

1. During inhalation, which of the following is true of the chest cavity?
 - a) volume increases and pressure decreases
 - b) volume decreases and pressure increases
 - c) both volume and pressure increase
 - d) both volume and pressure decrease
2. The white blood cells are primarily responsible for:
 - a) clotting
 - b) transporting CO₂
 - c) fighting infection
 - d) transporting O₂ and CO₂
3. In the human, gas exchange occurs in:
 - a) the bronchioles
 - b) alveoli
 - c) blood
 - d) cells
4. Which of the following is not true about carbon dioxide?
 - a) it is dissolved in the blood plasma
 - b) it combines with the water in your plasma to produce carbonic acid
 - c) it combines with the water of the cytoplasm in your red blood cells to produce carbonic acid
 - d) it is transported by the white blood cells
5. Nondisjunction of one chromosome during meiosis can result in:
 - a) a trisomy
 - b) a translocation
 - c) a deletion
 - d) a point mutation
6. When a person has pneumonia, the blood from the infected lung carries less oxygen than normal. What might be the reason?
 - a) O₂ dissolved better in liquids than in air
 - b) the chest cavity gets smaller as the person breathes
 - c) excess fluid in the lung does not allow proper gas exchange
 - d) the concentration of carbon dioxide is high in the alveoli
7. Smoking too many cigarettes will directly affect:
 - a) swallowing & the epiglottis
 - b) peristalsis of the oesophagus
 - c) movement of the cilia
 - d) the voice box
8. The most important reason for breathing through the nose is because:
 - a) it prevents the possibility of choking on food
 - b) it limits the rate at which air can enter the lungs
 - c) air is warmed and some microbes are filtered out
 - d) so one doesn't appear rude
9. Which of the following is the correct pathway that air follows to the lung:
 - a) alveolus - bronchus - nasal cavity - trachea
 - b) alveolus - bronchus - trachea - nasal cavity
 - c) nasal cavity - trachea - bronchus - alveolus
 - d) nasal cavity - trachea - alveolus - bronchus
10. Carbon dioxide is carried in the blood primarily as:
 - a) CO₂
 - b) HCO₃⁻
 - c) H₂CO₃
 - d) CO₃⁻
11. Oxygenated blood enters the heart in the:
 - a) right atrium
 - b) right ventricle
 - c) left atrium
 - d) left ventricle
12. Which is **true** of the large intestine?
 - a) it removes water
 - b) it has a large surface area
 - c) it absorbs nutrients
 - d) it has no peristaltic movement
 - e) it is longer than the small intestine
13. When small nutrients pass through the intestinal wall, this is called:
 - a) egestion
 - b) absorption
 - c) ingestion
 - d) digestion
14. Which of the following is true?
 - a) the pancreas produces hydrochloric acid
 - b) bile is made in the gall bladder
 - c) the liver has many different functions
 - d) vitamin K is made in the small intestine
15. Which of the following is false?
 - a) anemia is a problem with the blood
 - b) asthma is a constriction of breathing passages
 - c) hepatitis is an infection of the liver
 - d) a stroke is a problem with the aorta
16. Which is correct?
 - a) the ventricles fill with blood first
 - b) the SA node causes the contraction of the ventricles
 - c) the SA node starts then contract of the atria and then signals the AV node
 - d) blood travels away from the heart through the vena cava
17. Choose in order of complexity from least complex to most complex:
 - a) cell, tissue, organelle, organ
 - b) organelle, cell, tissue, organ
 - c) tissue, organelle, organism
 - d) cell, organelle, organ, tissue
 - e) organelle, cell, organ, tissue
18. The basic units of protein are:
 - a) monosaccharides
 - b) amino acids
 - c) lipids
 - d) glycerol
19. The process of mitosis:
 - a) reduces a diploid cell to a haploid cell
 - b) produces identical cells
 - c) produces gametes in humans
 - d) occurs within the ovary
21. If a sperm cell contains 18 chromosomes, a muscle cell from the same organism will contain:
 - a) 9 chromosomes.
 - b) 9 pairs of chromosomes.
 - c) 18 chromosomes.
 - d) 18 pairs of chromosomes.

