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Biology 9 Review

Multiple Choice: Circle the best answer. **1 mark** each.

1) To use a microscope properly:

- a) Use the coarse adjustment to focus with the 10x objective lens
- c) Carry the microscope by the base

- b) Only move the specimen slide while using the 4x objective lens
- d) Unplug the microscope by pulling on the cord, the head of the cord is dangerous

2) Which of the following is a DNA base pair?

- a) Cytosine and Thymine
- c) Guanine and Uracil

- b) Adenine and Guanine
- d) Adenine and Thymine

3) Mitosis:

- a) Produces two different diploid cells
- c) Produces two identical diploid cells

- b) Produces 4 different haploid cells
- d) Produces 4 identical haploid cells

4) Meiosis (whole process):

- a) Produces two different diploid cells
- c) Produces two identical diploid cells

- b) Produces 4 different haploid cells
- d) Produces 4 identical haploid cells

5) The gamete cells can have incorrect chromosome numbers if

- a) the cell duplicated too many chromosomes
- c) the cell's nucleus did not disappear during prophase 2

- b) the cell did not separate the chromosomes properly during anaphase 1
- d) the cell did not divide properly during cytokinesis

6) The Centriole

- a) Keeps the cell centered
- c) Creates the Mitotic Spindle for cell division

- b) Creates Ribosomes
- d) Centers the nucleus when performing mitosis

7) Chromosome Cross Over is:

- a) when two chromosomes exchange DNA during Meiosis
- c) when two chromosomes form an X-shape

- b) when chromosomes cross over to the other side of the cell
- d) when two chromosomes exchange DNA during Mitosis

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8) Which of the following is **not** done when a fire in the lab starts when using a Bunsen Burner?

- a) The fire extinguisher is used on large fires
- b) The emergency gas shut off is activated
- c) The fire alarm is pulled
- d) The fire blanket is used on anyone on fire

9) Which of the following is **true**?

- a) DNA can never be removed from the nucleus
- b) Humans have a total of 23 chromosomes in body cells
- c) DNA has a double helix shape
- d) DNA is contained in the nucleolus

10) A specialized organelle that sorts and packages proteins for transport is called

- a) The nucleus
- b) The centriole
- c) The nucleolus
- d) The golgi body

11) Which of these organelles are only found only in plant cells?

- a) Vacuole
- b) Smooth ER
- c) Cell Wall
- d) Cell Membrane

12) Independent assortment

- a) Is when the chromosomes line up in any order during metaphase 1
- b) Is when the chromosomes line up in any order during metaphase 2
- c) is when the chromosomes exchange DNA during prophase 1
- d) is when the chromosomes exchange DNA during prophase 2

13) Which of the following is a nucleotide **not** made of?

- a) Deoxyribose
- b) Phosphate
- c) Nucleic bases
- d) Ethanol

14) A diploid organism has 22 pairs of chromosomes. It creates haploid gamete cells. How many chromosomes does each gamete have?

- a) 22
- b) 46
- c) 11
- d) 44

15) Which of the following affects the **mating** phase of some animals?

- a) Internal fertilization
- b) The local geography and environment
- c) Cross-pollination
- d) Embryonic development

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16) When smelling a chemical

a) if it is safe, chemicals can be directly inhaled in the lab

c) the scent is wafted from the bottle from a distance towards you

b) The bottle is pointed away from you and smelled in the air around the area

d) A small amount can be added to a test tube to be smelled

17) A hydra creates a smaller version of itself that grows off of its side until it leaves and becomes a smaller, identical organism. This is an example of:

a) Binary Fission

c) Fragmentation

b) Sexual Reproduction

d) Budding

18) The mitochondria

a) provide energy to the cell

c) provide sugar for the cell

b) use photosynthesis

d) all of the above

19) A daughter cell

a) Is a cell that always produces a female embryo

c) Is the name of a cell resulting from the processes of mitosis or meiosis

b) Is a cell that is identical to a parent cell

d) Always has a Y-chromosome

20) Cross Over Events

a) are when chromosomes move to either side of the cell

c) are during meiosis when chromosomes exchange pieces of DNA before separating

b) are during mitosis when chromosomes exchange pieces of DNA before separating

d) are when chromosomes are duplicated by crossing over one another

21) Which of the following is part of cell theory?

a) Organisms are made up of more than one cell

c) DNA is the basic unit of a cell

b) Cells come from previously existing cells

d) Cells see cells selling cellulose to cells

22) To see a slide at 40x magnification under a microscope, use the

a) 4x objective lens

c) 40x objective lens

b) 10x objective lens

d) 400x objective lens

Matching

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Letter	Term	Description
L	1) Binary Fission	a) Cells that continue to divide forever using mitosis due to mutations
P	2) Gamete Cells	b) A growth forms off the side of an organism and leaves the parent to form an identical organism
I	3) Spores	c) Chromosomes with the same types of genes and similar size, but possibly with different versions of the genes
J	4) Zygote	d) A molecule that is coded by a gene and can perform various functions in a cell
E	5) Fragmentation	e) An organism is damaged and cut into pieces, which reproduce asexually and form new, identical organisms
G	6) Embryo	f) A new cell/organism that is identical to the original cell/organism
K	7) Stamen	g) A stage in sexual reproduction where the fertilized cell has further developed using mitosis and is beginning to form organs and tissue
D	8) Protein	h) A plant capsule from a plant's stigma that contains a zygote and a food storage.
A	9) Cancer	i) Haploid cells that are released by fungi to form new, identical fungi
B	10) Budding	j) An egg cell that has been fertilized by a sperm cell
M	11) Vegetative Reproduction	k) The male reproductive organ of a plant. Creates pollen.
F	12) Clone	l) Bacteria use this to divide into two identical cells without mitosis
C	13) Homologous Chromosome Pair	m) Plant asexual reproduction method that uses special structures like bulbs and tubers
O	14) Sister Chromatids	n) An organism which requires two other species to undergo sexual reproduction
H	15) Seed	o) Chromosomes that are exactly identical, made by duplication, and attached by a centromere
N	16) Hybrid Species	p) Haploid cells that are produced by Meiosis

