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Faculty of Medicine, Masaryk University, Brno
BIOLOGY Admission Exam

1.Part of the hip bone is:
a) ilium b) femur c) last lumbar vertebra d) sphenoid sinus e) none of the answers is correct

2. Bones are held together at joints by:
a) cartilage b) osteons c) ligaments d) tendons e) none of the answers is correct

3. The longest muscle of human body is:
a) the sartorius b) the triceps c) the biceps d) the long cervical e) none of the answers is correct

4. Which of the following nerve belongs to the basic cranial nerves (CN I to CN XII)?
a) median nerve b) sciatic nerve c) vagus nerve d) pudendal nerve e) none of the answers is correct

5. Haemostasis is:
a) the formation of blood cellular components
b) the tendency of a system to maintain its internal stability
c) the method of treating disease by drugs, given in minute doses, that would produce in a healthy person symptoms similar to those of the disease
d) a process which causes bleeding to stop
e) none of the answers is correct

6. In 1 mm3 of human blood there are:
a) 5.106 leukocytes b) 5.109 erythrocytes c) 5.106 lymphocytes d) 5.105 erythrocytes e) none of the answers is correct

7. Which of the following foodstuffs begins to be digested in the mouth?
a) ham b) cheese c) bread d) milk e) none of the answers is correct

8. Which of the following is the correct order for the movement of air to the lungs?
a) nose, larynx, pharynx, trachea, bronchi
b) nose, pharynx, larynx, trachea, bronchi
c) nose, pharynx, larynx, bronchi, trachea
d) nose, bronchi, larynx, bronchi, trachea
e) none of the answers is correct

9. The female gonads are called:
a) the vagina b) the uterus c) the ovaries d) the fallopian tube e) none of the answers is correct

10. The main function of the kidney is to:

a) metabolise vitamins

b) eliminate oxygen

c) regulate fluid balance

d) eliminate carbon dioxide

e) none of the answers is correct

11. The complete temporary dentition consists of:

a) 20 teeth b) 32 teeth c) 64 teeth d) 52 teeth e) none of the answers is correct

12. In the following three columns, hormone, endocrine organ and its functions are listed. Which of the triads has a meaning?

a) thyroxine parathyroid gland brain maturation

b) testosteron testes growth of muscle mass

c) insulin pancreas bone mineralization

d) growth hormone hypothalamus protein synthesis

e) none of the triads is meaningful

13. Most oxygen in the blood is transported:

a) inside the red blood cells bound to haemoglobin molecules

b) transported in the plasma bound to haemoglobin molecules

c) inside the red blood cells bound to cytoskeletal proteins

d) transported in the plasma as bicarbonate ions

e) none of the answers is correct

14. Which scientist´s work contributed to our understanding of the causes of infectious diseases?

a) Alexander Fleming

b) James Watson

c) Louis Pasteur

d) Robert Koch

e) none of the answers is correct

15. Twenty nine (29%) of the nucleotide bases in E. coli DNA are cytosines (C). What is the percentage of adenine (A) bases in this E.coli DNA?

a) 58% b) 21% c) 29% d) 42% e) none of the answers is correct

16. Which of the following descriptions best fits the class of molecules known as nucleotides?
a) a nitrogenous base and a phosphate group

b) a nitrogenous base and a pentose sugar

c) a nitrogenous base, a phosphate group and a pentose sugar

d) a phosphate group and an adenine or uracil

e) none of the answers is correct

17. Which of the following are nitrogenous bases of the purine type?

a) cytosine and guanine

b) guanine and adenine

c) adenine and thymine

d) thymine and uracil

e) none of the answers is correct

18. Which of the following IS NOT part of a virus?

a) capsid b) ribosomes c) nucleic acid d) envelope e) none of the answers is correct

19. Eukaryotic cells differ from prokaryotic cells in that:

a) Eukaryotic cells are usually smaller than prokaryotic cells.

b) Eukaryotic cells may possess a cell wall and prokaryotic cells lack cell wall.

c) Eukaryotic cells possess cytoskeleton and prokaryotic cells do not.

d) Prokaryotes have RNA, eukaryotes have DNA.

e) none of the answers is correct

20. Which of the following contains its own DNA and ribosomes?

a) mitochondrion b) vacuole c)lysosome d) Golgi apparatus e) none of the answers is correct

