University of Baghdad
College of Sciences

Biotechnology Department
Time: Three hours

Competition examination for Master candidates in Biotechnology
2015 – 2016

Select the best answer for the following questions.

1-The antistreptolysin O titter is raised in infection caused by :
a. *Streptococcus pneumouae*
b. *Streptococcus pyogenes*
c. *Streptococcus sanguis*

2- Bacteria requires X and V factors for growth
a. *S. aureus*
b. *B. anthracus*
c. *H. influenza*

3- In man the most common method of entry of the tuberele bacillus is
a. Ingestion
b. Direct through skin
c. In halation

4-Which of the following is not one of koch's postulates?
a. The organism is regularly found in lesion of the disease
b. The organism can be isolated from disease tissue in pure culture on artificial media
c. Treatment of the disease with a broad spectrum oral antimicrobial dependably eradicates the organism and cause the disease

5- Characteristics of a bacteria capsule included:
a. All bacteria have one
b. It is an important mechanism for protecting a bacteria against ingestion by PMN'S
c. It is what causes the gram satin reaction

6- What do endotoxins and exotoxins have in common?
a. Screated in to the medium
b. Causes damage to the host
c. Heat stable

7- A common type of nosocomial infection is:
a. Urinary tract infection
b. Meningitis
c. Cellulitis

8-Food poisoning caused by *S. aureus* is due to production of
a. Enterotoxin
b. Endotoxin
c. Leukosidin

9- A normal flora may be found in all the following environments except :
a. The blood
b. The vagina
c. The pharynx

10-Which of the following typhoid is believed to be immunogenic?

a. O
b. Vi
c. H

11-Antibodies (immunoglobulins):

a. Are synthesized and secreted by both B and T lymphocytes
b. Bind to several different epitopes simultaneously
c. Contain fore different light chain polypeptides
d. Tag antigens for destruction and removal

12-In humans .MHCII molecules are expressed by;

a. All nucleated cells
b. B. cells , dendritic cells and macrophages
c. Erythrocytes
d. Naive T cells

13-The thymes is the site of the initial differentiation for

a. B. cells
b. Erythrocyte
c. NK cells
d. T. cells

14-CD4 T –Cells are act as

a. Antigen presenting cells
b. Cytotoxin T- lymphocytes
c. T- helper cells
d. NK

15-The immunoglobulin that related with type 1 hyper sensitivity is :

a. IgG
b. IgG and IgM
c. IgE
d. IgA

16-Anaphylaxis is:

a. Always systematic
b. The most rapid typesensetivity reaction of the immediate type
c. None of the above

17-C3a and C5a can causes:

a. Bacterial lysis
b. Vascular permeability
c. Aggregation of C4 and C2

18-The classical pathway of complement functions:

a. Cleave immunoglobulin into Fc fragments
b. Facilitate destruction of microbes
c. Trigger histamine release

19- Which of the following molecules is expressed by mature T cell that function as a helper T cell:

a. CD8
b. IgG
c. CD4

20- Ouchterlony is:

a. Agglutination
b. Immunoglobulin
c. Hemagglutination

21-_____ have been implicated with food born disease outbreaks and occurred at a higher frequency than others.

a. *Clostridium botulinum.*
b. *Shigella* spp.
c. *Salmonella* spp.
d. Hepatitis A.

22-Food properties that facilitate growth and survival of microorganisms at refrigeration temperature and cause less death at frozen temperature are _____, in addition to the absence of microbial inhibitors.

a. Higher solid content, pH closer to 7.0, & higher water activity.
b. Lower solid content, pH closer to 7.0, & higher water activity.
c. Lower solid content, pH closer to 7.0, & lower water activity.
d. Higher solid content, pH closer to 7.0, & lower water activity.

23-Chemical compounds that kill microorganisms or control their growth in foods are called antimicrobial preservatives, they are _____.

a. Present naturally in foods.
b. Either present naturally, formed during processing, or legally added as ingredient.
c. Either present naturally, formed during processing, or legally added as ingredient.
d. Either added as ingredient or formed during processing.

24-Because of low penetration, _____ has been used to inactivate microorganisms on the surface of foods as well as in air and on walls, shelves, and equipment in the food handling and processing area.

a. □-ray.
b. X-ray.
c. β-ray.
d. UV-ray.

25-Contaminated raw vegetables and poor personal hygiene are considered the main causes of _____(intestinal protozoan). The main symptoms of the disease are acute or chronic diarrhea and abdominal pain.

a.Toxoplasmosis by *Toxoplasma gondii*.
b. Giardiasis by *Giardia lamblia*.
c.Anisakiasis by *Anisakis simplex*.
d.Taeniasis by *Taenia* spp.