22. The physical appearance of an organism for a particular trait is its
a) genotype. b) pedigree.
c) phenotype. d) recessiveness.

23. In determining the colour of watermelon fruit, let G represent the green colour and g represent the striped colour. If two Gg plants are crossed, what is the probability of offspring with the homozygous recessive genotype?
a) 0% b) 50%
c) 75 % d) 25 %
e) 100 %

24. In fruit flies, normal body colour (N) is dominant over ebony body colour (n). If all the F₁ generation have normal body colour, which of the following are likely to be the genotypes of the parents?
a) Nn x Nn b) nn x Nn
c) nn x nn d) NN x Nn

25. Colour-blindness is a sex-linked characteristic because the gene is:
a) dominant.
b) recessive
c) carried on an autosome
d) carried on a sex chromosome.

26. Down Syndrome
a) occurs only in females.
b) occurs in males and females equally
c) is a result of an extra chromosome.
d) is caused by a missing chromosome.
e) occurs only in males.

27. The intestinal villi of the human small intestine function primarily to:
a) increase the surface area for absorption of digested nutrients
b) excrete metabolic wastes
c) circulate blood
d) force the movement of food in one direction through the digestive tract

28. Which of the following enzymes breaks down fats?
a) amylase b) maltase
c) trypsin d) lipase
e) dissacharidase

29. Which part of the human blood is primarily responsible for transporting nutrients, hormones, gases, and wastes?
a) red blood cells
b) plasma
c) white blood cells
d) platelets

30. Which structure is used by both the digestive and respiratory systems?
a) nasal cavity b) pharynx
c) bronchi d) alveoli

31. Which of the following is not a kingdom?
a) Eubacteria b) Protista
c) Plantae d) Fungi
e) Viruses

32. Which of the following is not a characteristic of a member of the kingdom Protista?
a) are only heterotrophic
b) more recent than the bacteria
c) have membrane-bound organelles
d) most are microscopic and unicellular
e) Live in aquatic or moist places

33. An arbitrary dominant trait is located on the X chromosome. A father will transmit the gene and the resulting condition to
a) all his daughters
b) all his sons
c) half his daughters
d) daughters and sons equally

35. Which defines an allele?
a) a portion of the DNA molecule
b) alternate forms of a gene
c) the location along a chromosome of a particular DNA sequence
d) the condition when a pair of chromosomes has the same DNA sequence at the same location
e) the condition when a pair of chromosomes has different DNA sequences at the same location

36. Which describes gene flow?
a) any change in gene or allele frequencies in a population
b) the change in allele frequencies caused by emigration and immigration
c) a rapid population decrease
d) the establishment of a population in a new region
e) can reduce differences between populations caused by genetic drift

37. Macroevolution is defined as which of the following?
a) the evolution of organisms with tissues into organisms with organs
b) the change in the characteristics that are most common in the population
c) the formation of a new species from a common ancestor
d) adaptations to the environment
e) a series of random mutations in the population

47. The characteristic that best helps define an organism as a member of a particular species is which of the following?
a) It looks like other organisms.
b) It can successfully breed with similar organisms.
c) It lives in the same region as similar organisms.
d) It eats the same food as similar organisms.
e) It has the same day/night sleeping pattern as similar organisms.

