2007

ZOOLOGY

PAPER–VU

GROUP–B

Full Marks : 50

Time : 2 hours

Answer any four questions taking at least two
from each Unit

The figures in the right-hand margin indicate marks

*Candidates are required to gi ve their answers in their
own words as far as practicable*

UNIT-1

(Microbiology)

1.. (a) How can bacteria be identified on the basis of various
morphological characters of their colonies?   6

(b) Give two reasons why viruses are considered as
microorganisms. Name a virus causing a common
human disease.   2+1

(**c) State the functions of bacterial plasma membrane. ,l1**
2

2. **(a) What do you mean by diauxic growth of Bacteria?**   **2**

(b) Why 02 is **inhibitory to anaerobic Bacteria?**   **4**

(c) Distinguish between selective media and differential media with example.   2+2

(d) Write Koch'**s postulates.**   2½

3. (a) Briefly point out how different **environmental** factors affect microbial growth.   6

(b) Provide an equation that relates the number of **generations** of a bacteria with their **population at** different times.   1

(c) Classify Eumycetes morphologically and give examples in each case.   4

(d) Which group of microorganisms are most abundant **with respect to others in a soil environment? State two important roles of that group.**   1½

4. **(a) Distinguish** between (any *three)* :   1½×3

    (i) Generation time and Growth rate

    (ii) Spirilla and Spirochaetes

    (iii) Total count and Viable count

    (iv) **Flagella** and Fimbriae

    (v) Capsule and Microcapsule

    (vi) Endotoxin and Exotoxin.

(b) Write short notes *(any four) :*   2x4

    (i)   H-O variation

    (ii) Hopanoid

    (iii) Inclusion granules

    (iv) Actinomyces

    (v) Benchtop tests

    (vi) Bergey's manual.

UNIT-II

(Environmental Physiology and Evolution)

5. **(a) In an industrialized** region, the fitness of **Biston betularia moth** is 1 for the dark farm (DD and Dd) and 047 for the light form (dd). The allele **frequencies at a certain** time are $p = 0.40$ (D allele) and $q = 0.60$ **(d allele**). **Assume now that the allele frequencies are**

    (i)   p=010, q=090
    (ii) p=0.90,   q=010.

    Calculate the corresponding values of A q and compare them with each other and with the one obtained in the first part of this problem.   6

(**4**)

(b) Retinoblastoma is a disease, due to a dominant allele, that leads to early death if left untreated. Assume that the mutation rate from the normal allele to the retinoblastoma allele is 10 -s. What is the equilibrium frequency of the allele in a population where the condition is not treated?

$6\frac{1}{2}$

6. (a) What is Cambrian explosion ? Mention the time and duration of Cambrian **explosion.**

(b) Explain the evolutionary **significance** of Cambrian **explosion**.

$2+1+1 \frac{1+8}{2}$

7.   (a) What do you **mean by genetic polymorphism? Give some examples.**   **2+1**

(b) **What is electromorph** ? **Explain how proportion of polymorphism and heterozygosity are calculated?**

$\frac{11+3}{2}$

(c) Assume that individuals from surrounding popula-tions migrate at a certain rate into a local population. In the next generation (1 - m) of the genes are descendants of residents and m are descendants of migrants. Assume that in the surrounding population a certain allele *A,* , has an average frequency *p,* while in the local population it has the frequency m.

(i) In the next generation, what will be the frequency of A, in the local population?

(ii) What will be the *op* ?

(iii) What will be the difference in allele frequency between the local and surrounding population after the second generation?

$1\frac{1}{2}+1\frac{1}{2}+2$

8. (a) Define reactive oxygen species.

$2\frac{1}{2}$

(b) What are the adaptations undertaken by Xeric **animals to** cope up with **moisture** stress? 4

(c) Compare **the amount** of different oxygen stores **present in diving and non-diving** vertebrates **with examples.** **6**