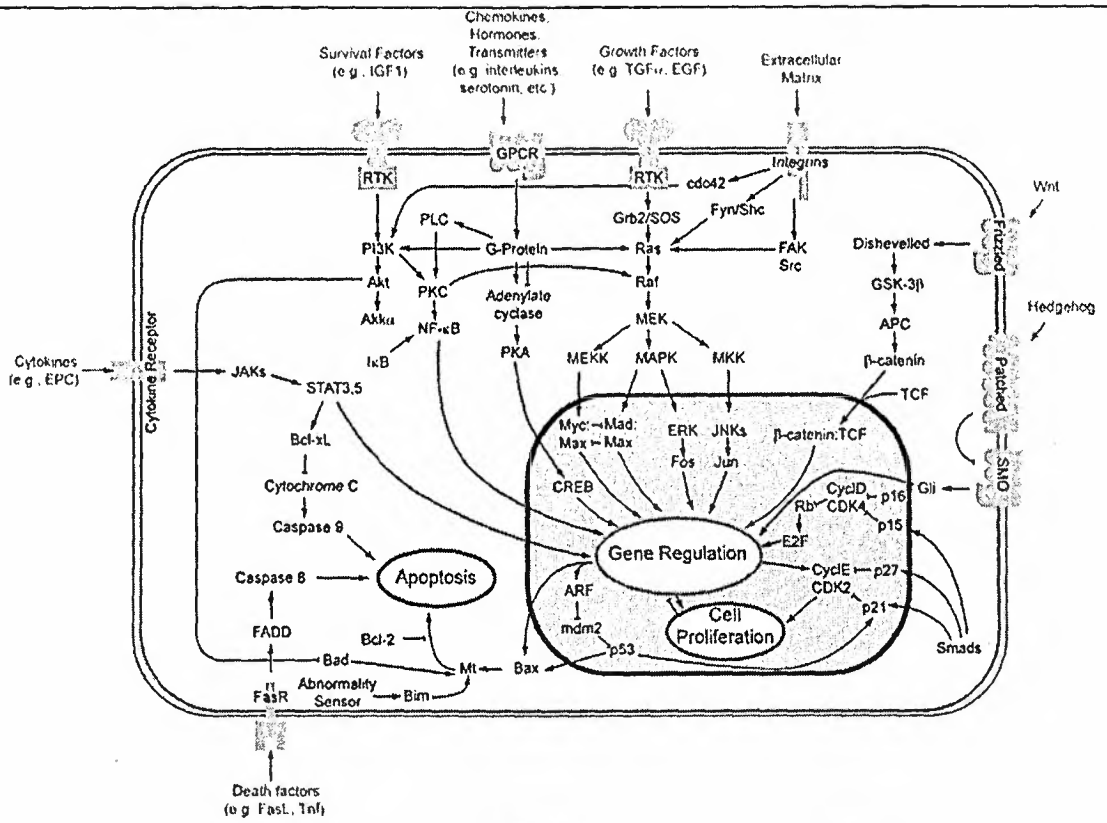
Indian Institute of Science Education and Research (IISER) Kolkata

End-Semester Examination of Cancer Biology (LS4204) Course-2019

Total Time 2:30 Hours **Total Marks: 50**



1. **(a)** Identify five proto-oncogenes and five tumor suppressor genes/gene products from the above figure **(5)**

   (b) Explain in brief why your identified genes/gene products are either proto-oncogene or tumor suppressors with respect to cancer development/hallmarks of cancer **(10 X 2 = 20)**

2. Name one gene/gene product which acts as both proto-oncogene and tumor suppressor gene. Also explain in brief about the dual role of the gene/gene product **(1 + 4 = 5)**

3. What do you mean by EMT and how it is related to cancer metastasis process? How experimentally you can determine whether a group of cells are undergoing EMT in a given condition? How you can determine the role of macrophages in EMT? **(1 +2 + 4 + 3 = 10)**

4. What do you mean by tumor specific antigens? How experimentally you can identify a tumor specific antigen in a chemically induced cancer cells (collected from a patient). **(1 +4 = 5)**

5. What do you mean by benign and malignant form of tumors? Clinicians/onco-surgeons generally recommend Adjuvant and/or Neoadjuvant therapy along with the primary treatment (say surgery) of cancer (solid tumor). What do you mean by adjuvant and neoadjuvant therapy and mention the purposes of such therapy to treat a cancer patient. **(1 + 1+ 3 = 5)**

3. What do you mean by EMT and how it is related to cancer metastasis process? How experimentally you can determine whether a compound 'X' is able to induce EMT in a group of cells in vitro? How you can determine the role of macrophages in EMT? **(1 + 2 + 4 + 3 = 10)**