26- Which of the following microorganisms is used in microbial mining?

a. Pseudomonas aeruginosa.
b. Thiobacillus ferrooxidans.
c. Pseudomonas putida.
d. Zoogloea ramigera.

27- The yield of the antibiotic depends upon:

a. PH of the medium.
b. Age of the inoculum.
c. Composition of medium.
d. All of these.

28- Vectors are:

a. Molecules that degree nucleic acids.
b. Molecules that helps in replication.
c. Molecules that are able to covalently bond to carry foreign DNA into cells.
d. Molecules that protect host cells from invasion by foreign DNA.

29- Penicillin is recovered after fermentation as:

a. Potassium penicillin.
b. Calcium penicillin.
c. Sodium penicillin.
d. Penicillin only.

30- Vegetables oil added in the fermentation medium for penicillin act as:

a. Source of nutrients.
b. Carbon source.
c. Anti foam agent
d. Both (a) and (c).

31- Ethanol is produced by:

a. Continuous fermentation.
b. Batch fermentation.
c. Both (a) and (b).
d. None of these.

32- The fermentation can be sterilized by:

a. Keeping it in oven.
b. Steam under pressure.
c. Boiling.
d. All of these.

33- Which of the following microorganisms is used for the citric acid product?

a. Lactobacillus bulgaricus.
b. Saccharomyces cercvisiae.
c. Aspergillus niger.
d. Streptococcus lactic.

34- Proteins separation can be carried out on the basis of:

a. Net charge.
b. Solubility in salt solution.
c. Size of mass.
d. All of these.

35- Yeast is used in the production of:

a. Ethyl alcohol.
b. Acetic acid.
c. Curd.

36-Why dose ice float in water?

a. The liquid water molecules have more kinetic energy and thus support the ice
b. Ice always has air bubbles that keep it float
c. Hydrogen bonds stabilizes and keeps the molecules of ice farther apart than the molecules of liquid water.
d. The crystalline lattice of ice causes it to denser than the liquid water.

37- A carbohydrate, of commonly known as dextrose is

a. Dextrin , b. D – Fructose , c. D- Glucose , d. Glycogen

38- Number of stereoisomer of glucose is

a. 4, b. 8 , c. 16 , d. none of these

39- An amphibolic pathway among the following is

a. HMP shunt, b. Glycolysis, c. Citric acid cycle, d Gluconeogensis

40-Casein, the milk protein is:

a. Nucleoprotein, b. Chromoprotein, c. Phosphoprotein, d. Glycoprotein

41- Histones are:

a. Identical to protamines
b. Protein rich in lysine and arginine
c. Protein with high molecular weigh
d. Insoluble in water and very dilute acids

42-Each turns of α helix contains the amino acid residues (number):
a. 3.6, b. 3.0, c. 4.2 , d. 4.5

43-An anion exchange resin linked to cellulose backbone

a. DEAE cellulose b. CM cellulose c. Sephadex d. none of these

44-Genetic code is
a. Collection of codon
b. Collection of amino acids
c. Collection of purine nucleotide
d. Collection of pyrimidine nucleotide

45- β –oxidation of fatty acids is inhibited by
a. NADPH, b.Acetyl CoA c. Maylonyl CoA d. none of these

46-The DNA molecule is a polymers . Its monomers are:
a. Nucleic acid, b. amino acids, c. nucleotides, d. nucleosides

47-Which of the following are pyrimidines?
a. Adenine and Cytosine b. Adenine and Guanine c. Adenine and Thymine d. Cytosine and Thymine

48-Which of the following is NOT a necessary component of translation?
a. Anticodon b. mRNA c. Ligases d. amino acid

49- Okazaki fragment occer on the ---------- and are bounded together by
a. , Leading strand polymerase b. mRNA , anticodones c. lagging strand, ligase d. tRNA ,polymerase

50-How many different condons are possible?
a.3, b. 20 c. 64 , d. 60

51- ---------- The process involves the passage of organic carbon and ions from the culture media into the bacterium

a. Ingestion b. respiration c. degradation

52 ---------- Of wastewater inhibit on or more enzymes of pathways involved in anabolism or catabolism process.

a. Salinity b.toxicity c. acidity

53-Resistance of compounds to biodegradation increase with increasing ----------

a. Aliphatic compounds b. aromatic enzyme c. polymantic compounds

54- ---------- is a process carbon

a. Anabolism b. catabolism c. secretion

55-When there is no further increase in growth with increase in substrate concentration? So the bacteria are at their ----------

a.Minimum growth rate b. Maximum growth rate c. normal growth rate

56-The color of the of the flower is due to the presences of

a.Chlorophyll b .xanthophylls c. chloroplast or anthocyanin d. florigen

57-Tmeyare modification of amino acid, they are nitrogenous compound that are bases
a.Alkaloids b. terpeniods c. phenolics d. None of these

