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1. Which structures perform the function of mitochondria in bacteria ?

(A) Nucleoid (B) Ribosomes (C) Cell Wall (D) Mesosomes

2. Isogamous condition with non-flagellated gametes is found in

(A) Volvox (B) Fucus (C) Chlamydomonas (D) Spirogyra

3. Which one of the following is heterosporous ?

(A) Adiantum (B) Equisetum (C) Dryopteris (D) Salvinia

4. Which one of the following pairs of animals are similar to each other pertaining to the features stated against them ?

(A) Pteroopus and Ornithorhynchus - Viviparity (B) Garden lizard and crocodile - Three chambered heart (C) Ascaris and Ancylostoma - Metameric segmentation (D) Sea horse and flying fish - Cold blooded (poikilothermal).

5. Lenticels are involved in

(A) Food transport (B) Photosynthesis (C) Transpiration (D) Gaseous exchange

6.. Which of the following statements is not true for stomatal apparatus ?

(A) Guard cells invariably posses chloroplasts and mitochondria (B) guard cells are always surrounded by subsidiary cells (C) Stomata are involved in gaseous exchange. (D) Inner wall of guard cells are thick.

7. The ciliated columnar epithelial cells in humans are known to occur in

(A) Eustachian tube and stomach lining (B) bronchioles and Fallopian tube (C) bile duct and oesophagus (D) Fallopian tube and urethra

8. Chemiosmotic theory of ATP synthesis in the chloroplasts and mitochondria is based on

(A) Membrane potential (B) Accumulation of Na ions (C) Accumulation of K ions (D) Proton gradient

9. The main organelle involved in modification and outing of newly synthesized proteins to their destinations is

(A) chloroplast (B) mitochondria (C) lysosomes (D) endoplasmic reticulum

10. Which one of the following is a non-reducing carbohydrate ?

(A) Maltose (B) Sucrose (C) Lactose (D) Ribose 5-phosphate

11. Which of the following statements about enzymes is wrong ?

(A) Enzymes are denatured at high temperatures (B) Enzymes are mostly proteins but some are lipids also (C) Enzymes are highly specific (D) Enzymes require optimum pH and temperature for maximum activity.

12. During meiosis I, the chromosomes start pairing at

(A) zygotene (B) pachytene (C) diplotene (D) leptotene

13. Identify the meiotic stage in which the homologous chromosomes separate while the sister chromatids remain associated at their centromeres.

(A) Metaphase I (B) Metaphase II (C) Anaphase I (D) Anaphase II

14. Which of the following criteria does not pertain to facilitated transport ?

(A) Transport saturation (B) Uphill transport (C) Requirement of special membrane proteins (D) High selectivity

15. Guttation is the result of

(A) diffusion (B) transpiration (C) osmosis (D) root pressure

16. Guard cells help in

(A) transpiration (B) guttation (C) fighting against infection (D) protection against grazing

17. Deficiency symptoms of nitrogen and potassium are visible first in

(A) senescent leaves (B) young leaves (C) roots (D) buds

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18. Specialized cells for fixing atmospheric nitrogen in Nostoc are (A) heterocysts (B) hormogonia (C) nodules (D) akinetes

19. Which two distinct microbial processes are responsible for the release of fixed nitrogen as dinitrogen gas (N2) to the atmosphere ? (A) Aerobic nitrate oxidation and nitrite reduction (B) Decomposition of organic nitrogen and conversion of dinitrogen to ammonium compounds (C) Enteric fermentation in cattle and nitrogen fixation by Rhizobium in root nodules of legumes (D) Anaerobic ammonium oxidation and denitrification

20. For its action, nitrogenase requires (A) high input of energy (B) light (C) Mn2+ (D) super oxygen radicals

21. Read the following four statements (A – D). (a) Both photophosphorylation and oxidative phosphorylation involve uphill transport of protons across the membrane (b) In dicot stems, a new cambium originates from cells of pericycle at the time of secondary growth (c) Stamens in flowers of Gloriosa and Petunia are polyandrous. (d) Symbiotic nitrogen fixers occur in free-living state also in soil How many of the above statements are right ? (A) Two (B) Three (C) Four (D) One

