B. N. Bandodkar College of Science, Thane

S. Y. B. Sc. (Sem IV) Examination – 2013-14

USMB-401

Duration 2 hrs **Total Marks-60**

N. B. 1) All questions are compulsory.
2) Figures to right indicate full marks.
3) Draw neat and labeled diagrams wherever necessary.

Q.1 A Answer the following (Any two). **12**

1) Describe the structure of viral chromosome.
2) Discuss the law of independent assortment with example.
3) Length of *E coli* genome is 1100uM. It can still fit in a cell with dimensions of 2-4uM. Justify.
4) Why did Mendel use Pea plant for his experiments? Give a brief outline of the experiments conducted by him.

Q.1 B Answer the following (Any three) **3**

1) Define: Allele.
2) State the function of topoisomerase.
3) Define: test cross.
4) Name a protein that forms complex with bacterial DNA in a nucleoid.
5) Which form of DNA is present in a normal cell at neutral pH and physiological salt concentration?
6) Define: locus.

Q.2 A Answer the following (Any two) **12**

1) Explain the history behind the discovery of genetic code.
2) Diagrammatically explain different orders of chromatin packaging in eukaryotes.
3) Explain the role of histone and nonhistone proteins in eukaryotes.
4) Genetic code is nonoverlapping and comma less. Justify.

Q.2 B Answer the following (Any three) **3**

1) Define: genome
2) What is C-value?
3) How many linkage groups are present in humans?
4) State 'Wobble hypothesis'.
5) Name an amino acid that is coded by only one codon.
6) State the significance of ribosome binding assay.

P.T.O.

Q.3 A Answer the following (Any two) 12

1) Explain the classical characters used in taxonomy of bacteria.
2) Explain numerical taxonomy in detail.
3) Write a note on nucleic acid hybridization. Add a note on its significance in phylogenetic analysis.
4) SSU rRNAs are almost ideal for studies on microbial evolution. Justify.

Q.3 B Answer the following (Any three) 3

1) State significance of MLST in taxonomy.
2) Name the scientist who introduced binomial classification.
3) Define species.
4) How is Mol % G + C content calculated?
5) Define biovars.
6) What is a phylogenetic tree?

Q. 4 A Answer the following 12

1. In pea, tall vine (*Le*) is dominant over dwarf (*le*); green pods (*Gp*) dominant over yellow pods (*gp*). A homozygous dwarf, green pea plant is crossed with a homozygous tall, yellow plant. Represent the cross and give the genotype and phenotype of parents, F1 and F2 offsprings.

OR

1. Write a note on prokaryotic transposable elements.
2. Write a note on Exceptions to the genetic code.

OR

2. Differentiate between Euchromatin and heterochromatin.
3. Write a note on Bergey's manual.

OR

3. Explain in detail the use of bacterial DNA fingerprinting in taxonomy.

Q. 4 B Answer the following 3

1. State the central dogma of molecular biology.

OR

1. Define: plasmid.
2. What are nonsense codons?

OR

2. State the relation between chromatin material and chromosome.
3. What is T_m?

OR

3. What is ERIC-PCR used for?

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