**QP Code: Reg. No.-----------------**

**B. Sc. DEGREE (C.B.C.S.S) EXAMINATION NOVEMBER 2015**

**Fifth Semester**

**Core16- BT5B16U RECOMBINANT DNA TECHNOLOGY**

**(For B. Sc. Biotechnology)**

**Time: Three hours Maximum Marks: 80**

1. **Answer all questions**

1. What is RNase H?

2. What is c DNA?

3. Define insertional inactivation

4. What is a shuttle vector?

5. Write down the function of polynucleotide kinase.

6. What is microinjection?

7. What is plasmid incompatibility?

8. Write down the restriction sequence of Eco R1 and Bam HI

9. What are isoschizomers?

10. Write the principle behind CaCl2 mediated gene transfer

 **(1x10-10 marks)**

 **II. Answer any eight of the following**

11. What is chromosome walking?

12. What is a Binary vector?

13. Briefly explain the features of CaMV vectors.

14. What are biolistics?

15. Differentiate between marker genes and reporter genes.

16. What is dot blotting?

17. What is alpha complementation?

18. Write the advantages of M13 vectors

19. What are type I restriction enzymes?

20. What is the significance of Klenow fragment?

21. What is reverse transcriptase?

22. What is a cosmid?

  **(2x 8 – 16 marks)**

**III. Answer any six of the following**

23. What is terminator gene technology? Explain the mechanism involved in the control of plant gene expression.

24. Briefly explain concept of molecular pharming.

25. Describe the various stages involved in performing PCR experiment.

26. Write a note on human genome project.

27. What are the different stages in the construction of genomic library?

28. Discuss the various desirable properties of an ideal vector.

29. Discuss the various steps in the production of recombinant insulin.

30. Compare pBR32 and YAC vector systems

31. Discuss the different types of PCR techniques used in Molecular Biology

 **(4x6-24 marks)**

**IV. Answer any two of the following ( 15 marks each)**

32. Explain the various steps involved in the creation of transgenic plant using *Agrobacterium*. Discuss the features of various plant vectors used in plant Recombinant DNA experiments.

33. What are the various applications of Recombinant DNA technology? Discuss in detail how this technique is useful in medical applications?

34. Discuss the various methods of gene transfer in plants. Specify the merits and demerits of each method.

35. Write an essay on plasmid vectors.

 **(15x2-30 marks)**

**QP Code: Reg. No.-----------------**

**B. Sc. DEGREE (C.B.C.S.S) EXAMINATION NOVEMBER 2015**

**Fifth Semester**

**Core 17 -BT5B17U INDUSTRIAL BIOTECHNOLOGY**

**(For B. Sc. Biotechnology)**

**Time: Three hours Maximum Marks: 80**

1. **Answer all questions**

1. What are auxotrophs?

2. What is crowded plate technique?

3. What is freeze drying?

4. What is an air lift fermentor?

5. What is tachometer?

6. What are baffles?

7. Specify the advantages of bioprocess over chemical process ?

8. What is market potential of a product?

9. Name the industrially important microbe used in the production of vitamin B12.

10. Specify the application of check valves used in bioreactor designing. **(1x10 = 10 marks)**

**II. Answer any eight of the following**

11. What is sonication? Discuss its application in bioprocess?

12. What is secondary screening? Name some of the secondary screening methods used in bioprocess.

13. Discuss the importance of drying in bioprocess. Name some of the drying methods used for fermentation products.

14. Give the schematic representation of a CSTR?

15. What are spargers? Specify the different types of spargers used in bioreactors.

16. Explain the advantages and disadvantages of defined and undefined media used in bioprocess.

17. What is a continuous culture? Discuss the applications of continuous culture in bioprocess.

18. What is specific growth rate ? Specify how it can be estimated in a batch process.

19. What are chelators used in fermentation media. Give an example.

20. What are antiform agents used in fermentation media? Give an example.

21. What is dialysis? Explain its applications in industrial Biotechnology.

22.What is gelfiltration? How is it useful in the purification of proteins? **(2x 8 = 16 marks)**

**III. Answer any six of the following**

23. Discuss the various stages in the fermentation production of aminoacids.

24. Discuss the significance of centrifugation technique in bioprocess.

25. Discuss the various methods of cell disruption. Explain the principle behind each method.

26. Explain the various advantages of bioprocess. Specify some of the significant applications of bioprocess.

27. Explain various types of online and offline instruments connected to bioreactor. Comment on their applications.

28. What is a packed bed reactor? Comment on its application.

29. What is solid state fermentation? Specify its applications.

30. What is cell immobilisation? Comment on its applications in bioprocess.

31. What are inducers and inhibitors used in media designing in fermentation? **(4x6 = 24 marks)**

**IV. Answer any two of the following**

32. Discuss the various methods of strain improvement. Explain each method with suitable examples.

33. What are the various methods of downstream processing? Discuss the principle behind each method.

34. Explain the significant functions of various components in a typical bioreactor. Discuss the various types of bioreactors used in fermentation process.

