COMPETITIVE ENTRANCE EXAMINATION INTO HTTC BAMBILI	
CYCLE:SECOND	
<u>LEVEL</u> : 400	Session: 2014
DEPARTMENT: BIOLOGY	
DURATION: 3hrs	

Instructions: Answer all the questions in Section A and Section B by selecting the most appropriate option that answers each MCQ. Write the letter (A, B, C or D) that corresponds to the most correct option in the Answer Booklet provided. Make sure you insert the question paper inside the Answer Booklet before you leave the Examination Hall.

- 1. In aquatic ecosystems, the rate of feeding of Barnacle is influence by the abundance of:
  - a) Zooplankton
  - b) Phytoplankton
  - c) Biocenosis
  - d) Plant population
- 2. In ciliated organisms, ciliary activity can be arrested by the use of reagents which selectively inhibit specific stages in the metabolic pathways of:
  - a) Anaerobic glycolysis
  - b) Anaerobic respiration
  - c) Aerobic glycolysis
  - d) Aerobic respiration
- 3. The evolution of a new species when one population of interbreeding organisms splits into:
  - a) Two separately breeding populations
  - b) Many separately breeding populations
  - c) Four separately breeding populations

- d) Sixteen separately populations
- 4. The most important species in the phylum Apicomplexa are members of the class:
  - a) Annelidea
  - b) Echinoidea
  - c) Coccidea
  - d) Crinoidea
- 5. After the fertilization angiosperms, the egg cell secretes first:
  - a) Albumen
  - b) Ovum
  - c) Cellulose wall
  - d) Cell membrane
- 6. In the higher plants, when the somatic chromosome complements are exect multiples of the haploid number, the phenomenon is called:
  - a) Monoploidy
  - b) Haploidy
  - c) Euploidy
  - d) Heteroploidy
- 7. In general the communication between cell intercellular communications is performed by chemical messengers who are:
  - a) Paracrine agents,
  - b) neurotransmitters,
  - c) Hormones
  - d) All of the above
- 8. Normal alveolar gas is:
  - a) PO<sub>2</sub>=105mmHg and PCO<sub>2</sub>=40mmHg
  - b) PO<sub>2</sub>=400mmHg and PCO<sub>2</sub>=105mmHg

- c) PO<sub>2</sub>=105/2mmHg and PCO<sub>2</sub>=40/2mmHg
- d) PO<sub>2</sub>=40/2mmHg and PCO<sub>2</sub>=105/2mmHg
- 9. In protein sorting, the first branch point is:
  - a) Golgi apparatus
  - b) Lysosomes
  - c) Endoplasmic reticulum
  - d) Peroxisomes
- 10.Most chloroplasts proteins are synthesized on free ribosome in the cytosol and target for import to chloroplast by:
  - a) t RNA
  - b) amino transit peptide
  - c) terminal transit peptide
  - d) amino terminal transit peptide
- 11.It has been estimated that an average green leaf absorbs about 80 –
  85% of light; in photosynthesis the quantity utilized is about:
  - a) 10%
  - b) 1 10%
  - c) 1%
  - d) 0.05%
- 12. The first steps in the biosynthesis of gibberellins involves the formation of:
  - a) Three phosphoglycerate molecules
  - b) Three purvate molecules
  - c) Three oxalo acetate molecule
  - d) Three acetyl CoA molecule
- 13.In the formation of cork cambium, the outer layer of collenchyma become:

- a) Elongated
- b) Phellogenous
- c) Rectangular
- d) Fusiform
- 14. The development of a multicellular organism involves three processes among which an increase in size of these cells is known as:
  - a) Mersis
  - b) Auxesis
  - c) Differentiation
  - d) Extension
- 15. The occurrence of temperature beyond the tolerance range is commonly the limiting factor in the distribution of organisms and is also responsible for the selection between them of:
  - a) Varieties
  - b) Sub varieties
  - c) Groups
  - d) Sub-group
- 16.When xylem and phloem forms separated bundles alternatively in plants, the vascular system is said to be:
  - a) Conjoint
  - b) Collateral
  - c) Radial
  - d) Bicolatteral
- 17.In cells, the modification of indirect nuclear division is called:
  - a) Free cell formation
  - b) Direct nuclear division
  - c) Indirect nuclear division

- d) Amitosis
- 18. The most important and efficient mechanical tissue widely distributed in plants for the specific purposes of mechanical strength is:
  - a) Collenchyma
  - b) Sclerenchyma
  - c) Parenchyma
  - d) Phloem and xylem
- 19.The thin walled tissue which contained a milky juice or latex in plants is called:
  - a) vascular bundles
  - b) vascular tissues
  - c) laticiferous tissues
  - d) latexious tissues
- 20. when the cell is young the cytoplasm fills in the space between:
  - a) The nucleoplasm and cell membrane
  - b) The cell wall and nucleus
  - c) The cell wall and the cell membrane
  - d) The nucleoplasm and protoplasm
- 21.In parietal placentation, the ovary is:
  - a) One chambered
  - b) Two chambered
  - c) Four chambered
  - d) Eight chambered
- 22. When a flower can be divided into two similar half by one vertical sections only, it is said to be:
  - a) Zygomorphic
  - b) Heteromorphic

