

Name of applicant: .....

**1. Which of the following bones doesn't take part on the formation of the orbit?**

- a) upper jaw (maxilla)    b) ethmoid bone    c) lacrimal bone    d) zygomatic bone    e) all of them are part of the orbit

**2. Where is the majority of water reabsorbed?**

- a) proximal tubule of nephron    b) renal pelvis    c) ureter    d) urinary bladder    e) none of the answers is correct

**3. The maximum volume of air that can be moved in and out during a single breath is called:**

- a) tidal volume    b) residual volume    c) vital capacity    d) functional residual capacity  
e) none of the answers is correct

**4. The thin filaments of a muscle fibre are made up of:**

- a) myosin    b) actin    c) tubulin    d) kinesin    e) none of the answers is correct

**5. Which of the following belongs to the tertiary hair?**

- a) lanugo    b) tragi    c) eyelashes    d) eyebrows    e) none of the answers is correct

**6. The structure of the neuron that conducts impulses from the cell body is:**

- a) dendrite    b) axon    c) neurofilament    d) myofilament    e) none of the answers is correct

**7. The outer-to-inner sequence of tissue layers in a post-gastrulation vertebrate embryo is:**

- a) endoderm → ectoderm → mesoderm    b) mesoderm → endoderm → ectoderm  
c) ectoderm → mesoderm → endoderm    d) ectoderm → endoderm → mesoderm  
e) none of the answers is correct

**8. Select the most correct statement.**

- a) The duct that transports the sperm into the urethra is ureter.  
b) Sperms are produced in the germinal epithelium of the seminiferous tubules of the epididymis.  
c) The formation of a sperm is known as spermatogenesis.  
d) The inability to achieve an erection is known as ejaculation.  
e) none of the answers is correct

**9. Which of these associations is mismatched?**

- a) right ventricle – pulmonary trunk    b) left ventricle – aorta  
c) inferior vena cava – right atrium    d) superior vena cava – right atrium    e) all answers are correct

**10. Which of the following vitamins are recommended to be taken with fats?**

- a) vitamin A and D    b) vitamin B1 and C    c) vitamin B12 and E    d) vitamin C and K  
e) none of the answers is correct

**11. Select the statement that most correctly describes function of hormones secreted by the pancreas.**

- a) blood circulation    b) muscular coordination    c) glucose regulation  
d) ovulation    e) none of the answers is correct

**12. Select the statement that most correctly describes immunity.**

- a) All immune system responses are specific.  
b) Mucus made by the respiratory system is one kind of immune system defence.  
c) Cilia move pathogens into the bloodstream.  
d) The main function of red blood cells is to make antibodies.    e) none of the answers is correct

**13. Which of the following organs and their main functions are correctly paired?**

- a) liver: synthesis of insulin    b) gallbladder: bile storage    c) kidney: secretion of cortisol  
d) pancreas: secretion of HCl    e) none of the answers is correct

**14. Select the most probable statement.**

- a) Transformation is referred to as the bacterial equivalent of sexual reproduction.
- b) F plasmids are usually integrated into the bacterial genome.
- c) Conjugation is referred to as the bacterial equivalent of sexual process.
- d) Bacteria are multiplied by mitosis.
- e) none of the answers is probable

**15. Select the statement that most correctly describes the differences between prokaryotic and eukaryotic cells.**

- a) Both prokaryotic and eukaryotic cells are capable of binary fission.
- b) Specialization is common in both prokaryotic and eukaryotic cells.
- c) A 50- $\mu\text{m}$  cell is likely to be eukaryotic.
- d) Bacterial cells can exist as independent unicellular organisms or part of multicellular organisms.
- e) none of the answers is correct

**16. Which of the following is present in a prokaryotic cell?**

- a) kinocilium
- b) ribosome
- c) nuclear envelope
- d) spindle
- e) all above mentioned structures are present in prokaryotic cell

**17. A cell has the following molecules and structures: enzymes, DNA, ribosomes, plasma membrane and mitochondria. It could be following cell:**

- a) a bacterium
- b) an animal, but not a plant cell
- c) a plant, but not an animal
- d) a plant or an animal
- e) all of above mentioned cells

**18. The process of capturing a substance or particle from outside the cell by engulfing it with the cell membrane is:**

- a) osmosis
- b) endocytosis
- c) facilitated diffusion
- d) exocytosis
- e) none of the answers is correct

**19. Select the most correct answer. The site of ribosomal subunit assembly is:**

- a) nucleolus
- b) Golgi apparatus
- c) chloroplast
- d) nucleus
- e) none of the answers is correct

**20. Select the statement that most correctly describes the nucleus of a eukaryotic cell.**

- a) Is bound by a single membrane which is, at points, continuous with the endoplasmic reticulum.
- b) The main role of nucleoli is the assembly of Golgi bodies.
- c) RNA passively passes from the nucleus to the cytoplasm.
- d) Nucleoli are dense staining areas and one or more of them can be present.
- e) none of the answers is correct

**21. Which of the following show 9 + 0 arrangement of microtubular triplets?**

- a) centrioles and cilia
- b) centrioles and basal bodies
- c) cilia and flagella
- d) basal bodies and flagella
- e) none of the answers is correct

**22. Select the statement that most correctly describes cellular microfilaments.**

- a) Kinesin proteins move groups of similarly orientated actin filaments over each other.
- b) Actin mediates fibroblast movement via rearrangement of its filaments.
- c) Have a diameter of around 25 nm.
- d) The polymerization of globular G actin subunits cannot be influenced by extracellular signals.
- e) none of the answers is correct

