

RAMAKRISHNA MISSION VIDYAMANDIRA

Belur Math, Howrah – 711 202

ADMISSION TEST – 2015; MICROBIOLOGY (Honours)

Date : 17-06-2015

Full Marks : 50

Time: 03:00 p.m – 04:00 p.m

Instructions for the candidate

Answer all the questions given below. Each question carries 1 mark. ½ mark will be deducted for a wrong answer. Tick (✓) the correct option. The tick must be very clear — if it is smudgy or not clear, no marks will be awarded.

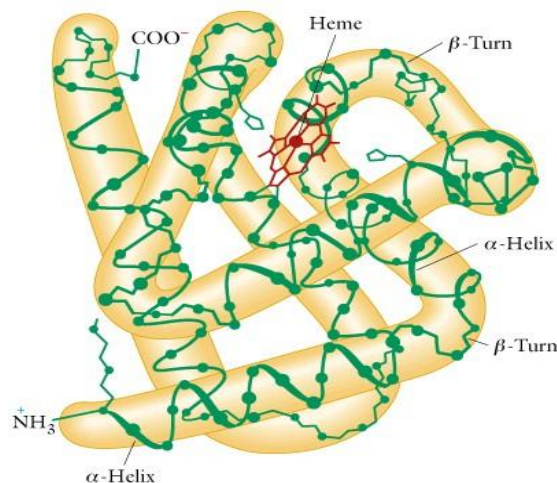
Name of the student : _____

Application No. : _____

A. Multiple choice type questions :

- The transgenic bacteria “**Superbug**” developed by Prof. Ananda Mohan Chakraborty refers to
 - Agrobacterium tumefaciens*
 - Pseudomonas aeruginosa*
 - Pseudomonas putida*
 - Bacillus thuringiensis*
- Penicillium* reproduces asexually mainly by formation of
 - Oidia
 - Conidia
 - Chlamydospore
 - Arthrospore
- In human, the correct sequence of spermatogenic stages leading to the formation of sperm in testis is
 - Spermatocyte-Spermatogonia-Spermatid-Sperms
 - Spermatogonia-Spermatocyte- Spermatid-Sperms
 - Spermatid-Spermatocyte-Spermatogonia- Sperms
 - Spermatogonia-Spermatid- Spermatocyte- Sperms
- ABO blood group is controlled by gene *I* which has three alleles- I^A , I^B and I^O . I^O is recessive to I^A and I^B , I^A and I^B are codominant alleles. How many genotypes are possible?
 - 6
 - 3
 - 4
 - 5
- According to IUPAC nomenclature, the chemical name of “Uracil” base of RNA is
 - 2-amino-4-oxo pyrimidine
 - 2, 4-bisoxo-5-methyl pyrimidine
 - 2,4-bisoxo pyrimidine
 - 2-oxo-4-amino pyrimidine
- A women is married for second time. Her first husband was ABO blood type A, and her child by that marriage was type O. Her new husband is type B and their child is type AB. What is the women’s ABO genotype and blood type?
 - $I^A I^O$; Blood type A
 - $I^A I^B$; Blood type AB
 - $I^B I^O$; Blood type B
 - $I^O I^O$; Blood type O
- Which one is not an adaptive feature for cross pollination?
 - Cleistogamy
 - Dicliny
 - Dichogamy
 - Self-sterility
- Triticale* is produced by the crossing between
 - Wheat and maize
 - Wheat and rye
 - Wheat and barley
 - Wheat and oat
- “Beads on a string” refers to describe the structure of
 - DNA
 - Polysaccharide
 - Thylakoid
 - Chromatin
- “Teminism” is the synthesis of
 - RNA from DNA
 - Protein from RNA
 - cDNA from RNA
 - DNA from DNA
- Enzyme that removes positive supercoiling during replication is
 - DNA gyrase
 - DNA ligase
 - Helicase
 - Primase
- Which is not true for genetic code?
 - Genetic code is ambiguous
 - Genetic code is triplet
 - Genetic code is nearly universal
 - Genetic code is commaless
- “Industrial Melanism” is a typical example of
 - Stabilizing selection
 - Directional selection
 - Disruptive selection
 - Air pollution