- c) Automorphic
- d) Asymmetric
- 23. In the development of plant species, the uniparous type of branches is called:
  - a) Cymose
  - b) Racemose
  - c) Uniparious
  - d) Sympodial
- 24. The myosin molecule have projections on them called:
  - a) H zone
  - b) Cross bridge
  - c) Head H zone
  - d) Head cross bridges
- 25. The regulatory proteins that prevent contraction by inhibiting the myosin head from binding to actin are called:
  - a) Tyrosine and tropopin
  - b) Tyrosine and troponine
  - c) Tropopin and tropomyosin
  - d) Tyrosine and myelin
- 26. In the inner core of each ganglion a region of synaptic contact between axons and dendrites is called:
  - a) Connective
  - b) Synapse
  - c) Neuropile
  - d) Gap junction
- 27. The most common and wide spread organ of equilibrium sense is:
  - a) Statocyst

- b) Statolith
- c) Kinocillium
- d) Cupula
- 28. When certain of the immune system detect bacterial or viral pathogen or tumor cells, they released:
  - a) Toxins
  - b) Cytokines
  - c) Cytokinines
  - d) Leukocytes
- 29. The promoter sequences of many polymerase II genes are recognized

by the:

- a) GAGA-binding protein
- b) TATA-binding protein
- c) GUGU-binding protein
- d) TUTU-binding protein
- 30. Complex lipids that are bound to plasma cholesterol and transport cholesterol from peripheral tissues to liver are:
  - a) Chylomicrons
  - b) LDL
  - c) VLDL
  - d) FDL
- 31.In eukaryotic cells, most of cellular respiration takes place in the:
  - a) Nuclei
  - b) Cytoplasm
  - c) Mitochondria
  - d) Centrioles
- 32. The main enzyme involved in the transcription takes place in the:

- a) DNA polymerase
- b) RNA ligase
- c) RNA polymerase
- d) DNA mutase
- 33.Chitin consists of:
  - a) N acetyl muramic acid
  - b) N acetyl glucosamine
  - c) Glucose units
  - d) N-acetyl muramic acid and N-acetyl glucosamine
- 34. The DNA of eukaryotic cells is wrapped around histones to from
  - a) Chromatin
  - b) Centromeres
  - c) Nucleosomes
  - d) Nucleotides
- 35.During translation, the cell uses information from messenger RNA to produce:
  - a) Nucleic acids
  - b) Proteins
  - c) Fatty acids
  - d) carbohydrates
- 36. Which of the following of amino acids cannot from hydrogen bond with their side (R) group?
  - a) Tyrosine
  - b) Cysteine
  - c) Leucine
  - d) Serine

- 37.During replication, discontinuous pieces of DNA that are synthesized backward are called:
  - a) Okazaki fragments
  - b) Leading fragments
  - c) Ligase fragments
  - d) Lagging fragments

38. The following equation:  $\alpha - D$ Glucose + 1120  $\rightarrow$  +52.50  $\rightarrow$  +190 $\alpha\beta$  -

DGlucose, represents:

- a) Sterio isomerism
- b) Mutarotation
- c) Optical isomeric
- d) Epimerization
- 39. The movement of DNA sequence throughout the genome without the requirement of sequence homology is called:
  - a) Translocation
  - b) Transposition
  - c) Mutation
  - d) Substitution
- 40. Oxidative phosphorylation occurs in:
  - a) Cytoplasm
  - b) Chloroplast matrix
  - c) Mitochondria matrix
  - d) Golgi apparatus

## SECTION B: MINOR PAPER: Genetics, Microbiology, Human Biology

1. A woman heterozygous for polydactyl (extra fingers and toes), a dominant trait, is married to a normal man. What is the probability of producing an offspring that has extra fingers or toes?

- a) 25%
- b) 50%
- c) 75%
- d) 100%
- 2. Rh-negative children (those not producing rhesus antigens D) may be born to either Rh positive or Rh negative parent. Which phenotype is due a dorminant gene?
  - a) RH+ is recessive
  - b) Rh- is dorminant
  - c) Rh+ is dorminant
  - d) Rh- is recessive
- 3. How many phenotype classes are produced by a dihybrid test cross where one parent is heterozygous for both pairs of genes?
  - a) Two
  - b) Four
  - c) Six
  - d) Eight
- 4. A situation in which a gene has more than two alleles is known as:
  - a) Complete dominance
  - b) Codominance
  - c) Plygenic dominance
  - d) Polygenic dominance
- 5. A family of six includes four children, each of whom has a A,B, AB and O. what are the genotypes of parents for this traits?
  - a) IAi and IBi
  - b) IAi and IAi
  - c) IBi and IBi

- d) None of the above
- 6. Albinism in corn plants is caused by a recessive lethal gene that results in death before maturity. What will the adult phenotypic ratio be for the F1 generation of heterogeneous parents?
  - a) All adult F1 albinos
  - b) All adult green, albinos die
  - c)  $\frac{1}{2}$  will be green and  $\frac{1}{2}$  albino
  - d) None of the above
- 7. In the mouse, the dominant sex linked gene B results in a short, crooked tail. Its recessive allele b produces a normal tail. If a normal tailed female is mated with a bent tailed male, what phenotypic ratio should occur in the F1 generation?
  - a) 2 normal females:1 normal male
  - b) 2 normal males and 1 normal female
  - c) 3 females and 1 male
  - d) 3 males and 1 female
- 8. The physical characteristics of an organism are its:
  - a) Genetics
  - b) Heredity
  - c) Phenotype
  - d) Genotype
- 9. Changes in the DNA sequence that affect genetic information are known as:
  - a) Replication
  - b) Transformation
  - c) Mutation
  - d) Prokaryotes