58-Greated through the mavalonic acid pathway, they are composed of isoprene units:
a.Alkaliod b. Terpeniods c. phenolics d. all of these

59-In tobacco plant, nicotine is synthesized in ,

a.Leaves b. stems c. roots d. all of these

60-Primary function of lignin is:
a. To provide mechanical support to plant
b. To provide protection from physical , Chemical and biological attack
c. Both a and b
d. None of these

61-Secondary plant products are of great importance commerce in making:
a. Medical drugs
b. Poisons insecticides
c. Flavors and perfumes
d. All of the above

62-The influence of the chemicals released by one plant species on another plant or animals species with resulting benefits to the species which contain them , is called as
a. Allopathy
b. Allelopathy
c. Homoeopathy
d. None of the above

63-Color at tomato fruits is due to the presence of
a. Carotenoids
b. Flavonols
c. Both a and b
d. None of the above

64-Main function of flavonoids in plants is:

a. Defiance
b. Pigmentation
c. Both a and b
d. None of the above

65- Secondary metabolites are mostly accumulate in

a. Cytosol
b. Chloroplast
c. Chromoplast
d. Vacuole

66 -If a normal cell of one geneus of mammalian is 2N (40 chromosomes), what is the number of chromosomes content in the gamete cells are:
a -monosomic b - disomic c – di ploid d - haploid

67- The cells that can be used for chromosome analysis from adult (human) are:
a- skin b- lymphocytes c –bone marrow d- all of them

68- The phase that the process of crossing over occurs in cell is .....
a-anaphase b- telophase c- prophase d- metaphase

69- The traditional stain that is used in clarifies the chromosomes is.....
a-Giemsa b- methyl red c-silver stain d- trypan blue

70- Five percent of Down syndrome caused as a result of one of three types of chromosome aberration (structural) that can cause duplication and / or deletions in several genes is.....
a- inversion b-Isochromosome c- translocation d- duplication

71- In a callus culture

a. Increasing the level of cytokinin to callus induce shoot formation and increasing level of aurin promote root foe mutation
b. Increasing level of auxin to callus induces shoot formation and increasing level of cytokinin promote root formation
c. Anxins and cytokinines are not required
d. Only auxin is required for root and shoot formation

72- Protoplast is the cell devoid at:

a. Cell membrane
b. Cell wall
c. Both a and B
d. Name of the thesis

73-Oraganogensis is:

a. Formation of roots and shots on callus tissue
b. Formation of callus tissue
c. Genesis of organs
d. Both a and b

74- In tissue culture disease resistance can be obtained by

a. Soma-clorel variation
b. Meristen culture
c. Another culture
d. Somatic hybridization

75- Mass at dividing, undifferentiated cells in a tissue culture is called

a.Shield b. Callus c. an embryoid d. an aggregate

76-Protoplast can be produce from suspension cut culls tissue or intact tissue by enzymatic treatment with :

a. Cellulytic enzymes
b. Proteolytic enzyme
c. Both a nd b
d. Protolytic enzyme

77-Most plant tissue cultures are inhibited form:

a. Callus
b. Explants
c. Plantlets
d. Protoplast

78-The ability of the components cells of callus to form a whole plant is known as:

a. Redifferentiation
b. Dedifferentiation
c. Either a or b
d. None of these

79- Cellular totipotency is the property of :

a. Plants
b. Animals
c. Bacteria
d. All of these

80- Chloroplast DNA is:

a. Separate from nuclear DNA
b. Coded by the nucleus
c. Paternally inherited
d. Transformed nuclear DNA

Q2- Draw a diagram to illustrate how to clone growth hormones gene by using PBR322 as cloning vectors

Q3- Compare between the following:

1-PCR and Gene cloning
2- Western and Southern blotting

Q4- Answer each of the following

A) What is the biological function of plant secondary metabolites?
B) Name five important plant secondary metabolites
C) Enumerate the factors affecting the production of secondary metabolites in culture

Q5- Arrange the following compounds according to their ability for degradation (from easier to hard).

1. Monoaromatic 2. Alkane 3. Branching alkane 4. Polyromantic 5. Halogenated polyaromatic.

Q6 -Define the following:

a) Auxin
b) B5
c) Callus
d) Explants
e) Totipotency

Q7- Answer the following:

1- Give the name of stages of mitosis and/or meiosis, at which each of the following events occurs:

a) Chromosome are **located in a plane** at the center of spindle.
b) The chromosome **move away** from spindle equator the poles.
c) **Nuclear envelopes assemble** around two nuclei.
d) **Sister chromatids separate** to opposite poles of cell.