STYLE OF QUESTIONS

Note: These questions are not what I will bring in the exam and are not all the types…..only examples. They do not cover all the lectures entering in the exam. They are only an example and all items in the lectures are important and can come in the exam.

Q. Mention one difference between members the following pairs

1. Chromosome number and structure of Anaphase I and Anaphase II of Meiosis

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2. G1 and G2 stages of the cell cycle

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Q. Write the scientific term

1. The process in which a bacterial cell transfers genetic material to another cell by cell-to-cell contact (……)

2. The process in which bacterial DNA is moved from one bacterium to another by a bacteriophage (……)

3. It is a discrete densely stained non-membranous structure composed of proteins and nucleic acids found within the nucleus of eukaryotic cells.

(……)

4. A type of chromosome, in which the centromere is in its middle and its two arms are almost equal (……)

5. The transmission of genes from one generation to another in the same species. (……)

6. The process in which non-sister chromatids of homologous chromosomes may exchange segments over regions of homology.

(……)

7. The process by which the cell membrane is pinched off and allowing the cells to mitotically divide producing daughter cells.

(……)

8. The introduction, uptake and expression of foreign genetic material either naturally or artificially.

(……)

9. X-Shaped chromosomes.

(……)

10. It includes cellular and nuclear divisions.

(……)

11. Mitotic stage in which sister chromatids split apart at their centromere and begin to move to opposite poles of the spindles.

(…….)

12. Successfully pass accurate DNA strands from parental genomes to daughter cells.

(…….)

13. The process of exchanging segments over regions of homology.

(…….)

14. It hanged the chromosomes to the spindle microtubules through divisions.

(…….)

15. An organism possesses numerous copies of each chromosome in its cell.

(…….)

16. A type of HGT by which antibiotic drugs become ineffective due to the transfer of antibiotic-resistance genes between bacteria

(……...)

Q. <u>Choose the correct answer</u>

1. When an organism possesses numerous copies of each chromosome in its cell, it is called …… organism.

a) Polyploidy
b) Diploid

c) Haploid

2. Which of the following represents the correct order of the phases of the cell cycle?

a) G1-G2-S-M

b) G1-S-G2-M

c) G2-M-G1-S

3. Skin cells are constantly replaced by new ones through …….

a) Cell cycle

b) Meiotic divisions

c) Mitotic divisions

4. ……. occurs when genetic materials are transferred by cells contact or by a special connection.

a) Asexual reproduction

b) Transduction

c) Conjugation

5. In ……, the produced cells have reduction in chromosome structures, while in ……. , the produced cells have reduction in chromosome numbers.

a) Meiosis I / Meiosis II

b) Meiosis II / Meiosis I

c) Meiosis I / Mitosis

6. …….. look the same, occur in pairs, control the same traits.

a) Non-homologous Chromosomes

b) Sex-Chromosomes

c) Homolougous Chromosomes

Q. <u>Answer the following questions</u>

1. Define the horizontal gene transmission. What are its major and minor ways of transmitting the genetic materials? Mention them.

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2. What is the importance of Mitosis in our daily life? Citation Only

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3. Chemotherapy affects both normal and cancer cells. Explain briefly

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Q. <u>Complete</u>

a) …….. are the microtubules that pull the sister chromatids apart in Anaphase.

b) …… increases genetic diversity in a species but …….. creates genetically identical daughter cells.

c) …….. and …… are methods used to insert novel genes into plants for fungal or salt tolerance.

d) Chromosomes may be …….. or …….. or …….. according to their structures.

Q. <u>Put right (√) or wrong (X) and correct the wrong words</u>

a) Non-homologous chromosomes are identical and carry the same type of information. (……)

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b) The kinetochore is a constricted region of the chromosome containing a specific DNA sequence joining the chromatids together. (……)

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c) The cell cycle consists of four stages with two DNA damage check points. (……)

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d) In vertical gene transmission, the genetic material is transferred from one generation of to the next one. (……)

b) Transduction is a process used to insert novel genes directly into plant for fungal or salt tolerance. (……)

c) In Conjugation, the donor bacteria always ensure that the recipient bacteria do not already contain a similar element. (……)

Q. <u>Mention the importance (or function) of the following</u>

1. Mitosis

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2. The synaptonemal complex

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3. Chemotherapy on cancer cells

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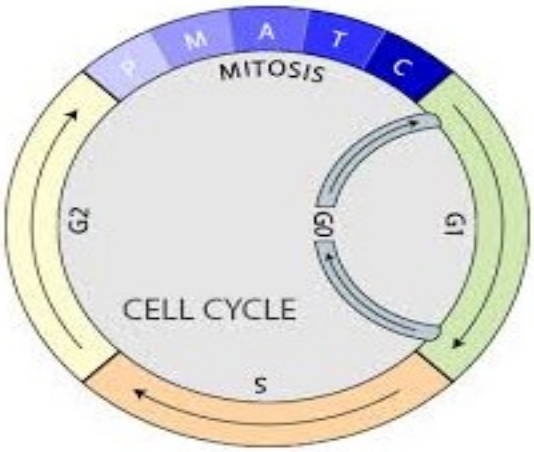
Q. <u>Label the following Cell Cycle with all Multiple Checkpoints in their specific places.</u>



Q. <u>State the name of the specific stage (or phase) characterized by</u>

1) Ring and rod-shape bivalents

(……)

2) Arrest of cells

(……)

3) Bead-like structures

(……)

4) Decondensation of chromosomes

(……)

5) Appearance of X-shaped figure of chromosome in Prophase I.

