Form (B)

University of Palestine

Course No: BIPH 2315
Course Title: Pharm. Biotech.
Date: 28/05/2018
No. of Questions: (4)
Time: 2 hours
Using Calculator (No)

Final Exam For 2nd Semester.
2017/2018
Total Grade:

Instructor Name: Dr. Iyad ALQOUQA
Student No.: _____
Student Name: _____
College Name: Pharmacy/Biotech.
Dep. / Specialist: _____
Using Dictionary (No)

Question One: 40 Marks

Choose the correct one and encircle it

1. The first disorder treated with gene therapy was deficiency in____ gene. **A.** DMD **B.** OTC **C.** ADA **D.** HH	**2.** Which of the following is an example of a condition caused by a mutation in a single gene? **A.** Colon cancer **B.** Cystic fibrosis **C.** Heart disease **D.** AIDS
3. Which gene transfer technique involves the use of a fatty vesicle to carry a gene into a somatic cell? **A.** Electroporation **B.** Liposome transfer **C.** Microinjection **D.** Particle bombardment	**4.** When glucose and lactose are both available in the growth medium of a culture of E. coli, **A.** Both lactose and glucose are metabolized at similar rates. **B.** Lactose operon is not transcribed. **C.** Lactose metabolism is favored. **D.** Elevated levels of cAMP are synthesized.
5. Most current gene therapy clinical trials target **A.** SCID deficiency **B.** HIV **C.** Cystic fibrosis **D.** Cancer	**6.** The first gene therapy used cells altered outside the recipient's body and is called ____ gene therapy. **A.** Ex vivo **B.** In vivo **C.** In situ **D.** Vaccine
7. Which of the following regarding adenoviruses is FALSE? **A.** Viral nucleic acid is dsDNA **B.** Adenovirus is non-enveloped **C.** Adenovirus can only infect dividing cells **D.** Adenovirus lyses infected cells	**8.** CD4+ cells are: **A.** T helper cells **B.** cytotoxic T cells **C.** macrophages and B cells **D.** All of the above
9. Germ-line therapy is: **A.** Heritable **B.** Not heritable **C.** Sometimes heritable **D.** Unrelated to heritability	**10.** Gene therapy targets: **A.** Genotypes **B.** Phenotypes **C.** Either A or B depending on the application **D.** Both genotypes and phenotypes

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11. Lactose utilization by E. coli requires the gene _____ which transports lactose into the cell. **A.** LacZ **B.** LacA **C.** LacY **D.** LacI	**12.** Which of the following is not a researched means of delivering therapeutic DNA for gene therapy? **A.** Polymers **B.** Liposomes **C.** Bacteria **D.** Viruses
13. A nasal spray containing adenovirus carrying a functional human CFTR gene is used to treat cystic fibrosis. This is an example of ____ gene therapy. **A.** In situ **B.** In vivo **C.** Ex vivo **A.** Vaccine	**14.** Which cell type would not be a direct target for gene therapy? **A.** Muscle **B.** Liver **C.** Endothelium **D.** Red blood
15. When was the first gene therapy patient treated? **A.** 1988 **B.** 1990 **C.** 1993 **D.** 1999	**16.** What is in general not a risk factor in gene therapy using adenoviruses? **A.** Insertional mutagenesis **B.** Overexpression leading to an immune reaction. **C.** Transient expression **D.** Low pathogenicity
17. A common technique for ensuring safety in viral vectors used in gene therapy is: **A.** Formalin inactivation of recombinant virus particles. **B.** Prior immunization of the patient with the vector virus. **C.** Administration of antiviral agents during treatment. **D.** Inactivation of viral genes critical for replication.	**18.** C-peptide of human insulin is: **A.** A part of mature insulin molecule. **B.** Responsible for formation of disulphide bridges. **C.** Removed during maturation of pro-insulin to insulin. **D.** Responsible for its biological activity.
19. Which of the following cell types or systems is not part of an innate immune response to a pathogen? **A.** Phagocytes **B.** Natural killer cells **C.** The inflammatory response **D.** Cytotoxic T-lymphocytes	**20.** Which process is used to insert normal genes into human cells to correct disorders? **A.** Gene therapy **B.** Live vector vaccines **C.** Molecular cloning **D.** Stem cell therapy