35. Discuss the various stages in the fermentation production of antibiotics. **(15 x2 = 30 marks)**

**QP Code: Reg. No.-----------------**

**B. Sc. DEGREE (C.B.C.S.S) EXAMINATION NOVEMBER 2015**

**Fifth Semester**

 **Core 18 - BT5B18U ANIMAL BIOTECHNOLOGY**

**(For B. Sc. Biotechnology)**

**Time: Three hours Maximum Marks: 80**

1. **Answer all questions**

1. What is a balanced salt solution?

2. What is an established cell line?

3. What is monolayer culture?

4. Specify the importance of CO2 incubator in animal cell culture?

5. What are hybridoma cells?

6. What is the use of knock in animals?

7. State the significance of transformation in oncology.

8. Define cellular differentiation.

9. What is the role of serum in animal cell culture media?

10. Write down the significance of adenovirus in medical Biotechnology.

 **(1x10=10 marks)**

 **II. Answer any eight of the following**

11. Explain the phenomenon of contact inhibition.

12. What is HAT medium?

13. What is Hayflick’s limit? What is its significance?

14. State the importance of growth factors in media?

15. What is microfiltration?.

16. What is passaging of cells?

17. What are stem cells?

18. What is transfection?

19. What is the role of transgenic cow in milk industry.

20. What is angeogenesis?

21. What is knock out mouse?

22. What is metastasis?

 **(2x 8 = 16 marks)**

 **III. Answer any six of the following**

23. Briefly explain the methods of organ culture.

24. What is role of hormones in animal cell culture media?

25. What is totipotency? Why animal cells are difficult to be maintained in culture conditions?

26. Describe the production of metabolites through animal cell culture.

27. Discuss the applications of organ culture.

28. What do you mean by transgenic fish? Give examples and applications.

29. Role of cell culture in the production of vaccines.

30. Write down the significance of serum free media.

31. Compare the properties of animal cells –normal and cancerous in culture.

 **(4x6=24 marks)**

**IV. Answer any two of the following.**

32. Discuss the salient features of various animal vectors in genetic engineering.

33. Explain the various stages in the production of monoclonal antibodies.

34. Discuss the various applications of animal cell culture in the field of medicine.

35. Explain the significance of media designing in animal cell culture. Discuss the composition of some of the media used in animal cell culture.

  **(15x2=30 marks)**

**FIFTH SEMESTER B.Sc BIOTECHNOLOGY DEGREE**

**PRACTICAL EXAMINATION NOVEMBER 2015**

**BT5B19U - RECOMBINANT DNA TECHNOLOGY AND INDUSTRIAL BIOTECHNOLOGY**

**Time: 2 days (9.30 am to 4.00 pm ) Total Marks: 80**

1. Isolate plasmid DNA from the given strain and confirm its presence by agarose gel electrophoresis.

(DNA isolation: Principle – 1, Procedure - 3, Performance - 4, Result & Interpretation – 1+1; Electrophoresis: Principle – 1, Procedure – 3, Loading – 3, Result (sample & marker bands) – 1+1, Interpretation – 1) **(20 marks)**

1. Perform screening of the amylase producing isolates from soil.

 (Principle – 2, Procedure -4, Serial dilution -3, Plating-2, Result-2, Interpretation – 2) **(15 marks)**

1. Immobilize the bacterial cells and detect the presence of cells in the beads using a standard procedure.

 (Immobilization: Principle – 2, Procedure -3, Performance - 1, Result-1, Interpretation-1; Cell detection: Principle-1, Procedure- 3, Observation -1, Result – 1, Interpretation – 1)  **(15 marks)**

