antibody through hybridoma technology.

26. Elaborate the various techniques used in transfecting mammalian cells.

27. Explain the production of any two secondary metabolite from mammalian culture.

28. What are the advantages in producing vaccines from animal cell culture? Explain the production of any One vaccine using animal cell culture.

29. What is molecular pharming? Explain it with a case study.

30.. Explain the various methods used in gene transfer for mammalian cells.

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