14. Convergent evolution is illustrated by
 a) Rat and dog b) Dog fish and whale c) Star fish and cattle fish d) Bacteria and protozoa
15. Largest lymphoid organ of human body is
 a) Spleen b) Appendix c) Palatine tonsil d) Liver
16. A disease associated with secretion of toxin is
 a) TB b) AIDS c) Tetanus d) Leprosy
17. The capacity to generate a whole plant from any cell or explants is called
 a) Totipotency b) Pluripotency c) Multipotency d) Differentiability
18. Citric acid is produced by
 a) *Acetobacter aceti* b) *Clostridium butylicum* c) *Aspergillus niger* d) *Penicillium notatum*
19. Which is not a component of a cloning vector?
 a) *ori* site b) a selectable marker
 c) a cloning site d) a gene for transformation
20. In creation of transgenic plant the vector used is
 a) Col E b) pUC18 c) pBR322 d) Ti plasmid
21. Gene silencing technique is a novel strategy to control a nematode disease in tobacco plant root. This is done by using
 a) RNAi b) sRNA c) snRNA d) hnRNA
22. If one molecule of Acetyl CoA is completely oxidized in Krebs's cycle, the number of ATP molecules that will be synthesized is
 a) 30 b) 18 c) 15 d) 12
23. For every CO₂ molecule to be reduced in Calvin cycle it requires
 a) 12 ATP & 12 NADPH b) 3 ATP & 2 NADPH
 c) 6 ATP & 4 NADPH d) 18 ATP & 12 NADPH
24. At what stage of cell cycle histone proteins are synthesized in a eukaryotic cell?
 a) During entire prophase b) During telophase c) During S phase d) During G₂ phase
25. The figure below represents the myoglobin molecule. The molecule shows its



- a) Primary structure b) Secondary structure c) Tertiary structure d) Quaternary structure
26. A prokaryotic RNA catalyzes peptidyl transferase reaction during protein synthesis in cell. It is
 a) 23 S rRNA b) hn RNA c) 16 S rRNA d) 18 S rRNA

27. Match the following :

Organelles	Function
i) Lysosome	A) H ₂ O ₂ metabolism
ii) ER	B) Protein synthesis
iii) Golgi complex	C) Cellular digestion
iv) Peroxysome	D) Transmission of cellular impulses
v) Ribosome	E) Secretion

- a) i)-C, ii)-D, iii)-E, iv)-B, v)-A b) i)-E, ii)-C, iii)-D, iv)-A, v)-B
c) i)-C, ii)-E, iii)-D, iv)-A, v)-B d) i)-C, ii)-D, iii)-E, iv)-A, v)-B
28. Chemiosmotic theory of ATP synthesis in the chloroplasts and mitochondria is based on:
a) Membrane potential b) Na⁺ gradient c) K⁺ gradient d) H⁺ gradient
29. Carbohydrates are commonly found as starch in the plant's storage organs. Which of the following five properties of starch make it suitable as a storage material?
i) Easily translocated ii) Chemically non-reactive iii) Easily digested by animals
iv) Osmotically inactive v) Synthesized during photosynthesis
a) i, iii and v b) i and v c) ii and iii d) ii and iv
30. Albumin contained in human blood plasma is primarily involved in
a) Defence mechanism of the body b) Osmotic balance of body fluids
c) Oxygen transport of blood d) Clotting of blood
31. "Stab cell" refers to
a) Neutrophil b) eosinophil c) Basophil d) Monocyte
32. A competitive inhibitor of succinate dehydrogenase is
a) Malonate b) Malate c) Mevalonate d) α-oxoglutarate
33. DNA content of dividing cell at G₁ phase of cell cycle is represented as
a) 1C b) 2C c) 3C d) 4C
34. The organisms which resemble fungus in one phase of life cycle but *Amoeba* like in another phase of life cycle
a) Diatoms b) Dinoflagellets c) Water molds d) Slime molds
35. Which one of the following has maximum genetic diversity in India?
a) Mango b) Paddy c) Wheat d) Rye
36. A species found in a particular natural habitat only is called
a) Endangered species b) Sympatric species c) Endemic species d) Allopatric species
37. Three-domain system of classification of living kingdom was proposed by
a) Carl Woese b) R. Whittaker c) Bentham and Hooker d) Engler and Prantle
38. The cell wall component which is present only in Gram positive bacteria is
a) Pseudomurein b) Murein c) Hopanoid d) Teichoic acid
39. Due to presence of a particular type of bond between the glucose residues, cellulose is not digested in human gastrointestinal tract. The bond is
a) α (1 → 4) glycosidic bond b) α (1 → 6) glycosidic bond
c) β (1 → 4) glycosidic bond d) β (1 → 6) glycosidic bond
40. In the menstrual cycle the level of progesterone reaches at its climax
a) During ovulation b) After ovulation c) Before ovulation d) During oogenesis

