No. of Printed Pages : 4

RBC-003

Ph.D. IN BIOCHEMISTRY (PHDBC)

Term-End Examination

00175

June, 2018

RBC-003 : BIOCHEMICAL AND MOLECULAR BIOLOGICAL TECHNIQUES

Time : 3 hours *Maximum Marks : 100*

Note : *The question paper consists of three sections, A, B and C. Answer* ***all*** *the questions.*

SECTION A

1. (a) Define the following terms : *5×2=10*

(i) Homogenisation

(ii) Distribution Coefficient (K_d)

(iii) pH electrode

(iv) Gene knockout

(v) SDS-PAGE

(b) Write one application for each of the following : $5 \times 1 = 5$

(i) Weighing balance

(ii) pH meter

(iii) Primer

(iv) Liquid Nitrogen

(v) RPMI

(c) Differentiate between Molarity and Normality. How will you prepare a 100 mL solution of 0·5 M glucose ?
(Molecular weight = 180) 5

SECTION B

*Answer any **five** questions.* *5×6=30*

2. What is sterilization ? Briefly describe the various sterilization techniques used in cell culture. *6*

3. Write the principle and applications of gel filtration chromatography. *6*

4. Define pH. Explain the role of biological buffers in maintaining the pH. *6*

5. Differentiate between real time PCR and RT-PCR. *3+3=6*

6. What is DNA sequencing ? Name different methods for DNA sequencing and briefly describe any one. *6*

7. Write the principle of any ***two*** of the following techniques : *2×3=6*

   (a) ELISA

   (b) Electrophoresis

   (c) Gene cloning

8. What is the role of growth medium ? Give two examples each for the growth media used for microbial and animal cell cultures. *6*

SECTION C

*Answer any **five** questions.* *5×10=50*

9. Design an experiment for subcellular fractionation from an animal tissue. *10*

10. Explain the principle, procedure and applications of Gas Liquid Chromatography. *10*

11. Describe Gel retardation assay and DNAse footprinting with suitable diagrams. *10*

12. Describe the principle and applications of FACS. *10*

13. Explain how molecular weight of a DNA sample can be determined using agarose gel electrophoresis. *10*

14. Give an account on cloning vectors with suitable examples. *10*

15. Write short notes on any ***two*** of the following : *5+5=10*

(a) Growth curve of *Escherichia coli* and measurement of doubling time

(b) Immunoelectrophoresis

(c) Microarray

(d) Western Blotting