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**Subject: Biology**

**Topic: Human Physiology , Ecology**

**M.M. 360 COMPETITIVE TEST**  **Time: 60 Min.**

1. A biologist studied the population of rats in a barn. He found that the average natality was 250 , average mortality is 240 , immigration 20 and emigration 30. The net increase in population is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 10 | b) 15 | c) 05 | d) 0 |

1. The principle of competitive exclusion principle is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) C Darwin | b) GF Gause | c) Mac Arthur | d) Verhulst and Pearl |

1. Which one of the following plants shows a very close relationship with a species of moth, where none of two completed their lifecycle without the other?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Hydrilla | b) Yucca | c) Banana | d) Viola |

1. Between which of the following, relationship is not an example of commensalism?

|  |  |
| --- | --- |
| a) Orchid and tree on which it grows. | b) Cattle Egret and grazing cattle |
| c) Sea anemone and clown fish | d) Female wasp and fig species. |

1. Which type of human population is represented by following pyramids?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Expanding population | b) Vanishing population | c) Stable population | d) Declining population |

1. If ‘8’ drosophila in a laboratory population of ’80’ died during a week, the death rate in the population is \_\_\_\_\_\_.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 0.1 | b) 10 | c) 1 | d) 0 |

1. Which of the following is considered as hot-stop of biodiversity in India?

|  |  |  |  |
| --- | --- | --- | --- |
| a) western ghats | b) Indo-Gangetic plain | c) eastern ghats | d) Aravalli hills |

1. The highest number of species in the world is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) lichens | b) fungi | c) mosses | d) algae |

1. Sacred groves are specially useful in :

|  |  |
| --- | --- |
| a) Generating environmental awareness | b) Preventing soil erosion |
| c) Year-round flow of water in river | d) Conserving rare and threatened species |

1. Alexander Von Humbolt described for the first time :

|  |  |
| --- | --- |
| a) Ecological Biodiversity | b) Laws of limiting factor |
| c) Species area relationship | d) Population growth equation |

1. Which one of the following is not a method of in-situ conservation of biodiversity?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Biosphere reserve | b) wildlife sanctuary | c) botanical garden | d) sacred groves |

1. According to Robert May, the global species diversity is about?

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1.5 million | b) 20 million | c) 50 million | d) 7 million |

1. Habitat loss and fragmentation, over-exploitation, alien species invasion and co-extinction are causes for :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Population explosion | b) competition | c) biodiversity loss | d) natality |

1. Which one of the following is not used for construction of ecological pyramids?

|  |  |  |  |
| --- | --- | --- | --- |
| a) dry weight | b) number of individuals | c) rate of energy flow | d) fresh weight |

1. Of the total incident solar radiation the proportion of PAR is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) More than 80 % | b) About 70 % | c) About 60 % | d) Less than 50 % |

1. Secondary productivity is rate of formation of new organic matter is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) producer | b) parasite | c) consumer | d) decomposer |

1. If 20 J of energy is trapped at a producer level, then how much energy will be available to peacock as food in the following chain?

Plant Mice Snake Peacock

|  |  |  |  |
| --- | --- | --- | --- |
| a) 0.02 J | b) 0.002 J | c) 0.2 J | d) 0.0002 J |

1. Vertical distribution of different species occupying different levels in a biotic community is known as :

|  |  |  |  |
| --- | --- | --- | --- |
| a) zonation | b) pyramid | c) divergence | d) stratification |

1. The mass of living material at a tropical level at a particular time is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) NPP | b) standing crop | c) GPP | d) standing state |

1. Niche is :

|  |  |
| --- | --- |
| a) All the biological factors in the organisms environment | b) The physical space where an organism live |
| c) The functional role played by organism where it lives | d) The range of temp that organism need to live |

1. Which of the following ecological pyramids is generally inverted?

|  |  |
| --- | --- |
| a) Pyramids of number in grassland | b) Pyramids of energy |
| c) Pyramids of biomass in a forest | d) Pyramids of biomass in a seas. |

1. In the equation, GPP – R = NPP , ‘R’ represents :

|  |  |  |  |
| --- | --- | --- | --- |
| a) respiration losses | b) radiant energy | c) retardation factor | d) environment factor |

1. Detritivores breakdown detritus into smaller particles. This process is called :

|  |  |  |  |
| --- | --- | --- | --- |
| a) catabolism | b) fragmentation | c) humification | d) decomposition |

1. The process through which two or more organs interact and complement the functions of one another, called :

|  |  |  |  |
| --- | --- | --- | --- |
| a) coordination | b) homeostasis | c) chemical integration | d) transmission of impulse |

