M.Phil 1st Semester Examination, 2019

LIFE SCIENCE

(*Instruments and Techniques in Biological Research*)

PAPER –LSC-114

Full Marks : 40

Time : 2 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

GROUP – A

1. Answer any *four* questions : 2 × 4

(*a*) Mention the advantages of Pfu polymerase over Taq polymerase.

(*b*) Name two detectors used with GC system.

(*c*) What is numerical aperture ?

(*d*) What are different electrodes used in ECG ?

(*e*) Explain affinity chromatography.

(*f*) What is radiation exposure ?

(*g*) How could you calculate the change of ultrasound frequency (Δf) during image formation ?

GROUP – B

2. Answer any *four* questions : 4 × 4

(*a*) Mention different steps for preparation of sample for SEM analysis.

(*b*) Write down the application of tracer technology in biological science.

(*c*) Mention different detector systems used in HPLC.

(*Continued*)

(*d*) Mention different components used in PCR mixture. Write down the functions of each component.

(*e*) How do you detect the granularity and internal morphology of a cell by Facs – Discuss with a diagram.

(*f*) Write down the relationship between gradient coil and radio frequency coil during image formation.

GROUP – C

3. Answer any *two* questions : 8 × 2

(*a*) (*i*) Write down the principle of NMR.

(*ii*) Mention applications of UV-VIS and IR spectroscopy. 3 + (2 + 3)

(*b*) (*i*) Write down the mechanism of 3D image formation in USG.

(*ii*) How can you explain single nucleotide polymorphism using RFLP method ? 4 + 4

(*c*) (*i*) Write down the process of gel filtration chromatography.

(*ii*) Mention applications of fluorescence microscope. 4 + 4