48. Bacteriophages are
a) bacteria that prey upon viruses
b) bacteria that are photosynthetic
c) viruses that prey upon bacteria
d) bacteria that can live without oxygen

49. The four stages of viral replication in order are:
a) attachment, synthesis, assembly, release
b) interphase, prophase, metaphase, anaphase
c) virulent, temperate, telophase, lysis
d) deletion, duplication, translocation, succession

True or False (10 marks)

	Statement	T or F
1.	Bacteria do not contain a true nucleus	T or F
2.	The basic structure of the haemoglobin molecule is the same in humans, penguins, and salmon. This is considered to be an example of homology.	T or F
3.	There are a great variety of breeds of dogs. This is considered to be an example of natural selection.	T or F
4.	In the early stages of pregnancy, the human embryo has a tail. This is considered to be an example of vestigial structures	T or F
5.	Macronutrients are elements that the plant needs in large amounts.	T or F
6.	Microevolution can be a series of random mutations in the population	T or F
7.	Selection can reduce differences between populations caused by genetic drift	T or F
8.	Meiosis only occurs in the sex cells.	T or F
9.	A karyotype is a chart illustrating the different types of blood.	T or F
10.	Haemophilia is an example of codominance.	T or F

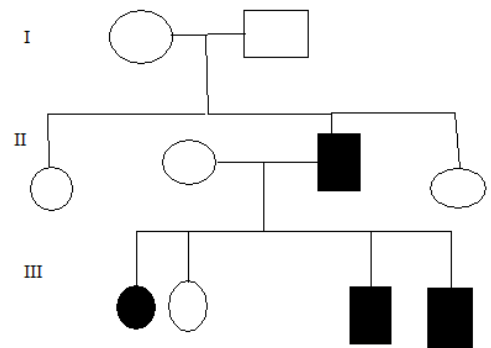
Short Answer (38 marks)

- Based on the information in the table: (4 marks)
 - Which of the animals are the most closely related to the short-tail weasel? Explain your reasoning.
 - The mink and the muskrat are not in the same family. Suggest reasons to why this is?

Common Name	Scientific Name	Family
red squirrel	<i>Tamiasciurus hudsonicus</i>	Sciuridae
short-tail weasel	<i>Mustela erminea</i>	Mustelidae
groundhog	<i>Marmota monax</i>	Sciuridae
mink	<i>Mustela vison</i>	Mustelidae
eastern chipmunk	<i>Tamias striatus</i>	Sciuridae
river otter	<i>Lutra canadensis</i>	Mustelidae
fisher	<i>Martes pennanti</i>	Mustelidae
muskrat	<i>Ondatra zibethica</i>	Cricetidae
black-footed ferret	<i>Mustela nigripes</i>	Mustelidae

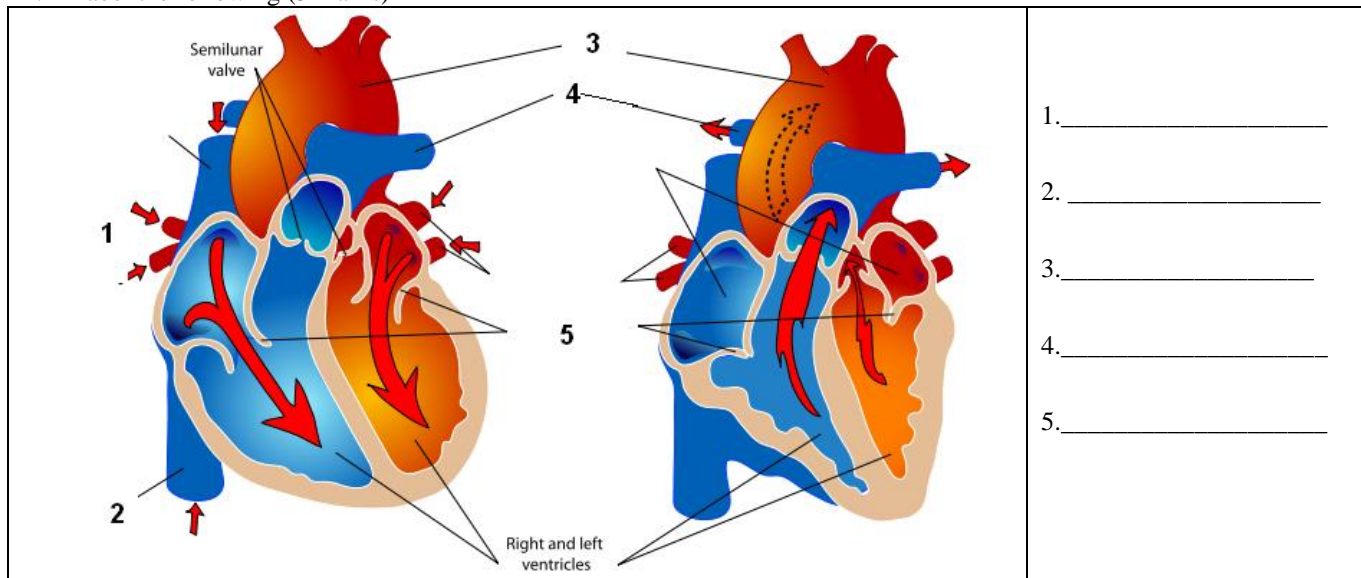
Order -- Perciformes _____
 Class -- Actinopterygii _____
 Kingdom -- Animalia _____
 Phylum -- Chordata _____
 Species -- tridigitatus _____
 Family -- Dactyloscopidae _____
 Genus -- Dactyloscopus _____