1. The two types of nerves fibres of PNS found associated with brain and spinal cord are :

|  |  |  |  |
| --- | --- | --- | --- |
| a) efferent fibres , mixed fibres | b) sensory and efferent fibres | c) afferent and efferent fibres | d) afferent and mixed fibres |

1. The PNS includes :

|  |  |
| --- | --- |
| a) CNS and Sympathetic neural system | b) somatic neural system and autonomic neural system |
| c) Sympathetic neural system | d) somatic neural system |

1. Nissl’s bodies mainly composed of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) nucleic acid and SER | b) DNA and RNA | c) Proteins and lipids | d) Free ribosomes and RER |

1. Multipolar and bipolar neurons are differ in :

|  |  |
| --- | --- |
| a) number of axons | b) Presence or absence of Nissl’s granules |
| c) number of dendrites | d) Both (a) and (c) |

1. Nerve fibres enveloped with Schwann cells are :

|  |  |  |  |
| --- | --- | --- | --- |
| a) myelinated fibres | b) non- myelinated fibres | c) afferent fibres | d) efferent fibres |

1. In the resting stage of a neuron, concentration gradient generates due to the :
2. High concentration of K+ and low concentration of Na+ inside the axon.
3. High concentration of Na+ and low concentration of K+ inside the axon.
4. low concentration of Na+ outside the axon.
5. High concentration of K+ outside the axon.
6. For the maintenance of ionic gradients across the resting membrane, the sodium-potassium pumps transports :

|  |  |
| --- | --- |
| a) 3 Na+ outwards for 2 K+ into the cell | b) 2 Na+ outwards for 2 K+ into the cell |
| c) 3 Na+ inwards for 2 K+ into the cell | d) 2 Na+ inwards for 2 K+ into the cell |

1. During the propagation of a nerve impulse, the action potential results from the movement of :

|  |  |
| --- | --- |
| a) K+ ions from intracellular fluid to extracellular fluid | b) Na+ ions from extracellular fluid to intracellular fluid |
| c) K+ ions from extracellular fluid to intracellular fluid | d) Na+ ions from intracellular fluid to extracellular fluid |

1. Corpus callosum connects two :

|  |  |  |  |
| --- | --- | --- | --- |
| a) cerebral hemisphere | b) ventricles of brain | c) cerebellar hemispheres | d) optic thalamus |

1. Cerebral cortex consists of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) motor area | b) sensory areas | c) associated areas | d) all of these |

1. The inner part of cerebral hemispheres and a group of associated deep structures like amygdala , Hippocampus, etc form a complex structure called :

|  |  |  |  |
| --- | --- | --- | --- |
| a) arbor vitae | b) limbic system | c) corpora quadrigemina | d) reticular system |

1. Four rounded lobes in mid brain are :

|  |  |  |  |
| --- | --- | --- | --- |
| a) occipital lobe | b) corpora quadrigemina | c) corpora allata | d) cerebral aqueduct |

1. The amount of protein present in plasma of blood is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 6 – 8 % | b) 3 – 4 % | c) 4.5 – 5.5 % | d) 5.5 – 6.0 % |

1. The electrolyte present in blood plasma are :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Na+, Cl – | b) Ca2+ , | c) Mg2+ , | d) All the above |

1. O blood group is universal donor because the blood has:

|  |  |  |  |
| --- | --- | --- | --- |
| a) Antigen A | b) Antigen B | c) both antigens A & B | d) No antigens |

1. Number of leucocytes present in one mm3 of blood is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 2,000 – 3,000 | b) 6,000 – 8,0000 | c) 8,000 – 10,000 | d) 1,00,000 – 15,00,000 |

1. Diapedesis is :

|  |  |
| --- | --- |
| a) Bursting of RBC | b) Bursting of WBC |
| c) Production of WBC | d) Passage of WBC out of blood capillary |

1. Find the correct descending order of percentage proportional of leucocytes in human blood:

a) Neutrophils Basophils Lymphocytes Acidophils Monocytes

b) Neutrophils Monocytes Lymphocytes Acidophils Basophils

c) Neutrophils Lymphocytes Monocytes Acidophils Basophils

d) Neutrophils Acidophils Basophils Lymphocytes Monocytes

1. Blood cell that engulf bacteria by phagocytosis are:

|  |  |  |  |
| --- | --- | --- | --- |
| a) eosinophils & basophils | b) Neutrophils & monocytes | c) basophils & lymphocytes | d) Neutrophils & Lymphocytes |

1. Human heart is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Myogenic | b) Neurogenic | c) Cardiogenic | d) digenic |

