**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ BMT period \_\_\_\_\_\_\_\_**

**BMT Issues Study Guide:**

Exam will include the information covered in class (All of the PP and referenced video clips are on BB:

* the 4 career power points (or your guided notes)
* the video clip on organ donation and the power point
* the power point and the video clip by Dr. Atala (linked within the pp) on Regenerative medicine
* the Nanotechnology power point and the video clip on Nanotechnology and Cancer

Please Review:

1. Pathologist (doctor that oversees the \_\_\_\_\_\_\_\_\_\_\_\_ (radiology / pathology)lab operations)
2. A radiologist and pathologist require \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Master’s / Doctor of Medicine) degree.
3. Phlebotomist \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (draws / analyzes) blood.
4. Electrocardiograph is a test evaluating the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (brain / heart) and is performed by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (electroencephalograph technician / electrocardiogram technician). This role require\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (2 years / no) formal training
5. Medical sonographer is also called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (ultrasound / nuclear medicine) technologist
6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (EPA / FDA) regulates the amount of radiation that a worker can be exposed to by monitoring the badges worn for exposure.
7. Inspecting and repairing of medical equipment is a healthcare career of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (biomedical engineer / biomedical technician)
8. Designing the instruments and machines used in monitoring and diagnosing of disease describes the tasks of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (biomedical technician / biomedical engineer) professional.
9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(biotechnologist / radiographer) is the scientist that manipulates the cells of living things to discover and improve genetic traits.
10. Dietician training requires a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(bachelor’s / associate) degree.
11. Lead amounts in paint and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (construction beams / gasoline) is regulated by the federal government.
12. Selling organs is illegal in the USA because it \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (rewards / exploits) the poor.
13. The cellular process involved in asexual reproduction is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (meiosis /mitosis).
14. Human cells possess \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pairs of chromosomes.
15. Counseling couples at risk for faulty gene transmission about selecting favorable traits before implantation is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (transgenic manipulation / eugenics).
16. Medical lab technician (prepares and runs slides, and cell counts)
17. Gene therapy is a newer medical option that is frequently offered for \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (cancer / measles) patients.
18. When one dies in a country with presumed consent, his/ her organs are automatically be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (removed and transplanted / removed after the family consents)
19. Totipotent and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (multipotent / pluripotent) stem cells are undifferentiated. This means that they can give rise to almost any cell.
20. Adult stem cells are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (totipotent / multipotent) and can only give rise to specific like-body cells and this is called differentiation.
21. Eugenics is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
22. Epigenetics is the study of heritable changes in the gene expression that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(are /are not) caused by changes in the DNA sequence.
23. Illegal aliens receiving organ transplants was the ethical issue in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ case that we studied in class.
24. Microbiologist is a life scientist that studies \_\_\_\_\_\_\_\_\_\_\_\_(microscopic /macroscopic) organisms.
25. Arranging for the surgical removal of the donated organ is performed by \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (the organ allocation organization / organ procurement organization).
26. \_\_\_\_\_\_\_\_\_\_\_\_\_ (RNA / DNA) is the chemical compound that contains the instructions to develop and direct the activities for a living organism.
27. Biotechnologists primarily work in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (private / public) industry.
28. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (organ / cell) is the basic structural unit of all living things.
29. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (regenerative medicine / nanotechnology) is the creation and manipulation of materials on an atomic, molecular scale.
30. The extracellular matrix, that is needed for scaffolds, is made up of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (acids and bases / proteins and polysaccharides)
31. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (heart valve / cornea ) is the most routinely planted body TISSUE.
32. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (brain / liver) is an organ that can be transplanted.
33. Organ selling in the USA is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (legal /illegal).
34. The insurance company of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (donor / recipient) covers the cost of the transplant procedure.
35. Gregor Mendel studied inheritance in pea plants and discovered \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ traits.
36. The process of decellularization is used in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (stem cells / tissue regeneration).
37. Biomaterials used for scaffolding should be nonreactive with human immune system, be strong enough to last until the new organ creates its own extracellular matrix, and be \_\_\_\_\_\_\_\_\_\_\_\_\_ when it is no longer needed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (removed /dissolved).
38. Give examples of the following traits:
    1. Homozygous dominant genotype \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    2. Heterozygous dominant genotype \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    3. Homozygous recessive genotype \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
39. DNA has four bases:
    1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
40. The completion of the Human Genome Project was in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
41. The biomaterial that supports the structure for cells to grow is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (scaffold / stem cell).
42. The field of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (forensic medicine / regenerative medicine) uses the patient’s own cells, biomaterials and stem cells.
43. Nanotechnology is a promising branch of biotechnology for the diagnosis and treatment of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (measles / cancer)
44. A Nanometer = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1 billionth, 1 millionth, 1 thousandth) meter
45. Review the concerns about nanotechnology from the power point
46. Be able to define:
    1. Genetics
    2. Eugenics
    3. Epigenetics