

2017

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

[OLD SYLLABUS]

GROUP – A

Answer any two questions : 15 × 2

1. (a) What is nucleosome and linker DNA ? 2 + 1
(b) Write a short note on SOS repair. 4

(Turn Over)

- (c) What is test cross ratio ? Why is it done ? 1 + 1
- (d) In which case of monohybrid cross the F_2 phenotypic and genotypic ratio becomes the same . Show with an example. 2
- (e) Prove that F factor is DNA. 2
- (f) What is prophage ? 2
2. (a) Write a short note on Wobble hypothesis. 3
- (b) What is constitutive and facultative heterochromatin ? 2
- (c) What do you mean by repressor ? Why glucose is called catabolic repressor ? 2 + 3
- (d) What is leader sequence ? Why binding of CAP-CAMP complex is essential in lac operon ? 1 + 4
3. (a) Discuss the role of ter sites and tus protein in termination of replication. 4

- (b) Distinguish between Z DNA and B DNA. 3
- (c) Write down the application of genetic engineering in medicine and agriculture. 3
- (d) What is cosmid and phagemid ? 3
- (e) What do you mean by restriction map ? 2
4. (a) Compare and contrast Southern blotting with Western blotting. 6
- (b) Write down different steps for isolation of a gene. 4
- (c) Write down the steps of photoreactivation. How thymine dimers are repaired ? 2 + 2
- (d) What is forbidden base pairing ? 1

GROUP – B

Answer any five questions : 8 × 5

5. (a) What is cDNA library ? Mention the steps for making c-DNA library of yeast. 2 + 2

- (b) Differentiate between lytic and lysogenic life cycle. 4
- (a) Write a short note on hybridization technique. 5
- (b) What is Bt cotton? Mention its utility. 2 + 1
- (a) Compare between co-transduction and abortive transduction. 4
- (b) What is helper phage? 2
- (c) What are IS elements? 2
8. (a) What is deletion loop? What is paracentric and peticentric inversion? How dicentric bridges are formed? 1 + 3 + 1
- (b) How F' is generated? 2
- (c) Mention the role of promoters in transcription. 1

9. (a) State the role of initiation factors in translation. 4
- (b) Mention the steps of PCR. How Taq polymerase differs from DNA polymerase. 3 + 1
10. (a) (i) Mention a mechanism by which a foreign DNA is introduced and inserted into the bacterial DNA.
- (ii) What are cloning vectors? 4 + 1
- (b) What is transition of transversion? 2
- (c) Mention one exception of Mendellism. 1
11. (a) Why are polytene chromosomes termed so? How they are formed? What are chromosomal puffs and balbiani rings? 1 + 2 + 2
- (b) Mention the role of Base analogous in generating mutation. 3

12. (a) What is interrupted mating experiment ?
Why antibiotic sensitive Hfr is taken ? 1 + 2
- (b) Write a short note on RFLP. 4
- (c) What is DNA fingerprinting ? 1
13. (a) Write down the application of exonuclease III. 2
- (b) How BER (Base Excision Repair) differs from NER (Nucleotide Excision Repair) ? 3
- (c) What is electroporation ? 2
- (d) What is nuclein ? 1
14. (a) Write briefly on application of nif gene.
How antirabies vaccine is prepared using biotechnology ? 2 + 2
- (b) How frameshift mutation showed by Crick proved that Codon is triplet ? 3

- (c) Name an artificial inducer of lac operon. 1

GROUP – C

Answer any five questions : 4 × 5

15. (a) Write a short note on p^{BR322} . 4
- (b) What is minimal medium and supplementary medium? How auxotrophs are screened? 2 + 2
- (c) Give detailed structure of nucleosome. 4
- (d) Mention the function of different arms/loop of t-RNA related to protein synthesis. 4
- (e) (i) Name a virus with ss DNA and ds RNA
- (ii) What is sn RNA and hn RNA? 2 + 2
- (f) What is tautomerism? How does it induce mutation? 4

- (g) How specialized transduction differs from generalised transduction ? 4
- (h) What is blue-white selection ? 4
- (i) What is satellite DNA ? State its significance. 2 + 2
- (j) What is replicon and primosome ? 2 + 2
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