41. The membrane component which reduces the fluidity of the biological membrane is
 a) Phospholipid b) Peripheral protein c) Integral protein d) Cholesterol
42. Which one of the following is not a biofertilizer?
 a) *Rhizobium* b) *Nostoc* c) Mycorrhiza d) *Agrobacterium*
43. The bacteria which cause common food poisoning
 a) *Staphylococcus aureus* b) *Clostridium botulinum* c) *Bacillus subtilis* d) *Escherichia coli*

B. Assertion(A) and Reason(R) type Questions

44. **A:** Generally, a woman does not conceive during lactation period
R: The hormone prolactin initiates and maintains lactation in a woman.
 a) Both **A** and **R** is true and **R** is the correct explanation of **A**
 b) Both **A** and **R** is true and **R** is not the correct explanation of **A**
 c) **A** is true but **R** is false
 d) Both **A** and **R** is false
45. **A:** In eukaryotic cell replication and transcription occurs in the nucleus, but translation occurs in the cytoplasm.
R: Post-transcriptional processing occurs in cytoplasm.
 a) Both **A** and **R** is true and **R** is the correct explanation of **A**
 b) Both **A** and **R** is true and **R** is not the correct explanation of **A**
 c) **A** is true but **R** is false
 d) Both **A** and **R** is false
46. **A:** Human ancestors never used their tails and so the tail expressing gene has disappeared in them.
R: Lamarck's theory of evolution is popularly called the theory of continuity of germplasm.
 a) Both **A** and **R** is true and **R** is the correct explanation of **A**
 b) Both **A** and **R** is true and **R** is not the correct explanation of **A**
 c) **A** is true but **R** is false
 d) Both **A** and **R** is false
47. **A:** Interferons are a type of antibody produced by bacteria infected cells of the body.
R: Interferons stimulates inflammations at the site of injury.
 a) Both **A** and **R** is true and **R** is the correct explanation of **A**
 b) Both **A** and **R** is true and **R** is not the correct explanation of **A**
 c) **A** is true but **R** is false
 d) Both **A** and **R** is false
48. **A:** Reduction division occurs in anaphase I of meiosis
R: Meiosis II occurs to separate the homologous chromosomes.
 a) Both **A** and **R** is true and **R** is the correct explanation of **A**
 b) Both **A** and **R** is true and **R** is not the correct explanation of **A**
 c) **A** is true but **R** is false
 d) Both **A** and **R** is false
49. **A:** Coenzyme is a non-proteinaceous group without which certain enzymes are inactive or incomplete.
R: Coenzymes not only provide a point of attachment to the chemical group being transferred but also influence the properties of the group.
 a) Both **A** and **R** is true and **R** is the correct explanation of **A**
 b) Both **A** and **R** is true and **R** is not the correct explanation of **A**
 c) **A** is true but **R** is false
 d) Both **A** and **R** is false
50. **A:** A cell membrane shows fluidity behaviour.
R: A cell membrane is a mosaic of diverse proteins and lipids.
 a) Both **A** and **R** is true and **R** is the correct explanation of **A**
 b) Both **A** and **R** is true and **R** is not the correct explanation of **A**
 c) **A** is true but **R** is false
 d) Both **A** and **R** is false