1. Dup sound is produced during closure of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Semilunar valve | b) bicuspid valve | c) Tricuspid valve | d) Both (b) & (c) |

1. Sympathetic nervous system:

|  |  |  |  |
| --- | --- | --- | --- |
| a) decrease heart beat | b) increase heart beat | c) Control heart beat | d) No effect on heart beat |

1. Match column I and column II

|  |  |
| --- | --- |
| Column I | Column II |
| A. P wave | I. Depolarisation of ventricles |
| B. QRS complex | II. Repolarisation of ventricles |
| C. T wave | III. Coronary ischemia |
| D. Reducing in size of T wave | IV. Depolarisation of atria  V. Repolarisation of atria |

|  |  |
| --- | --- |
| a) A – IV ; B – I ; C – II ; D – V | b) A – II ; B – I ; C – V ; D – III |
| c) A – II ; B – III ; C – V ; D – IV | d) A – IV ; B – I ; C – II ; D – III |

1. Which one does not use second messenger?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Insulin | b) Prolactin | c) Cortisol | d) adrenaline |

1. Damage of thymus in child may lead to :

|  |  |
| --- | --- |
| a) A reduction in Hb content of blood | b) Loss of cell mediated immunity |
| c) Promotion of Antibody mediated immunity | d) A reduce in stem cell production |

1. Adrenaline and nor-adrenaline are commonly called :

|  |  |  |  |
| --- | --- | --- | --- |
| a) corticoids | b) glucocorticoids | c) catecholamine | d) Sex corticoids |

1. Which statement regarding PTH is correct ?

|  |  |
| --- | --- |
| a) It is a peptide hormone | b) It is stimulates bone reabsorption |
| c) It is hypercalcemic hormone | d) all of these |

1. In males, testosterone is secreted by :

|  |  |  |  |
| --- | --- | --- | --- |
| a) sertoli cells | b) Leydig cells | c) nurse cells | d) cells of epididymis |

1. Anterior lobe of pituitary gland secretes :

|  |  |  |  |
| --- | --- | --- | --- |
| a) FSH , GH , LH | b) STH , GH , TSH | c) TSH , ADH , prolactin | d) ACTH , TSH , oxytocin |

1. Acromegaly causes:

|  |  |
| --- | --- |
| a) Dwarfism | b) Extra growth in height |
| c) Smaller hands, feet and face | d) Extra growth in hands , feet and lower jaw |

1. Depict the correct site of hormone:

|  |  |
| --- | --- |
| a) – glucagon ; – insulin ; – somatostatin | b) – insulin ; – glucagon ; – somatostatin |
| c) – insulin ; – somatostatin ; – glucagon | d) – somatostatin ; – insulin ; – glucagon |

1. Ammonia and urea are waster products derived from the metabolic breakdown of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Lipids | b) Carbohydrates | c) proteins | d) Sugars |

1. Urea and uric acid are :

|  |  |  |  |
| --- | --- | --- | --- |
| a) more toxic than NH3 | b) Less toxic than NH3 | c) Equally toxic than NH3 | d) Non-toxic |

1. Inner to hilum of kidney is a broad funnel shaped structure called :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Cortex | b) Medulla | c) Pelvis | d) calyx |

1. Vasa recta is \_\_\_\_\_\_\_\_\_\_\_.

|  |  |  |  |
| --- | --- | --- | --- |
| a) L – shaped | b) S – shaped | c) U – shaped | d) J – shaped |

1. Which one plays an important role in counter current mechanism?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Vasa recta | b) PCT | c) loop of henle | d) Both (a) & (c) |

1. The medullary gradient is mainly caused by :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Urea and K+ | b) H+ & K+ | c) NaCl and urea | d) urea and H+ |

1. NaCl is transported by the ascending limb of Henle’s loop which is exchanged with :

|  |  |  |  |
| --- | --- | --- | --- |
| a) DCT | b) PCT | c) Ascending limb of vasa recta | d) Descending limb of vasa recta |

1. micturition :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Urethra relaxes | b) Urethra constricts | c) Bladder relaxes | d) none of these |

1. Average pH of urine is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 6 | b) 9 | c) 3 | d) 7 |

1. Renin is released by:

|  |  |  |  |
| --- | --- | --- | --- |
| a) loop of henle | b) collecting duct | c) juxtaglomerular cell | d) renal pelvis |

1. Podocytes are the cells present on :

|  |  |
| --- | --- |
| a) Outer wall of Bowman’s capsule | b) Inner wall of Bowman’s capsule |
| c) Neck of nephron | d) Wall of glomerular capillaries |