Short Answer Section:

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1) The stage that comes before meiosis is called **Interphase**. During this stage:

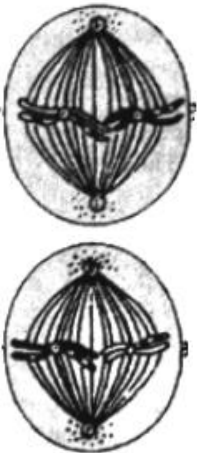

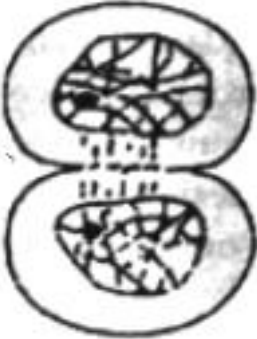
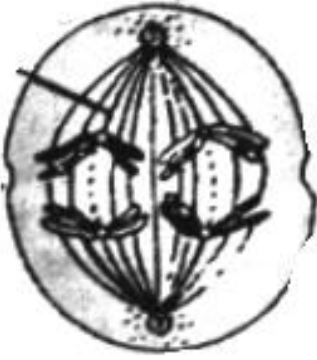


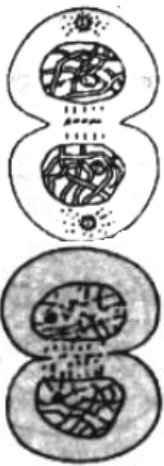

- the cell will **grow**,
- and the DNA will **duplicate**



(1 mark)

2) Name each of the pictures of Meiosis. The diploid number is 4 and the haploid number is 2. **Place a star** on the stage where the **cross over event** can happen.

Place a triangle on the stage where **independent assortment** occurs. (5 marks)

	 *		
Metaphase 2	Prophase 1	Telophase 1	Anaphase 1
			 Δ
Prophase 2	Anaphase 2	Telophase 2	Metaphase 1

3) What are the pros and cons of internal and external fertilization? (2 marks)

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	Internal Fertilization	External Fertilization
Pros	<ul style="list-style-type: none">• Offspring have high survival chance from parental care and nutrients	<ul style="list-style-type: none">• More zygotes made• Zygotes are more spread out to avoid competition• Less energy cost
Cons	<ul style="list-style-type: none">• Less zygotes made• Higher energy cost	<ul style="list-style-type: none">• Offspring have a low survival chance from low parental care

4) Describe three ways mitosis and meiosis differ. (3 marks)

- Different number of cells produced
- The cells produced are genetically different
- Each process ends with different ploidy
- Meiosis has two division, mitosis has one
- Meiosis contains crossing over and independent assortment
- Not all Meiosis cells will be used
- Meiosis two separates the homologous chromosome pairs

5) What is a gene? How does a gene affect an organism/ a cell? (1 mark)

- A gene is a part of the DNA that encodes a protein
- The protein has a direct impact on many **traits** and cell functions. Changes to a gene will result in changes at the cell level and trait level

6) a) Describe In Vitro Fertilization. (1 mark)

In Vitro Fertilization – fertilization of an egg with sperm on a petri dish. The zygote grows into an embryo and is implanted into a mother/surrogate mother

b) Are there any ethical problems with In vitro fertilization? Describe why it is or is not a controversial topic. (1 mark)

Many ethical questions have arisen, such as if someone should or should not know they were born using In Vitro Fertilization

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7) a) Describe an advantage to sexual reproduction. (1 mark)

- **Increased genetic diversity**

b) Describe an advantage of asexual reproduction. (1 mark)

- **Asexual reproduction can create new organisms much quicker and in high numbers**

8) a) Describe pollination in flowers. Use the words stigma and stamen. (1 mark)

A pollen grain will be transported from the anther of a flower to the stigma for sperm to fertilize the egg cells in the stigma and form a seed.

b) Why do pollinators help the plants? (1 mark)

Nectar/food, bright colours, smells

c) Describe an advantage and a disadvantage to pollination. (1 mark)

- **Pro: The method does not require energy.**
- **Con: The process relies on other species and random chance.**

9) What three things give Meiosis the ability to create haploid cells that differ? (1 mark).

Crossing over, independent assortment, the gamete used for sexual reproduction is chosen at random

b) When is a cell "haploid" during meiosis? (1 mark)

At the end of meiosis 1, so Cytokinesis 1/Prophase 2

10) What do you do if there is a spill in the lab? (2 marks)

One partner gets the teacher, the other partner keeps others away from the spill

If the chemical is safe, clean-up using paper towel. If it is not safe, it needs to be cleaned up with special procedures.

If the chemical spilled on someone, they must use the safety shower, eye wash station or sink to wash the area spilled on for 15 minutes.