22. Which one of the following is essential for photolysis of water ? (A) manganese (B) zinc (C) copper (D) boron

23. In which one of the following processes CO2 is not released ? (A) Aerobic respiration in plants (B) Aerobic respiration in animals (C) Alcoholic fermentation (D) Lactate fermentation

24. Which of the metabolites is common to carbohydrates-mediated breakdown of fats, carbohydrates and proteins ? (A) Pyruvic acid (B) Acetyl CoA (C) Glucose - 6 - phosphate (D) Fructose 1, 6 - bisphosphate

25. In mitochondria protons accumulate in the (A) Outer membrane (B) Inner membrane (C) intermembrane space (D) matrix

26. The energy-releasing metabolic process in which substrate is oxidized without an external electron acceptor is called (A) glycolysis (B) fermentation (C) aerobic respiration (D) photorespiration

27. Fructose is absorbed into the blood through mucosa cells of intestine by the process called (A) active transport (B) facilitated transport (C) simple diffusion (D) co-transport mechanism

28. Select the correct match of the digested products in humans given in column I with their absorption site and mechanism in column II. Column I Column II (A) Glycerol, fatty acids Duodenum, move as chylomicrons (B) Cholesterol, maltose Large intestine, active absorption (C) Glycine, glucose Small intestine, active absorption (D) Fructose, Na+ Small intestine, passive absorption

29. Which enzymes are likely to act on the baked potatoes eaten by a man, starting from the mouth and as it moves down the alimentary canal ? (A) Pancreatic amylase Salivary amylase Lipases (B) Disaccharidase like maltase Lipases Nucleases (C) Salivary amylase Pancreatic amylates Disaccharidases (D) Salivary maltase Carboxy peptidase Trypsinogen

30. Anxiety and eating spicy food together in an otherwise normal human, may lead to (A) indigestion (B) jaundice (C) diarrhoea (D) vomiting

31. Where do certain symbiotic microorganisms normally occur in human body ? (A) Caecum (B) Oral lining and tongue surface (C) Vermiform appendix and rectum (D) Duodenum

32. During prolonged fastings, in what sequence are the following organic compounds used up by the body ? (A) First carbohydrates, next fats and lastly proteins (B) first fats, next carbohydrates and lastly proteins (C) first carbohydrates, next proteins and lastly lipids (D) first proteins, next lipids and lastly carbohydrates

33. Which of the following carries glucose from digestive tract to liver ? (A) pulmonary vein (B) hepatic artery (C) hepatic portal vein (D) none of these

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34. Approximately seventy percent of carbon-dioxide absorbed by the blood will be transported to the lungs (A) as bicarbonate ions (B) in the form of dissolved gas molecules (C) by binding to R.B.C (D) as carbamino - haemoglobin

35. Which one of the following is the correct statement for respiration in humans ? (A) Cigarette smoking may lead to inflammation of bronchi (B) Neural signals from pneumotaxic centre in pons region of brain can increase the duration of inspiration (C) Workers in grinding and stone-breaking industries may suffer, from lung fibrosis (D) About 90% of carbon dioxide (CO_2) is carried by haemoglobin as carbamino-haemoglobin

36. People who have migrated from the planes to an area adjoining Rohtang Pass about six months back (A) have more RBCs and their haemoglobin has a lower binding affinity to O_2 (B) are not physically fit to play games like football (C) suffer from altitude sickness with symptoms like nausea, fatigue, etc (D) have the usual RBC count but their haemoglobin has very high binding affinity to O_2.