(……)

6) Centromeres split in Meiosis

(……)

7) Synaptonemal complex formation

(……)

8) Check the successfully pass of accurate DNA strands from parental genomes to daughter cells

(……)

9) Cytoplasmic division of germ cells

(……)

10) Sister chromatids with different genes

(……)

11) A cell having four sets of chromosomes

(……)

12) Stage between the two Meiotic divisions

(……)

13) Attachment of spindle fibers to the chromosome

(……)

14) **F^+ in *E. coli***

(……)

Q.4. Read *the latest top news headlines* then answers the following questions

I. At *Reuters*.com (Wed. 26 Nov. 2014)

The Western world's first gene therapy drug (Glybera) from Dutch biotech firm UniQure and its unlisted Italian marketing partner Chiesi is set to go on sale in Germany. It fights an ultra-rare genetic disease called lipoprotein lipase deficiency (LPLD) that clogs the blood with fat. The drug consists of a harmless modified virus that carries a corrective gene into the body's cells.

a) **What is the name of this method?**

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b) To what genetic transmission it belongs to?

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c) How can this method be done naturally? Citation

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II. At *The New York Times*.com (Tues. 4 Nov. 2014)

Biotech potato tubers were developed by the J. R. Simplot Company, an initial supplier of frozen French fries to McDonald's since the 1960s has been approved for commercial planting, by the Department of Agriculture of USA on Friday. They were genetically engineered to reduce the amounts of a potentially harmful ingredient (acrylamide) in French fries and potato chips, which is suspected of causing cancer in people, when the potato is fried.

How can we do it? Name the methods and their ways.

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III. At *Healthline news*.com (Frid. 18 Oct. 2013)

Though the human body contains trillions of bacteria and (usually) remains healthy, many bacteria continue to evolve to outsmart (resist) current antibiotic medications. Tom Frieden, director of the U.S. Centers for Disease and Control and Prevention (CDC), warns that we're buying time on the biological clock and that current medications soon will not be able to cure people of life-threatening infections.

a) **What is the name of this method?**

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b) Did the mentioned bacteria will contain multicopy of the same gene? Why?

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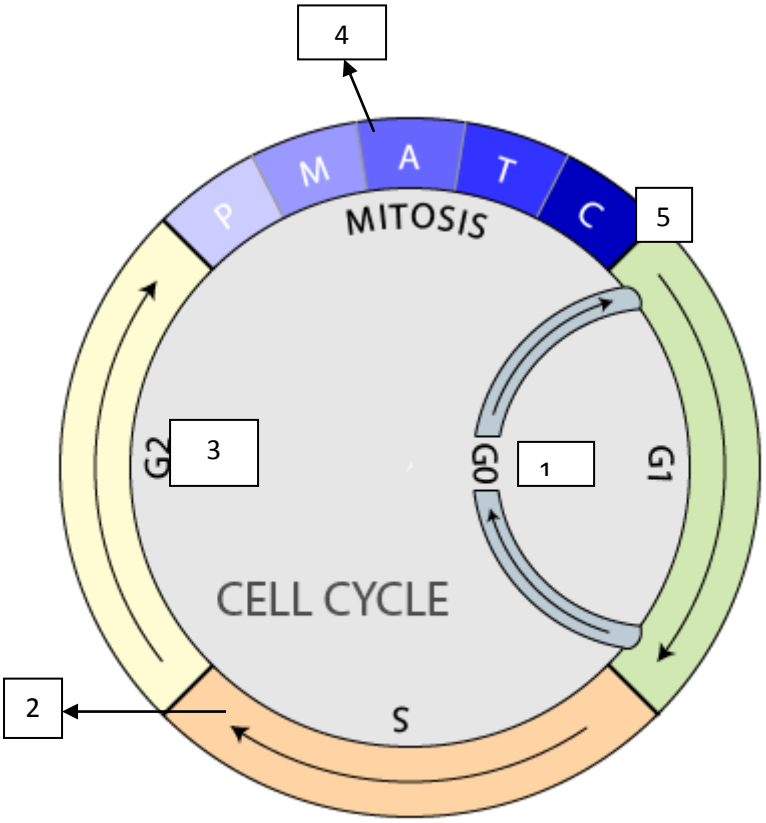
Q. Look at the cell cycle, and then answer the following questions



1. In this stage, the cell may ……..…….. or ……..…….…… the cell cycle.

2. Importance of this checkpoint:

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3. The different name of this stage:

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4. Name of this checkpoint:

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5. At this point, there will be two new daughter cells by forming …….. in animal cell and …….. in plant cell.

Q. Report the <u>FUNCTION</u> of the followings

1) Cohesin proteins

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2) Shugoshin proteins

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3) Synaptonemal complex proteins

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4) Crossover:

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5) Kinetochore

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