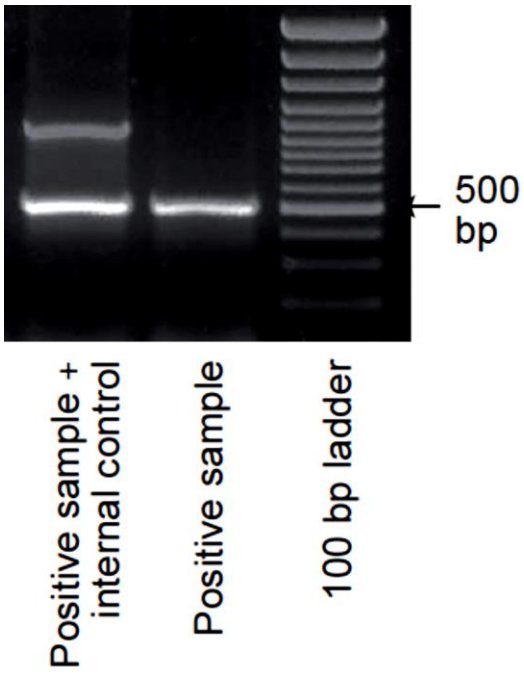
BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI, PILANI CAMPUS
MID TERM EXAMINATION: I SEMESTER: 2022-23
ANIMAL CELL TECHNOLOGY
CLOSED BOOK

Maximum Marks: 40
Maximum Time: 90min **Date: 03/11/2022**

PART A (15M)

Q1. Your friend while culturing cells suspected that her cells got contaminated with Mycoplasma. Taking your suggestions, she did a PCR and came up with a result and a gel image as follows. So is she right? What is your take on the image and further analysis to solve the issue if any? [3M]



Q2. Heena was culturing 2 different cell types: NIH3T3 cells, and HepG2 cells. Suddenly one morning while looking into the microscope she saw her cell lines are looking as shown below in Fig.1 and Fig 2

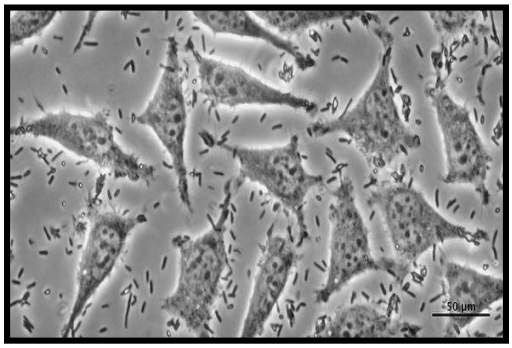


Fig.1: NIH3T3

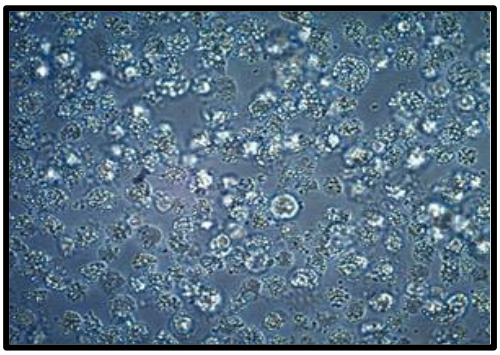


Fig.2: HepG2

She showed you the pictures and immediately as a student of ACT you knew what was the issue. How would you troubleshoot this problem for both the cell lines?
[3+3=6M]

PTO

Q3. Aniruddha was culturing HELA cells (cervical cells) but while checking for cell surface proteins he found high levels of expression of like N- cadherin and low level expression of E-cadherin. As a student of ACT what do you think is the problem. Justify with proper reasoning? [3M]

Q4. After isolation of mouse embryos and subsequent processing you tried to do primary culture of the embryonic fibroblasts. But the cells did not survive post plating and majority of the cells died the next morning. What do you think went wrong? Justify? [3M]

Part B (25M)

Q5. Answer the following question in 1 line each (3)

(i) What is the temperature of liquid nitrogen?
(ii) Suppose your friend is working with Covid 19. What would be best chemical disinfectant which he should use for decontaminating the waste generated.
(iii) Differentiate between disinfectant and antiseptic.

Q6. Can integrin be used to precondition culture flasks to facilitate the growth of fastidious cells. Justify your answer. (2.5)

Q7. What is a basement membrane? How is it formed. What is its significance in cancer metastasis? (3)

Q8. What is the difference between proteoglycan and glycoprotein? What are 2 important features of transmembrane glycoprotein mediated in cell adhesion. (3)

Q9. Enumerate 8 functions of cytoskeletal proteins. (2)

Q10. Draw the Hematopoietic cell lineage obtained after differentiation of the common myeloid progenitor cells depictng only 6 terminally differentiated cells formed. Also mention the function of any 4 of them. (2.5)

Q11. Which organ has the maximum regenerating ability. How does it normally respond to mechanical damage induced? (2)

Q12. Enumerate 4 differences between organ culture and organotypic culture. (2)

Q13. Draw a schematic diagram representing a biostatic culture used for scaling up. (3)

Q14. Suggest 2 limitations of using micro carriers for scaling up. Suggest haw they can be overcome. (2)