37. A certain road accident patient with unknown blood group needs immediate blood transfusion. His one doctor friend at once offers his blood. What was the blood group of the donor ? (A) Blood group B (B) Blood group AB (C) Blood group O (D) Blood group A

38. Bundle of His' is a part of which one of the following organs in humans ? (A) Brain (B) Heart (C) Kidney (D) Pancrease

39. Which one of the following statements is correct regarding blood pressure ? (A) 139/90 mm Hg is considered high and requires treatment (B) 100/55 mm Hg is considered an ideal blood pressure (C) 105/50 mm Hg makes one very active (D) 190/110 mm Hg may harm vital organs likes brain and kidney

40. If due to some injury the chordae tendinae of the tricuspid valve of the human heart is partially non-functional, what will be the immediate effect ? (A) The flow of blood into the aorta will be slowed down (B) The 'pacemaker' will stop working (C) The blood will tend to flow back into the left atrium (D) The flow of blood into the pulmonary artery will be reduced

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41. Fastest distribution of some injectable material/medicine and with no risk of any kind can be achieved by injecting it into the (A) muscles (B) arteries (C) veins (D) lymph vessels

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42. Compared to blood our lymph has (A) plasmas without proteins (B) more WBCs and no RBCs (C) more RBCs and less WBCs (D) no plasma

43. Which of the following causes an increase in sodium reabsorption in the distal convoluted tubule ? (A) Increase in aldosterone levels (B) Increase in antidiuretic hormone levels (C) Decrease in aldosterone levels (D) Decrease in antidiuretic hormone levels

44. Select the option which shows correct matching of animal with its excretory organ and excretory product. Animal organs Excretory Excretory product (a) Labeo (Rohu) Nephridial tubes Ammonia (b) Salamander Kidneys Urea (c) Peacock Kidneys Urea (d) Housefly Renal tubules Uric acid

45. A fall in glomerular filtration rate (GFR) activates (A) juxtaglomerular cells to release renin (B) adrenal cortex to release aldosterone (C) adrenal medulla to release adrenaline (D) posterior pituitary to release vasopressin

46. Select the correct matching of the type of the joint with the example in human skeletal system Type of joint Example (a) Cartilaginous joint - between frontal and parietal (b) Pivot joint - between third and fourth cervical vertebrae (c) Hinge joint - between humerus and pectoral girdle (d) Gliding joint - between carpals

47. Simulation of a muscle fiber by a motor neuron occurs at (A) the neuromuscular junction (B) the transverse tubules (C) the myofibril (D) the sacroplasmic reticulum

48. The H-zone in the skeletal muscle fibre is due to (A) the central gap between actin filaments extending through myosin filaments in the A-band (B) extension of myosin in the central portion of the A-band (C) the absence of myofibrils in the central portion of A-band (D) the central gap between myosin filaments in the A-band

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49. The characteristic and an example of a synovial joint in humans is Characteristics Examples (a) Fluid filled synovial Joint between atlas and axis cavity between two bones (b) Lymph filled between two bones, Gliding joint between carpals limited movement (c) Fluid cartilage between two bones, Knee joint limited movement (d) Fluid filled between two joints, Skull bones provides cushion

50. During muscle contraction in humans, the (A) sarcomere does not shorten (B) A band remains same (C) A, H and I bands shorten (D) actin filaments shorten

51. Injury localized to the hypothalamus would most likely disrupt (A) short - term memory (B) co-ordination during locomotion (C) executive functions, such as decision making (D) regulation of body temperature

52. Which one of the following statements is not correct ? (A) Retinal is the light absorbing portion of visual photo pigments (B) In retina the rods have the photopigment rhodopsin while cones have three different photopigments (C) Retinal is a derivative of vitamin C (D) Rhodopsin is the purplish red protein present in rods only

53. Identify the hormone with its correct matching of source and function. (A) Oxytocin - posterior pituitary, growth and maintenance of mammary glands (B) Melatonin - pineal gland, regulates the normal rhythm of sleepwake cycle (C) Progesterone - corpus luteum, stimulation of growth and activities of female secondary sex organs (D) A trial natriuretic factor - ventricular wall, increase the blood pressure.

54. Fight - or - fligh reactions cause activation of (A) The parathyroid glands, leading to increased metabolic rate (B) the kidney, leading to suppression of renin-angiotensin-aldosterone pathway (C) the adrenal medulla, leading to increased secretion of epinephrine and norepinephrine. (D) the pancrease leading to a reduction in the blood sugar levels.