1. Which of the following animals uses protonephridia with flame cell for excretion?

|  |  |  |  |
| --- | --- | --- | --- |
| a) protozoans | b) sponges | c) Cnidarians | d) Platyhelminthes |

1. Vasa recta :

|  |  |
| --- | --- |
| a) is a part of nephron | b) participates in counter current mechanism |
| c) is a blood vessel | d) Both (b) & (c) |

1. The maximum amount of electrolytes and water (70-80%) from the glomerular filtrate is reabsorbed in which part of the nephron?

|  |  |
| --- | --- |
| a) ascending limb of Henle’s loop | b) DCT |
| c) PCT | d) Descending limb of Henle’s loop |

1. The condition of accumulation of urea in the blood is termed as :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Renal calculi | b) Glomerulonephritis | c) uremia | d) Ketonuria |

1. Residual volume is :

|  |  |
| --- | --- |
| a) less than tidal volume | b) greater than inspiratory volume |
| c) greater than vital capacity | d) greater than tidal volume |

1. What is vital capacity of our lungs?

|  |  |  |  |
| --- | --- | --- | --- |
| a) IRV + ERV | b) TLC – RV | c) IRV + TV | d) TLC – ERV |

1. Book lungs are respiratory organs of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Mollusca | b) Mammals | c) Spider | d) earthworm |

1. CO2 dissociates from carbamino haemoglobin when :

|  |  |
| --- | --- |
| a) PCO2 is high and PO2 is less | b) PO2 is high and PCO2 is less |
| c) PCO2 and PO2 are equal | d) None of above |

1. The oxygen haemoglobin dissociation curve will show a right shift in case of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) High PCO2 | b) high PO2 | c) Low PCO2 | d) Less H+ concentration |

1. The maximum volume of air a person can breathe in after a forced expiration is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Vital capacity | b) ERV + TV + IRV | c) TLC – RV | d) All of these |

1. Which of the following statement is incorrect about transport of gases?

|  |  |
| --- | --- |
| a) About 97 % of O2 is transported by RBCs in the blood | b) 3 % of O2 is carried in dissolved state in the plasma |
| c) 20-25 % of CO2 is transported by RBCs | d) 70 % of CO2 is carried in dissolved state in the plasma |

1. Binding of O2 with haemoglobin is primarily related to which of the following factor?

|  |  |  |  |
| --- | --- | --- | --- |
| a) PCO2 | b) PO2 | c) H+ ion concentration | d) Temperature |

1. The amount of oxygen delivered to tissues by 100 ml of blood under strenuous condition is approximately.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 5mL | b) 50 mL | c) 15 mL | d) 150 mL |

1. Diffusion membrane consists of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1 layer | b) 2 layer | c) 3 layer | d) 4 layer |

1. One gram Hb can carry \_\_\_\_\_\_\_ mL O2

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1.34 mL | b) 15 gm | c) 3.14 mL | d) 2.34 mL |

1. The percentage of carbon dioxide carried by Hb as carbamino-haemoglobin is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 70-75 % | b) 5-10 % | c) 20-25 % | d) 80-85 % |

1. Every 100 mL of deoxygenated blood delivers \_\_\_\_\_\_\_\_\_ of CO2 to alveoli.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 4 ml | b) 8 ml | c) 20 ml | d) 40 ml |

1. Carbon dioxide combines with Hb to form:

|  |  |  |  |
| --- | --- | --- | --- |
| a) carbamino haemoglobin | b) carboxyhaemoglobin | c) Oxyhaemoglobin | d) Monoxyhaemoglobin |

1. A molecule of Hb can carry \_\_\_\_\_\_\_ oxygen :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 2 | b) 1 | c) 4 | d) 6 |

1. Pace maker of heart is situated :

|  |  |  |  |
| --- | --- | --- | --- |
| a) In the wall of right atrium | b) on interventricular septum | c) on interauricular septum | d) In the wall of left atrium |

1. cardiac output is blood :

|  |  |
| --- | --- |
| a) pumped by each ventricle /min | b) pumped by ventricle /sec |
| c) pumped by left ventricle /hr | d) received by heart per minute |

1. Hardening of arteries due to deposition of cholesterol and calcium is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Atherosclerosis | b) Thrombosis | c) stenosis | d) Rhinitis |

1. Angina pectoris is a major symptoms of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) myocardial infarction | b) cyanosis | c) High blood pressure | d) low blood pressure |

1. To obtained a standard ECG, a patient is connected to machine by three electrodes

|  |  |
| --- | --- |
| a) One to each ankle and to the left wrist | b) One to each wrist and to the left chest region |
| c) One to each wrist and to the left ankle | d) One to each ankle and to the left chest region |