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UG/III/MICB/H/VI/18 (New)

2018

MICROBIOLOGY

[Honours]

PAPER – VI

Full Marks : 90

Time : 4 hours

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

[NEW SYLLABUS]

GROUP – A

Answer any two questions : 15×2

1. (a) What is genotype and phenotype ? $1\frac{1}{2} + 1\frac{1}{2}$

(b) Give the structure of prokaryotic genome. 4

(Turn Over)

(2)

- (c) What is backcross ? 2
- (d) Write short notes on : 2 + 2 + 2
- (i) Incomplete dominance
 - (ii) Co-dominance
 - (iii) Epistasis.
2. (a) What is the operon concept ? 2
- (b) What is the difference between lac and tryptophan operon ? 3
- (c) Give the life sketch of T₄ phage. 5
- (d) What is theta (θ) replication ? 2
- (e) Write note on transcription. 3
3. (a) What is spontaneous and induced mutation ? 2 + 2
- (b) What is the difference between pericentric and paracentric inversion ? 2
- (c) What is microbial mutant ? 2
- (d) What way you will isolate the microbial mutant ? 3

- (e) What is site directed mutagenesis ? 2
- (f) What is "Delbruck's fluctuation test ? 2
4. (a) Describe the steps of *Agrobacterium* mediated gene transfer. 4
- (b) Mention the application of genetic engineering in medicine, agriculture and environmental pollution control. 2 + 2 + 2
- (c) What do you mean by "bioethics of genetic engineering" ? 2
- (d) Write the steps of Recombinant DNA technology. 3

GROUP – B

Answer any five questions : 8 × 5

5. (a) A DNA molecule was digested by restriction enzyme and analysed by gel electrophoresis. Only one band appear – Explain. 4
- (b) How R-plasmid helps in the development of drug resistance ? 4

6. (a) What is Real Time PCR ? 4
(b) Mention the drawbacks of genetic engineering. 4
7. (a) Write a note on SOS repair. 4
(b) Compare between Western blotting and Southern blotting. 4
8. (a) Briefly describe the steps of protein sequencing. 4
(b) Briefly describe nif gene. 4
9. (a) Why pBR322 is considered as suitable cloning vector ? 3
(b) Briefly describe the types of restriction endonuclease with example. 5
10. (a) Distinguish between co-transduction and abortive transduction. 4
(b) Distinguish between genomic library and cDNA library. 4

11. (a) State the protocol used for developing transgenic plant. 4
- (b) Briefly discuss the process of replica plating technique to detect mutation in bacteria. 4
12. (a) Briefly mention the steps of isolation of DNA in the laboratory. 4
- (b) Write notes on cosmid and phagemid. 4

GROUP – C

Answer any five questions : 4 × 5

13. Mention the process of mismatch repair and base excision repair. 4
14. What are okazaki fragments ? Mention the role of topoisomerase and DNA gyrase. 4
15. Why DNA fingerprinting is done ? State the difference between inducible and repressible operon. 2 + 2
16. Mention the molecular mechanism of lysogenic cycle. 4

17. Give an example of Base analogue and state its mode of action. 4
 18. Write note on central dogma. 4
 19. Write note on Interrupted mating experiment. 4
 20. Briefly mention about semiconservative replication. 4
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