55. A pregnant female delivers a baby who suffers from stunted growth, mental retardation, low intelligence quotient and abnormal skin. This is the result of (A) cancer of the thyroid gland (B) oversecretion of pars distalis (C) deficiency of iodine in diet (D) low secretion of growth hormone

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56. Which of the following statement is correct in relation to the endocrine system ? (A) Non-nutrient chemicals produced by the body in trace amounts that act as intercellular messen- ger are known as hormones. (B) Releasing and inhibitory hormones are produced by the pituitary gland (C) Adenohypophysis is under direct neural regulation of the hypothalamus (D) Organs in the body like gastrointestinal tract, heart, kidney and liver do not produce any hor- mones.

57. Which one of the following shows isogamy with non-flagellated gametes ? (A) Sargassum (B) Ectocarpus (C) Ulothrix (D) Spirogyra

58. Geitonogamy involves (A) fertilization of a flower by the pollen from another flower of the same plant (B) fertilization of a flower by the pollen from the same flower (C) fertilization of a flower by the pollen from a flower of another plant in the same population (D) fertilization of a flower by the pollen from a flower of another plant belonging to a distant population

59. An aggregate fruit is one which develops from (A) multicarpellary syncarpous gynoecium (B) multicarpellary apocarpus gynoecium (C) complete inflorescence (D) multicarpellary superior ovary

60. Pollen tablets are available in the market for (A) in vitro fertilization (B) breeding programmes (C) supplementing food (D) ex situ conservation

61. Function of filiform apparatus is to (A) recognize the suitable pollen at stigma (B) stimulate division of generative cell (C) produce nectar (D) guide the entry of pollen tube

62. Perisperm differs from endosperm in (A) being a diploid tissue (B) its formation by fusion of secondary nucleus with several sperms (C) being a haploid tissue (D) having no reserve food

63. Which one of the following statements is correct ? (A) Endothecium produces the microspores (B) Tapetum nourishes the developing pollen (C) Hard outer layer of pollen is called intine (D) Sporogenous tissue is haploid

64. Animal vectors are required for pollination in (A) Vallisneria (B) mulberry (C) cucumber (D) maize

65. An organic substance that can withstand environmental extremes and cannot be degraded by any enzyme is (A) cuticle (B) sporopollenin (C) lignin (D) cellulose

66. Which of the following is correctly matched ? (A) Onion-Bulb (B) Ginger-Sucker (C) Chlmydomonas-Conidia (D) Yeast-Zoospores

67. What is the function of germ pore ? (A) Emergence of radicle (B) Absorption of water for seed germination (C) Initiation of pollen tube (D) Release of male gametes

68. Plants with ovaries having only one or a few ovules, are generally pollinated by (A) bees (B) butterflies (C) birds (D) wind

69. Filiform apparatus is a characteristic feature of (A) suspensor (B) egg (C) synergid (D) zygote

70. The secretory phase in the human menstrual cycle is also called (A) luteal phase and lasts for about 6 days (B) follicular phase and lasts for about 6 days (C) luteal phase and lasts for about 13 days (D) follicular phase and lasts for about 13 days

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71. If for some reason, the vasa efferentia in the human reproductive system get blocked, the gametes will not be transported from (A) testes to epididymis (B) epididymis to vas deferens (C) ovary to uterus (D) vagina to uterus

72. The testes in humans are situated outside the abdominal cavity inside a pouch called scrotum. The purpose served is for (A) maintaining the scrotal temperature lower than the internal body temperature (B) escaping any possible compression by the visceral organs (C) providing more space for the growth of epididymis (D) providing a secondary sexual feature for exhibiting the male sex.

