1- (A) Complete the following sentences (1.5 mark for each point):-

1- Host specific toxins is ....

2- Penetration of the pathogen through natural opening are ....

3- Biochemical defense in response to infection by the pathogen by ....

4- Antagonistic microorganisms mechanism through ....

5- Creating conditions unfavorable to the pathogen may be done by ....

6- Allelopathy phenomena are .... While soil suppression is ....

7- Enzymatic chemical weapons of pathogen may be classified into ....

8- Steps of disease cycle of the pathogen are ...., ..., ..., ..., ...

9- Epidemic disease is ....While epiphytic disease is ....

10- Pre-existing defense structures by means ....,...........,...........,......

2- Write short notes with labeled diagrams on the following:-

1- Soft green mold in citrus (3 marks)

2- Dissemination of the pathogen (3 marks).

3- Enzymatic degrade substances inside the plant cells (5 marks).

4- Histological defense structure (4 marks).

3- a-Write on general characteristics of rusts.   (6marks)

b-Describe the life cycle of *Claviceps purpurea*.   (9marks)

4- a- Discuss the criteria applied for the generic classification of order Peronosporales.   (7marks)

b-Write on: Sexual reproduction in *Penicillium sp.*   (8marks)

Mansoura University
Faculty of Science
Botany Department

جامعة المنصورة
كلية العلوم
قسم النبات

Final Examination in Botany
First Term: Jan. 2016

Educational Level: Second Level
Course: Nuclear and Cytoplasmic Genetics (B 205)
Time: 2 hrs   Date: 13 /1/ 2016

Program : Biotechnology

Full mark: 80   Question mark: 20

Answer the following questions:

Q.1: Choose the correct answer of <u>10 only</u>. (20 marks)

1. Which of the following is affected by genetics?
   a. Our physical features
   b. Personality and intelligence.
   c. Susceptibility to numerous diseases
   d. All of the above

2. The branches of genetics can be divided into…..
   a. Transmission genetics
   b. Population genetics.
   c. Molecular genetics
   d. Cytoplasmic inheritance   e. All of the above

3. Preformationism idea suggested that a miniature adult is present inside the egg or the sperm and that a person inherits all of his or her traits from two parents.
   a. True   b. False

4. Blending inheritance idea proposed that genetic information blends during reproduction and offspring are a mixture of the parental traits.
   a. True   b. False

5. Advances in molecular genetics have led to gene therapy and the Human Genome Project.
   a. True   b. False

6. Genes are the fundamental units of heredity.
   a. True   b. False

7. The genes that determine traits are termed the phenotypes; the trait that they produce is the genotype.
   a. True   b. False

8. Which of the following is not a character of chromosomes?
   a. Carry genes
   b. Carry RNA
   c. Partitioned into daughter cells through mitosis or meiosis.
   d. Made up of nucleic acids and proteins

9. Genetic information is expressed through the transfer of information from.
   a. proteins to RNA to DNA
   b. DNA to RNA to proteins
   c. RNA to DNA to proteins
   d. DNA to proteins to RNA

10. DNA is typically more stable than RNA
    a. True   b. False

11. Evolution requires genetic change in populations
    a. True   b. False

Q.2: What is the role of 3 only of the following?   (20 marks)

       1- Maternal inheritance in transgene confinement.   (7 marks)

       2- Vegetative segregation in plastid inheritance.   (7 marks)

       3- Paternal leakage in plasid inheritance.   (6 marks)

       4- GFP in plastid inheritance   (6 marks)

Q.3: What is the meaning of each of the following?   (20 marks)

    1- *Lycopersicon* type of plastid inheritance   (5 marks)

    2- Genomic imprinting   (5 marks)

    3- Biparental inheritance in nucleus and cytoplasm   (5 marks)

    4- Genetic maternal effect   (5 marks)

Q.4: Answer all the following.

    A- Draw the scheme illustrating the changes in the organeller DNA in the four types of generative cell.   (13 marks)

    B- Draw the diagram describing the gametophytic and sporophytic self-incompatibility in flowering plants

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Best Wishes: Dr. Ashraf Elsayed   Dr. Yasmin Heikel

Answer the following questions

Q1. Discuss shortly each of the following: (15 Marks)

a- Auxins biosynthesis and its transport.

b- Transcription and translation.

Q2. Write an account on the following: (15 Marks)

a- Gibberellins biosynthesis and their mode of action in induction of some hydrolytic

enzymes.

b- Codon and anticodon

Q3.what do you know about each of the following:

a- CO_2 fixation by calvin cycle. (7 marks)

b- Kenndey Pathway for triacylglycerol biosynthesis. (6 markes)

c- Chitin …………………………… (2 markes)

Q4. Explain each of the following:

a- Two routes of sucrose synthesis. (3 markes)

b- Fermentation reaction. (3 markes)

c- Glycolysis. (6 markes)

d- Cis and trans bonds in unsaturated fatty acid. (3 markes)

Examiners:

Prof. Heshmat S Aldesuquy   *Prof. Samia A Haroun*

Answer The Following Questions:

I- **Classify the different types of biomolecules synthesized in living cells** (15 marks).