**23. Select the statement that best describes the DNA replication fork.**

- a) The leading strand can be synthesized in a continuous process from a single RNA primer.
- b) Three replication complexes form at each origin of replication and proceed in opposite directions.
- c) Replication is initiated by Okazaki fragments giving rise to two replication forks.
- d) Nucleotides can only be added to the 5' end of the replication fork.
- e) none of the answers is correct

**24. The leading and the lagging DNA strands differ in that:**

- a) the leading strand is synthesized at twice the rate of the lagging strand
- b) the leading strand is synthesized by adding nucleotides to the 3' end of the growing strand, and the lagging strand is synthesized by adding nucleotides to the 5' end

- c) the lagging strand is synthesized continuously, whereas the leading strand is synthesized in short fragments that are ultimately stitched together
- d) the leading strand is synthesized in the same direction as the movement of the replication fork, and the lagging strand is synthesized in the opposite direction
- e) none of the answers is correct

**25. Picture shows chromosomes in eucaryotic cell. Recognise and name the phases of the cell cycle:**



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

**26. In sickle-cell disease, a single substitution of an 'A' by 'T' on the  $\beta$ -globin gene causes the resultant protein to have altered properties, but to be of normal size. Select the term that most accurately describes this type of mutation.**

- a) silent mutation
- b) missense mutation
- c) nonsense mutation
- d) frameshift mutation
- e) none of the answers is correct

**27. Select the statement that most correctly describes the genetic code.**

- a) There are 64 amino-acid coding codons.
- b) The tRNA anticodons bind one specific base.
- c) There is one codon encoding each amino acid.
- d) There are 61 amino-acid coding codons.
- e) none of the answers is correct

**28. Alternate forms of a gene having the same position on a pair of chromosomes and affecting the same trait are called:**

- a) chromatids
- b) alleles
- c) DNA segments
- d) centrioles
- e) none of the answers is correct

**29. In which of the following would you usually find telomeres?**

- a) human mitochondrial DNA
- b) human chromosomes
- c) bacterial chromosomes
- d) the influenza virus genome
- e) all previously mentioned structures contain telomeres

**30. Gene transcription takes place in:**

- a) lysosomes and peroxisomes
- b) mitochondria and nucleus
- c) ribosomes and centrioles
- d) smooth endoplasmic reticulum
- e) none of the answers is correct

**31. Select the statement that most correctly describes the process of mitosis.**

- a) Chromosomes move towards each pole during telophase.
- b) Contractile ring is formed during anaphase.
- c) Kinetochores are formed during telophase.
- d) Chromosomes are maximally condensed at the end of metaphase.
- e) none of the answers is correct

**32. Select the statement that most correctly describes meiosis.**

- a) During the prophase I crossing over takes place.
- b) During anaphase I the chromatids separate and migrate to opposite poles of the spindle.
- c) Telophase I results in the formation of two genetically identical haploid cells.
- d) During the second division, the chromatids separate in metaphase II.
- e) none of the answers is correct

**33. Diploid cell has 18 chromosomes. If a pair of homologous chromosomes fails to separate during anaphase of meiosis II, what will be the chromosome number of the four resulting gametes?**

- a) 10; 10; 9; 9
- b) 10; 10; 8; 8
- c) 10; 8; 9; 9
- d) 10; 10; 8; 9
- e) none of the answers is correct

**34. An achondroplastic dwarf man with normal vision marries a colour-blind woman of normal height. The man's father was 6 feet tall, and both woman's parents were of average height. Achondroplastic dwarfism is autosomal dominant, blindness is X-linked recessive. What proportion of their male children would be colour-blind and normal height?**

- a) all                      b) none                      c) 1/4                      d) 1/2                      e) none of the answers is correct

**35. Identical twins usually results from fertilisation of:**

- a) two eggs by one sperm                      b) one egg by two sperms                      c) one egg by one sperm  
d) two eggs by two sperms                      e) none of the answers is correct

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

- a) one phenotype was completely dominant over another                      b) each allele affected phenotypic expression  
c) the traits blended together during fertilization                      d) no genes interacted to produce the parental phenotype  
e) none of the answers is correct

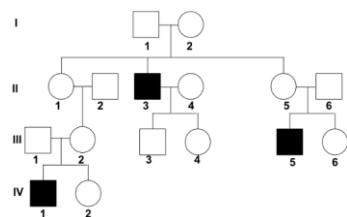
**37. All offspring of a white hen and a black rooster are gray. The simplest explanation of this pattern of inheritance is:**

- a) pleiotropy                      b) sex linkage                      c) incomplete dominance                      d) codominance  
e) none of the answers is correct

**38. In cats, black colour is caused by an X-linked allele; the other allele at this locus causes orange colour. The heterozygote is tortoise-shell. What kinds of offspring would you expect from the cross of black female and orange male?**

- a) tortoise-shell female; tortoise-shell male                      b) black female; orange male                      c) tortoise-shell female; black male  
d) orange female; black male                      e) none of the answers is correct

**39. Inheritance of what genetic disorder does most probably show the pedigree chart given bellow?**



- a) X-linked recessive                      b) of X-linked dominant                      c) autosomal recessive                      d) autosomal dominant  
e) none of the answers is correct

**40. Mutations will typically ---- the genetic diversity in a population.**

- a) increase                      b) decrease                      c) maintain                      d) it is dependent on type of mutation                      e) none of the answers is correct