- The above shows the classification of a species of fish. Use # 2 a) to write its scientific name.
- Explain the term genetic drift. How is genetic drift significant to natural selection? Use an example. (3 marks)
 - Explain what is meant by convergent evolution and divergent evolution. Give examples. (4 marks)
 - What would be the possible blood types of offspring from the following parents? (8 marks)
 - hybrid A X hybrid B
 - hybrid A x type O
 - pure A x pure B
 - type AB x type AB
 - What is the difference between systolic and diastolic blood pressure? Why is the pressure higher in the arteries than in the capillaries and veins? (3 marks)
 - Explain the major differences between the kingdoms of Eubacteria, Archaeobacteria and Protista in terms of their cell structure and their habitat. (6 marks)
 - Explain the main function of the stomach and the duodenum. What other functions occur at these sites? (4 marks)
 - Hemophilia is a sex-linked recessive disorder caused by the allele **h**. Use the information from the pedigree to answer the following questions. (4 marks)
 - Indicate the genotypes of the parents I 1 and I 2.
 - Indicate the genotypes of II 3 and III 1.
 - If the parents were to have another son determine the probability the child would be hemophiliac.

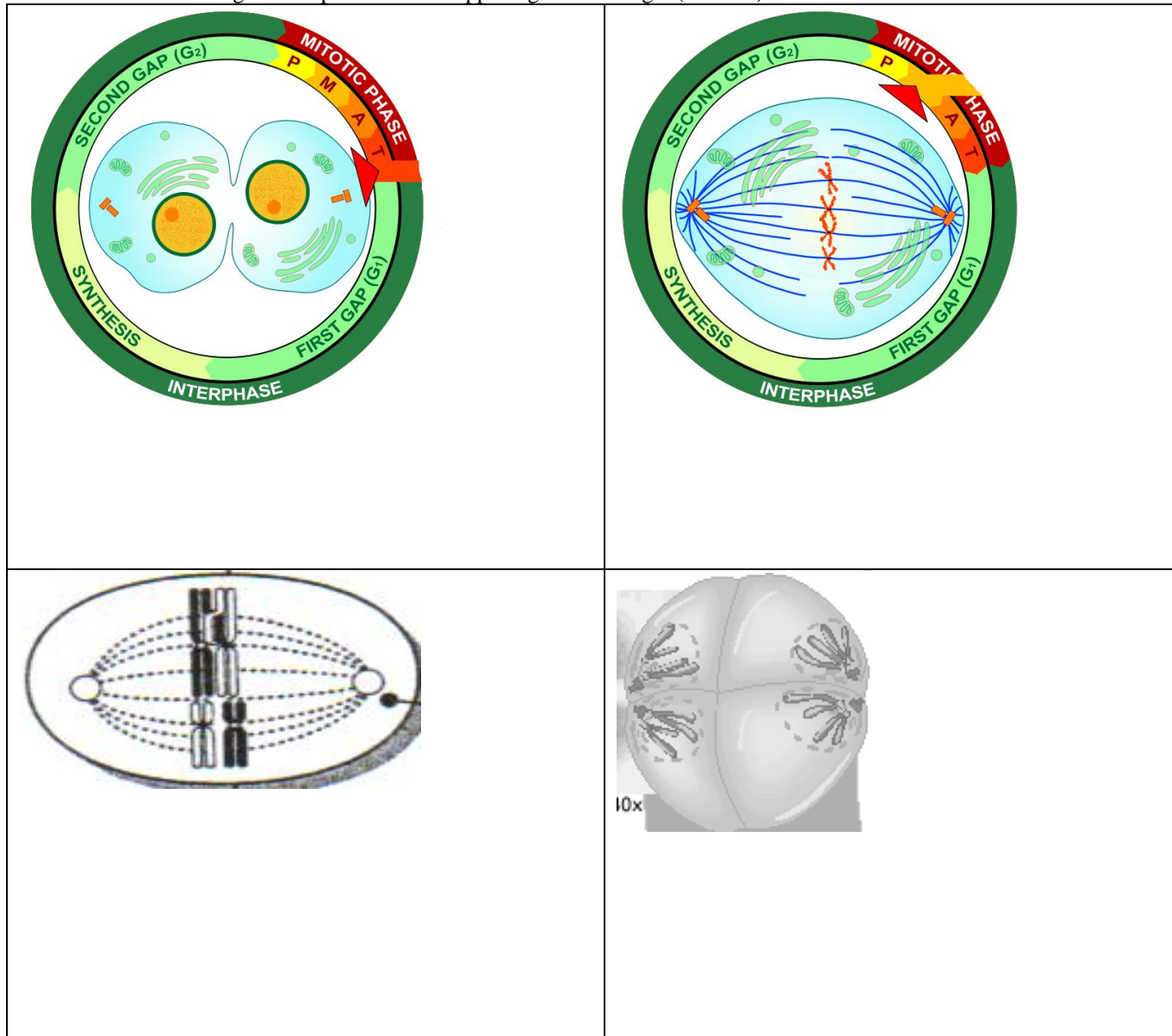


Diagrams (22 marks)

