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PG CBCS
M.Sc. Semester-IV Examination, 2022
BOTANY
PAPER: BOT 402D (SPL PAPER)
(MOLECULAR MICROBIOLOGY &GENETICS)

Full Marks: 40 **Time: 2 Hours**

The figures in the right-hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP-A

1. Answer any <u>two</u> of the following: **4 X 2=8**

a) What is acid fastness? State the mechanism of acid staining. 1+1
b) What is prion? 2
c) What is R-plasmid? 2
d) What function do topoisomerases serve inside cell? 2
e) Mention the special charcters of Mycoplasma. 2
f) What is plaque assay? 2
g) What is c-DNA libray? 2
h) What is diauxic growth? 2

GROUP-B

2. Answer any <u>four</u> of the following: **4 X 4=16**

a) Describe the formation of biofilm. 4
b) Describe the lysogenic life cycle of bacteriophase. 4
c) Name the genes present in HIV genome and state their respective functions. 4
d) Discuss about quorum sensing of Vibrio harveyi. 4
e) What is enrichment culture? What culture conditions are employed for the isolation of nitrifying bacteria from soil? 2+2
f) Define chemosynthesis. Differentiate between anoxygenic and oxygenic photosynthesis. 2+2
g) Describe the genome of phage M_{13}. How can M_{13}virions are released without killing the infected host cell. 1+3
h) What is pure culture? How do you isolate a pure culture? 1+3

GROUP-C

3. Answer any <u>two</u> questions: **8 X 2=16**

a) Briefly describe the mechanism of biological nitrogen fixation with special reference to the nitrogenase structure. Mention the regulatory mechanism of nif. 5+3
b) Prove that mean generation time is the reciprocal of the mean growth rate constant. Calculate mean doubling time where bacterial population increases from 10^3 cells to 10^9 cells in 10 hours. 4+4
c) State the working principles of phase contrast microscopy. Discuss the different parts of SEM. Mention the utilities of TEM. 3+2+3
d) State the different way for viral entry to human cell. Differentiate between exotoxin and endotoxin. Why do acid fast bacteria need a special type of staining? 3+2+3

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