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21. Which insulins should never be mixed? **A.** Rapid-acting insulins **B.** Short-acting insulins **C.** Intermediate-acting insulins **A.** Long-acting insulins	**22.** Which gene is often removed to create replication-deficient adenoviruses? **A.** E1 **B.** L1 **C.** L3 **D.** L5
23. The process of weakening pathogen is called: **A.** Vaccination **B.** Attenuation **C.** Immunization **D.** Sensitization	**24.** Plasmids are used to clone fragments: **A.** That are 35–50 kb in length **B.** Less than 15 kb **C.** 100 kb **D.** 350 Mb
25. Which of the following statements does not apply to IgG? **A.** Appears early in the primary immune response. **B.** Neutralizes bacterial toxins or opsonizes bacteria. **C.** Can fix complement. **D.** Crosses the human placenta.	**26.** The major immunoglobin in human serum is: **A.** Immunoglobin A **B.** Immunoglobin E **C.** Immunoglobin G **D.** Immunoglobin M
27. Secondary antibody responses are better because: **A.** They provide defense against unrelated antigens. **B.** The antibody can be made by both T and B cells. **C.** They do not require T-cell help. **D.** They are stronger and faster and last longer.	**28.** Adoptive transfer of acquired immune responsiveness involves the transfer of: **A.** Antibody **B.** Complement **C.** Lymphocytes **D.** Serum.
29. A discontinuous antigen epitope is: **A.** Presented by MHC molecules. **B.** Representative of only a minority of B-cell epitopes. **C.** Produced by a continuous linear peptide sequence. **D.** Produced by amino acid residues on non-adjacent polypeptide sequence.	**30.** In endogenous antigen processing, foreign antigen is presented to which type of cells? **A.** B cells **B.** Helper T cells **C.** Cytotoxic T cells **D.** Red blood cells

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31. Why is using an adjuvant in a vaccine preparation advantageous? **A.** It prevents pain during the injection. **B.** It enhances the immunogenicity of the antigen. **C.** It helps prevent back-mutations of attenuated microbes. **D.** It prevents local reactions at the injection site.	**32.** Avonex is an interferon β1a used for treatment of: **A.** Relapsing/remitting multiple sclerosis **B.** Metastatic melanoma **C.** Chronic Hepatitis C **D.** Chronic granulomatous disease
33. Which immunoglobulin would opsonize bacteria: **A.** IgA **B.** IgM **C.** IgG **D.** IgE	**34.** The effect of cytokine on multiple cell types is: **A.** Pleiotropic **B.** Synergetic **C.** Redundant **D.** Antagonistic
35. What is the onset, peak, and duration of NPH insulin? **A.** 2-4 hrs, 4-12 hrs, 16-20 hrs **B.** 1-2 hrs, 2-8 hrs, 14-24 hrs **C.** 3-4 hrs, 6-12 hrs, 18-24 hrs **D.** 2-4 hrs, 4-6 hrs, 16-20 hrs	**36.** Immunological unresponsiveness to self antigens is called: **A.** Tolerance **B.** ADCC **C.** Memory **D.** Acquired immunity
37. Pegasys is a PEGylated interferon alpha 2a used for treatment of: **A.** Arthritis **B.** Multiple sclerosis **C.** Chronic hepatitis C **D.** Chronic granulomatous disease	**38.** What is the onset, peak, and duration of Humalog insulin? **A.** 60-90 mins, 1-3 hrs, 7-9 hrs **B.** 10-30 mins, 1-1.5 hrs, 5-7 hrs **C.** 50-60 mins, 2-4 hrs, 6-8 hrs **D.** 15-30 mins, 0.5-2.5 hrs, <5 hrs
39. Retrovirus pol gene does not encode for which of the following enzymes? **A.** Protease **B.** Integrase **C.** Reverse transcriptase **D.** RNA polymerase	**40.** Aldesleukin is a non-glycosylated human recombinant interleukin-2 used for treatment of: **A.** Hepatitis B **B.** Rheumatoid Arthritis **C.** Renal cell carcinoma **D.** Hairy cell leukemia

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Question Two: 20 Marks

A. Mention the principal stages of biopharmaceutical production?

B. What are the main steps in gene cloning using restriction enzymes?

C. What are the important features included in the plasmids?

D. Interferon produced in E. coli is much more immunogenic than the same product produced in mammalian cells, why? Then, clarify how adjuvants can enhance immunogenicity?

E. Protein PEGylation has a significant impact on therapeutic effect. Explain your answer?

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Question Three: 20 Marks

A. What are the characteristic of ideal pump?

B. List the potential factors that interfere with successful targeting of protein to tumor cells?

C. What are parameters controlling the fate of particulate carriers in vivo?

D. Liposomes have gained considerable attention among colloidal particulate system proposed for site specific delivery of protein. What are the advantages of liposomes over other non-particulate systems?

E. What are the primary chemical and physical stability issues with human insulin formulations?

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Question Four: 20 Marks

A. List 2 advantages and 2 disadvantages associated with retrovirus and adenovirus the vectors used in clinical trials for cancer therapy?

B. What is the purpose of the packaging cell line during the production of recombinant viral vectors for gene transfer?

C. Several approaches used for non-viral gene transfer. List at least two of them showing their advantages and disadvantages?

D. What approaches could have been selected to prevent the growth and spread of malignant tissue? Explain the principle behind each.

E. Provide at least two examples of how gene therapy is used to modulate the immune system to fight infection.

End of Questions-*Good Luck*