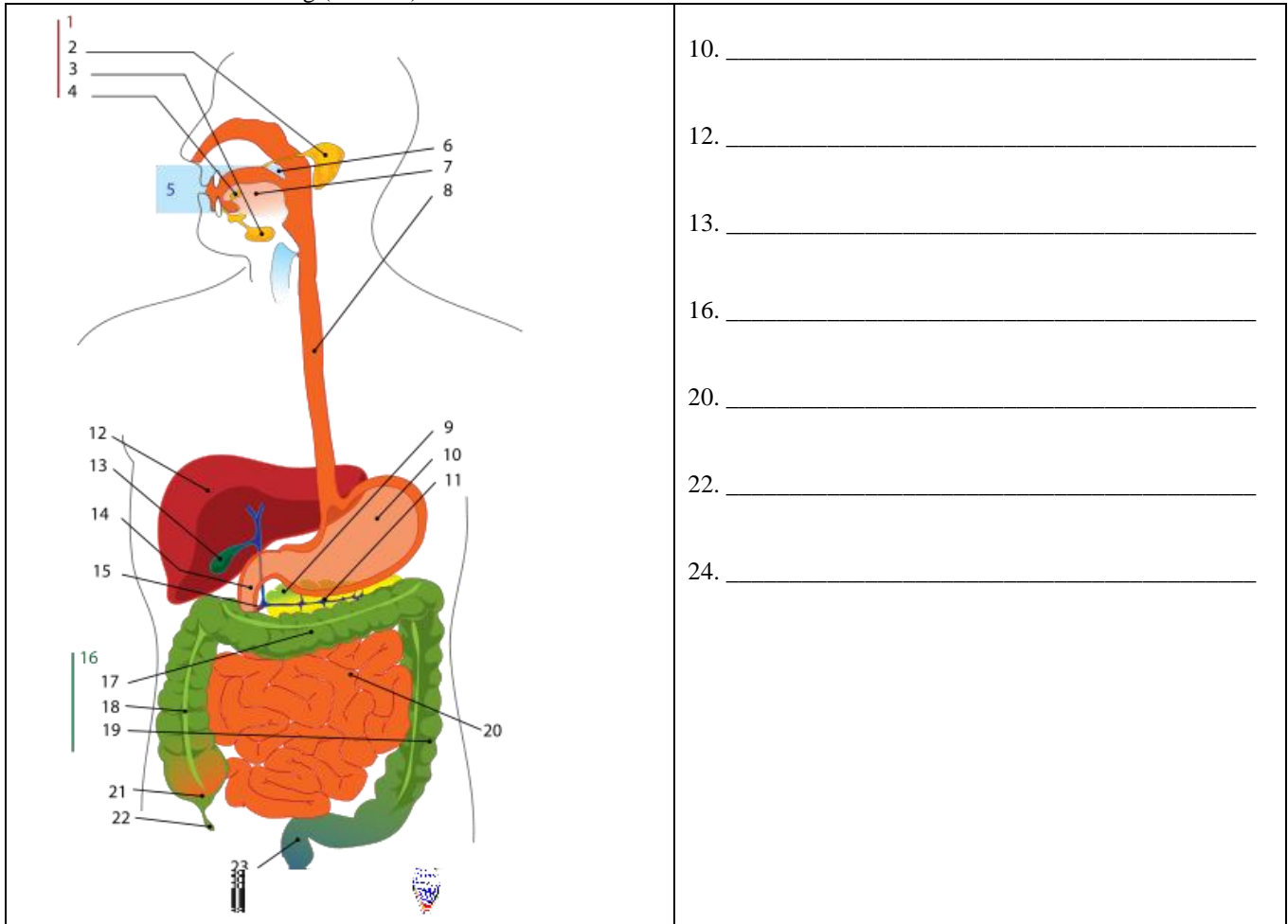
1. Label the following (5 marks)



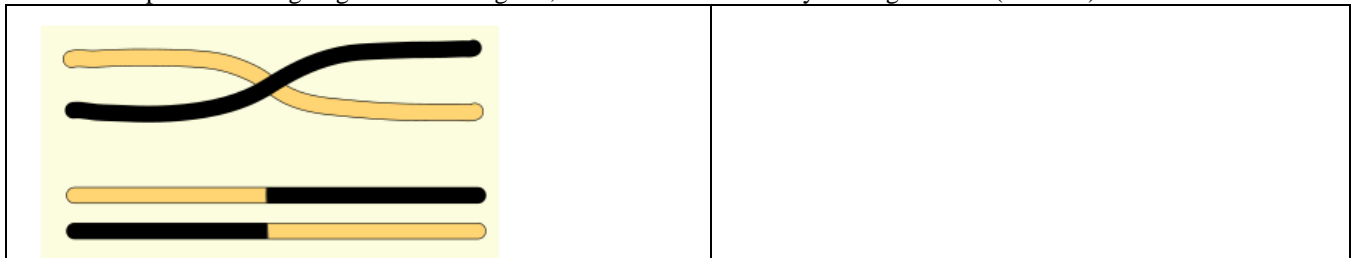
2. Label each stage and explain what is happening in each stage. (4 marks)



3. Label the following (7 marks)



4. Explain what is going on in this diagram, when it occurs and why it is significant. (3 marks)



5. Label the following diagram (3 marks):