21. The cytoskeleton includes:

a) microtubules made of actin filaments

b) microfilaments made of tubulin

c) intermediate filaments made of twisted fibers of vimentin or keratin

d) smooth endoplasmic reticulum

e) none of the answers is correct

22. In the following three columns, cell constituents, biochemical components and biochemical functions are listed. Which of the triads has a meaning?

a) cytoplasm uracil synthesis of proteins

b) nucleus deoxyribose synthesis of mRNA 3

c) mitochondria phosphate ATP synthesis

d) vacuole glycogen glucose oxidation

e) none of the triads is meaningful

23. The main function of plasma membrane is to:

a) maintain the cell shape and size

b) control of all cellular activity

c) store cell material

d) regulate the flow of materials into and outside the cell

e) none of the answers is correct

24. Which of the following IS NOT membrane bounded cell organelle?

a) nucleus b) mitochondria c) ribosomes d) chloroplasts e) none of the answers is correct

25. Which enzyme catalyzes the elongation of a DNA strand in the 5′ → 3′ direction?

a) primase b) DNA polymerase c) DNA ligase d) topoisomerase e) none of the answers is correct

26. The ″restriction point″ occurs at which phase of the cell cycle?

a) G0 b) G1 c) S d) G2 e) none of the answers is correct

27. If the DNA content of a diploid cell in the G1 phase of the cell cycle is x, then the DNA content of the same cell at metaphase of meiosis I would be:

a) 4x b) 0.5x c) x d) 2x e) none of the answers is correct

28. Human liver cells and kidney cells each contain:

a) different genes from one another, because some of the proteins made differ between the two cell types.

b) the same genes, because in a single multicellular organism, all somatic cells (nongerm cells) contain the same genes.

c) a set of proteins, all of which are produced in both cell types.

d) a single, circular chromosome.

e) none of the answers is correct

29. In meiosis, the sister chromatids separate from one another during:

a) metaphase I

b) metaphase II

c) anaphase I

d) anaphase II

e) none of the answers is correct

30. Okazaki fragments are:

a) parts of DNA carrying coding seqences

b) parts of newly synthesised leading strand of DNA

c) parts of newly synthesised lagging strand of DNA

d) parts of DNA carrying non-coding seqences e) none of the answers is correct

31. An organism that has an identical pair of alleles for a trait is called:

a) homozygous b) heterozygous c) monozygous d) dizygous e) none of the answers is correct

32. To produce two genetically identical daughter cells, the DNA in each chromosome must be replicated, and the replicated chromosomes must be accurately distributed into the two daughter cells. The DNA is replicated in ------ and the replicated chromosomes segregate in ------.

a) S and anaphase of M phase

b) S phase and metaphase of M phase

c) G1 and metaphase of M phase

d) G1 and G2 phase

e) none of the answers is correct 4

33. The F1 offspring of Mendel′s classic pea cross always looked like one of the two parental varieties because:

a) each allele affected phenotypic expression

b) one phenotype was completely dominant over another

c) the traits blended together during fertilization

d) no genes interacted to produce the parental phenotype

e) none of the answers is correct

34. What is the source of the extra chromosome 21 in an individual with Down syndrome?

a) nondisjunction in the mother only

b) nondisjunction in the father only

c) duplication in either parent

d) nondisjunction or translocation in either parent

e) none of the answers is correct

35. At which stage of mitosis are chromosomes usually photographed in the preparation of a karyotype?

a) prophase b) metaphase c) anaphase d) telophase e) none of the answers is correct

36. A Barr body is a(n):

a) nucleolus b) inactivated X chromosome c) Y chromosome visible in interphase cell d) central body appearing during cytokinesis of animal cell e) none of the answers is correct

37. What are the possible parental genotypes of an individual who is homozygous recessive?
a) homozygous dominant

b) homozygous recessive

c) heterozygous

d) both b and c

e) none of the answers is correct

38. In pea plants, the dominant allele (P) codes for purple flowers and the recessive allele (p) codes for white flowers. What is the probability that a cross between a homozygous dominant (PP) plant and a heterozygous plant (Pp) will result in offspring that have purple flowers?

a) 100% b) 75% c) 25% d) 0% e) none of the answers is correct

39. The A and B alleles in human blood type follow what type of allele interaction?

a) complete dominance

b) codominance

c) incomplete dominance

d) none of the above

40. All animal organisms inhabiting a particular region constitute: a) biocoenosis b) phytocoenosis c) zoocoenosis d) ecosystem e) none of the answers is correct