II- **Give a bridged review on "The history and development of biotechnology"** (15 marks)

III-A- Illustrate <u>only</u> by a labeled diagram (5 marks);

1- The microprojectile bombardment apparatus
2- How to construct a recombinant cell

B- Give reasons for the following points (10 marks);
 1- One plant cell could generate a whole plant body
 2- *E. coli* is the most common organisms in biotechnology
 3- Ti plasmid mediated gene transfer is limited to a few kinds of plants
 4- The instant production of endotoxin is better that the continuous production

IV-   **A- Briefly explain the following points (5 marks);**
   1- The different uses of plant growth promoting bacteria
   2- The generation of herbicide resistant plants

   B- Explain the following terms (8 marks);
    1- Liposome fusion
   2- Metabolic engineering
    3- Opine synthesis in *Agrobacterium*
    4- *Agrobacterium* as a pathogen and tool

C- The dyes used in textile industry represent an environmental problem that contaminating the water and they have negative effect on the public health and you are requested to solve this problem. Introduce your proposal to solve this problem (2 marks).

Best of Luck
Prof. Mohammed Nagib
Dr. Amr M. Mowafy

Answer the following questions:

Question 1: (15 marks)

a. **Complete each of the following statements: (10 marks)**

1. A titration curve is a plot of .... vs. ....
2. Eriochrome black T and murexide are .... and known as..................
3. Post precipitation can be avoid by................or.....................
4. In Tswett experiment,............is the stationary phase while .... is the mobile phase.
5. There are two types of atomization techniques which are ....and ....

b. If **20 cm^3** of **0.1 mol.dm^{-3}** NaOH solution is added to **30 cm^3** of **0.1 mol.dm^{-3}** benzoic acid, C_6H_5COOH, solution. Calculate the pH of the resulting solution given that the **pK$_a$** of benzoic acid is **4.5**. **(5 marks)**

Question 2: (15 marks)

a. **Give the scientific term for each of the following statements: (10 marks)**

1. A solution which resists the change in its pH when either **OH$^-$** or **H$^+$** are added.
2. Special type of adsorption where the impurities are trapped within the crystal lattice.
3. Elimination of gases from solvents in **HPLC** prior to analysis of sample.
4. Separation of particles into individual molecules and breaking molecules into atoms.
5. Occurs when an excited molecule relaxes to a metastable excited electronic triplet state.

b. Calculate the concentration of chloride ions in a solution formed by adding lead chloride, **PbCl$_2$**, to water. The solubility product constant of lead chloride is **1.5 × 10^{-6}**. **(5 marks)**

Question 3: (15 marks)

a. **Compare between each pair of the following: (10 marks)** (المقارنه توضع في شكل جدول)

1. **Mohr's** and **Volhard's** method. (titrant, indicator and end point)
2. **TCD** and **FPD** (type of signal and selectivity)

b. Two solutions of a substance are mixed as following: **(400 mL of 3 M first solution + 600 mL of 2 M second solution)**. What is the molarity of the final mixture? **(5 marks)**

Question 4: (15 marks)

a. **Sketch the diagram which represents:** hollow cathode lamp (HCL). **(5 marks)**

b. **Comment on each of the following: (5 marks)**

1. **EDTA** considered being a good chelating agent.
2. **O$_2$** cannot be used as a carrier gas in GC instrument.

c. Calculate the molar absorptivity coefficient of **K$_2$CrO$_4$** at 455 nm, given that: **0.2 M** of K$_2$CrO$_4$ exhibits **20%** transmittance in a **1-cm** cell. **(5 marks)**

Good luck: Dr. Hany Moustafa

اجب عن الأسئلة الآتية:-

السؤال الأول:- (25 درجة)

أ) عرف كل من المعادلة التفاضلية – رتبة المعادلة التفاضلية – درجة المعادلة التفاضلية

ب) اوجد حل المعادلات التفاضلية الاتية:

$i)$ $\quad \dfrac{dy}{dx} = e^{x-y}, \qquad ii)$ $\quad \dfrac{dy}{dx} = \dfrac{y^2\,(y+1)}{1-2xy(y+1)}$.

ج) عرف تجانس الدالة $f(x,y)$ ثم اوجد حل المعادلة التفاضلية $\quad \dfrac{dy}{dx} = \dfrac{x}{y} + \dfrac{y}{x} + 2$

السؤال الثانى:- اوجد حل المعادلات التفاضلية الاتية : (20 درجة)

$i)$ $\quad y'' - 7\,y' + 12y = 12\,x^2 + 10x - 11,$

$ii)$ $\quad y'' + y = \tan x$.

$iii)$ $\quad y'' + y' = 0, \qquad y'(0) = -\dfrac{1}{2}\;, \quad y(0) = 1$.

السؤال الثالث :- (20 درجة)

أ) اوجد حل المعادلة التفاضلية $\quad i)$ $\quad y' = \dfrac{x+y}{x} + \cos\left(\dfrac{x+y}{x}\right) - 1$

ب) ناقش استقلالية الحلول $\quad y_1 = e^x \;,\; y_2 = e^{2x},\; y_3 = e^{3x}$

ج) اوجد حل النظام $\quad \dfrac{dx}{dt} = 2x + 3y\;, \qquad \dfrac{dy}{dt} = 2x + y$

السؤال الرابع :- (15 درجة)

اجريت تجربة على عدد 200 من البكتيريا. بعد ساعة واحدة لوحظ أن عدد البكتيريا أصبح 300. اذا كان معدل نمو هذه البكتيريا يتناسب مع عدد البكتيريا عند اى لحظة. أوجد الزمن اللازم حتى يصل عدد البكتيريا الى 600.

مع أطيب التمنيات بالنجاح والتوفيق
د/ محمود عبد العزيز البيومى