73. The test-tube baby programme employs which one of the following techniques ? (A) Intra cytoplasmic sperm injection (ICSI) (B) Intra uterine insemination (IUI) (C) Gamete intra Fallopian transfer (GIFT) (D) Zygote intra Fallopian transfer (ZIFT)

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74. Select the incorrect statement with regard to haemophilia. (A) It is a dominant disease (B) A single protein involved in the clotting of blood is affected (C) It is a sex-linked disease (D) It is a recessive disease

75. Which idea is depicted by a cross in which the F generation resembles both the parents ? (A) Inheritance of one gene (B) Codominance (C) Incomplete dominance (D) Complete dominance

76. Read the following four statements (A – D). (A) In transcription, adenosine pairs with uracil (B) Regulation of lac operon by repressor is referred to as positive regulation (C) The human genome has approximately 50,000 genes (D) Haemophilia is a sex-linked recessive discase How many of the above statements are right ? (A) Two (B) Three (C) Four (D) One

77. A test cross is carried out to (A) determine the genotype of a plant at F2 (B) predict whether two traits are linked (C) assess the number of alleles of a gene (D) determine whether two species or varieties will breed successfully.

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78. Which one of the following is wrongly matched ? (A) Transcription - Writing information from DNA to t-RNA (B) Translation - Using information in m-RNA to make protein (C) Repressor protein - Binds to operator to stop enzyme synthesis (D) Operon - Structural genes, operator and promoter.

79. Transformation was discovered by (A) Meselson and Stahl (B) Hershey and Chase (C) Griffith (D) Watson and Crick

80. Select the correct option Direction of Direction of reading of the RNA synthesis template DNA strand (a) 5' – 3' 3' – 5' (b) 3' – 5' 5' – 3' (c) 5' – 3' 5' – 3' (d) 3' – 5' 3' – 5'

81. In a population of 1000 individuals 360 belong to genotype AA, 480 to Aa and the remaining 160 to aa. Based on this data, the frequency of allele A in the population is (A) 0.4 (B) 0.5 (C) 0.6 (D) 0.7

82. Forelimbs of cat, lizard used in walking ; forelimbs of whale used in swimming and forelimbs of bats used in flying are an example of (A) analogous organs (B) adaptive radiation (C) homologous organs (D) convergent evolution

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83. According to Darwin, the organic evolution is due to (A) completion within closely related species (B) reduced feeding efficiency in one species due to the presence of interfering species (C) intraspecific competition (D) intraspecific competition

84. The eye of octopus and eye of cat show different patterns of structure, yet they perform similar function. This is an example of (A) analogous organs that have evolved due to convergent evolution (B) analogous organs that have evolved due to divergent evolution (C) homologous organs that have evolved due to convergent evolution (D) homologous organs that have evolved due to divergent evolution

85. Dinosaurs dominated the would in which of the following geological eras ? (A) Cenozoic (B) Jurassic (C) Mesozoic (D) Devonian

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86. The finch species of Galapagos islands are grouped according to their food sources. Which of the following is not a finch food ? (A) Carrion (B) Insects (C) Tree buds (D) Seeds

87. Which one of the following options gives one correct example each of convergent evolution and divergent evolution ? Convergent evolution Divergent evolution (A) Eyes of octopus and mammals Bones of forelimbs of vertebrates (B) Thorns of Bougainvillea and Wings of butterflies and birds tendrils of Cucurbita (C) Bones of forelimbs of vertebrates Wings of butterfly and birds (D) Thorns of Bougainvillea and Eyes of octopus and mammals tendrils of Cucurbita

88. At which stage of HIV infection does one usually show symptoms AIDS ? (A) Within 15 days to sexual contact with an infected person (B) When the infected retro virus enters host cells (C) When HIV damages large number of helper T - Lymphocytes (D) When the viral DNA is produced by reverse transcriptase

89. Infection of Ascaris usually occurs by (A) Tse-tse fly (B) mosquito bite (C) drinking water containing eggs of Ascaris (D) eating imperfectly cooked pork

90. Identify the site where Wuchereria bancrofti is normally found in human body. (A) Muscles of the legs (B) Blood vessels of the thigh region (C) Skin between the fingers (D) Lymphatic vessels of the lower limbs