B.Sc III Year

Semester-V

Molecular Biology and Recombinant DNA Technology

Practical exam Question Bank

MAJOR PRACTICALS

1. Give the principle of isolation of DNA from bacterial cells. Perform the experiment for the same and report the result.
2. Write the principle and procedure involved in isolation of plasmid DNA. Isolate plasmid DNA using alkaline lysis method.
3. What is the composition of agarose gel and buffers required for electrophoresis. Explain the protocol for preparation of buffers and casting of gel. Load the given samples on the provided gel and report the molecular weight of the sample.
4. Explain the principle of spectrophotometer. What is the absorbance maxima for DNA? Identify the concentration of the given DNA sample and interpret the purity of DNA based on 260/280 values.
5. What is the composition of stacking gel and resolving gel required for SDS-PAGE. Explain the protocol involved in separation of proteins by this method. Prepare and load the given samples on the provided gel and report the molecular weight of the sample.
6. Give the principle and program of polymerase chain reaction. What are the components of PCR reaction mixture? Prepare a reaction mix with the given template and primers and perform PCR.
7. What is Restriction digestion? Perform restriction digestion of the given DNA sample using given restriction enzymes and report the result.
8. Sketch the principle and procedure of bacterial transformation. Carryout the transformation with the given plasmid and vector sample and spread them on plates containing appropriate antibiotic.

MINOR PRACTICALS

1. Carry out ethanol precipitation of the given genomic DNA sample and show the precipitate.
2. Carry out ethanol precipitation of the given plasmid DNA sample and show the precipitate.
3. Prepare and load the given DNA sample in the wells of agarose gel.
4. Report the concentration given DNA sample using spectrophotometer.
5. Prepare and load the given protein samples for SDS-PAGE
6. Prepare a reaction mixture with the given DNA and primers for PCR.
7. Prepare a reaction mixture for restriction digestion.
8. Identify and give the number of transformed colonies on the given plate.

SPOTTERS

1. Structure of Lac operon
2. Structure of RNA polymerase
3. Transcription initiation
4. Splicing mechanism
5. PBR322
6. Western blot
7. Gel picture of DNA
8. Gel picture of protein

B.Sc Practical Examinations
Subject : Plant Biotechnology

Question Bank (Major Experiment):

1. Write the procedure and demonstrate surface sterilization of the given leaf explants and its inoculation on to the culture medium.
2. Write the principle for the callus initiation. Write the procedure and demonstrate callus initiation from the given explants.
3. Write the procedure and demonstrate protoplast isolation from the given explants and subsequent culture of protoplast.
4. Write the principle and procedure for the *Agrobacterium* mediated transformation of the given explants.
5. Write the principle for preparation of synthetic seeds. Write the procedure and demonstrate synthetic seeds preparation from the callus cultures of the given explants.

Question Bank (Minor Experiment)

1. Perform the surface sterilization of the given internode explants and their inoculation on to the culture medium.
2. Write the procedure for establishment of cell suspension cultures of the selected plant species.
3. Demonstrate synthetic seeds preparation from the callus cultures of the given explants.
4. Write the procedure for preparation of media for plant tissue culture.

Spotters –

i) Callus culture
ii) Autoclave
iii) Plant tissue culture media
iv) Cell suspension culture
v) Isolated protoplasts of tobacco leaf
vi) Haploids obtained from Anther culture
vii) Ti plasmid vector map
viii) Plant cell totipotency
ix) Somatic Embryos
x) Meristem culture
xi) Micropropagation
xii) Embryo culture
xiii) Somatic hybrids
xiv) Bt Cotton
xv) Golden Rice

SEMESTER-V
ELECTIVE THEORY (B)
MEDICAL BIOTECHNOLOGY

PRACTICAL QUESTION BANK

Major Questions

1. Write in detail the principle and procedure for karytoyping. Arrange the chromosomes in the given photomicrograph according to their karyotypic arrangement.
2. Identify the given pedigree patterns and write briefly about the identifying features of the pedigree.
3. What is the principle for Dot ELISA? Write in detail the procedure for performing Dot ELISA. Report the Dot ELISA result of the given ELISA strip.
4. What is the principle for genotyping using PCR-RFLP. Perform electrophoresis of the given digested sample and report the genotype.
5. Write the principle and procedure for detecting DNA damage using comet assay. Measure the length of the comet tail provided to you and comment on the quality of the DNA.
6. Which media is used for the culture of a continuous adherent cell line? Write in detail the procedure for culturing a human adherent continuous cell line.

Minor Questions

1. Identify the given karyotype and write the characteristic features of the karyotype.
2. Write the characteristic features of autosomal dominant / autosomal recessive / X-linked recessive / mitochondrial inheritance pedigree patterns.
3. Write the principle for Dot ELISA. Add a note on its significance.
4. Write the principle for genotyping of candidate genes using PCR-RFLP.
5. Explain the principle for estimation of C-reactive protein.
6. What is the significance of estimating C-reactive protein?
7. Write the principle for assessing DNA damage by using comet assay.
8. Give the protocol for isolation of stem cells from mouse bone marrow
9. Which media is used for the culturing of HeLa cells?

Spotters

1. Amniocentesis
2. Normal Human male / female Karyotype
3. G banding
4. Karyotype of Trisomy 21, Klinefelters syndrome, Turner Syndrome
5. Translocation eg: Philadelphia chromosome
6. Inversion
7. Autosomal dominant/ recessive pedigree
8. X-linked recessive pedigree
9. Mitochondrial inheritance pedigree
10. Gene augmentation therapy
11. CO2 incubator
12. T flask
13. Cell culture media
14. Comet assay