4. Write the principle and procedure of submerged fermentation.

(Principle -1, Procedure -4) **(5 marks)**

1. Identify and comment on a……, b……., c…….., d……., e………(2 valid points each)

(2 marks each: Identification –1, Comment – two valid points – 1) **(10 marks)**

6. Record **(5 marks)**

7. Viva (based on practical syllabus) **(10 marks)**

**QP Code: Reg. No.------------**

**B.Sc DEGREE (CBCSS) EXAMINATION, NOVEMBER 2015**

**FIFTH SEMESTER**

**OPEN COURSE – TISSUE CULTURE TECHNIQUES**

**(For B. Sc. Biotechnology)**

**Time: Three Hours Maximum: 80 marks**

**I. Answer all questions**

1. What is Totipotency?

2. What is HEPA filter?

3. Describe about Ti Plasmid.

4. What is a marker gene?

5. Who reported haploid plants from anther culture for the first time?

6. What is the temperature, pressure and time used for sterilization in autoclave?

7. What is Nurse culture?

8. What is virus indexing ?

9. What is Micrografting?

10. Who is the father of plant tissue culture? **(1x10=10 Marks)**

**II. Answer any eight of the following**

11. What is Lag Phase in cell growth?

12. What is PDL?

13. Describe advantages and disadvantages of primary cell culture.

14. What is the iron source in MS medium?

15. What is the role of sucrose in Tissue culture medium?

16. What is a cybrid ?

17. Why we use horizontal and vertical laminar flow hood?

18. What are synthetic seeds?

19. What is embryo rescue?.

20. What is somatic embryogenesis?

21. How a haploid cell can be diploidized in culture?

22. What is the use of *in vitro* pollination? **(2×8=16 Marks)**

**III. Answer any six of the following**

23. What is MTT Assay?

24. How to isolate specific animal cells?

25. How to sterilize an explant?

26. Describe the working of a laminar air flow.

27. What is the significance of cell suspension culture?

28. Which are the techniques used for analyzing viability of cultured cells?

29. Briefly explain the role of anther and pollen culture in plant breeding?

30. Which are the direct DNA transfer methods?

31. Explain two examples of crop improvement using genetic transformation?

**(4×6=24 Marks)**

**IV. Answer any two of the following**

32. Enumerate some of the valuable products that can be obtained from animal cell culture.

33. Write an essy on animal cloning. What are the merits and demerits of this technique?

34. Explain the steps involved in isolation, culture and regeneration of protoplasts?

35. Explain crop improvement using genetic transformation with examples?

 **(15x2=30 Marks)**

**QP Code: Reg. No.------------**

**B.Sc DEGREE (CBCSS) EXAMINATION, NOVEMBER 2015**

**FIFTH SEMESTER**

**OPEN COURSE – BIOTECHNOLOGY FOR SUSTAINABLE DEVELOPMENT**

**(For B. Sc. Biotechnology)**

**Time: Three hours Maximum marks: 80**

1. **Write brief notes on all of the following questions**

1. Cyanobacteria.

2. Diazotrophs.

3. Eutrophication.

4. Edible mushrooms used in India.

5. *Bacillus thuringiensis*.

6. Leghaemoglobin.

7. Azolla.

8. Nitrogenase.

9. Types of micorrhiza.

10. Rhizobium. **(1×10=10 marks)**

**II. Answer any eight of the following**

11. Write a note on nutritional value of mushrooms.

12. Write examples of nitrogen fixing organisms.

13. What is vermicomposting?

14. Explain diagnostic probes.

15. Temperature profile in composting.

16. Explain biopesticides.

17. What are the advantages of probiotics?

18. Write a note on legume – Rhizobium symbiosis.

19. What are the applications of biotechnology in aquaculture?

20. What are the types of earthworms extensively used for vermiculture?

21. Applications of biosurfactants.

22. Describe the type of association seen in lichen. **(2×8=16 marks)**

**III. Answer any six of the following**

23. What is spawn and how it is prepared?

24. Describe the different types of biofuels.

25. Describe the process of nitrogen fixation.

26. What is biogas? Give a detailed account of biogas production.

27. Microorganisms involved in composting.

28. Write a note on marine natural products.

29. Explain the significance of solid waste management.

30. What are the disadvantages of chemcial fertilizers?

31. Distinguish between biofilters and biopolymers. **(4×6=24 marks)**

**IV. Answer any two of the following**

32. Write an essay on biofertilizers as an alternative of chemical fertilizers.

33. Describe the different methods of composting and its advantages.

34. Write an essay on natural raw materials and its applications.

35. Describe the process of mushroom cultivation. **(15×2=30 marks)**

**QP Code: Reg. No.------------**

**B.Sc DEGREE (CBCSS) EXAMINATION, NOVEMBER 2015**

**FIFTH SEMESTER**

**OPEN COURSE – IPR and PATENTS**

**(For B. Sc. Biotechnology)**

**Time: Three Hours Maximum: 80 marks**

**I. Answer all questions.**

1. What is an IPR ?
2. What are GIs?
3. Define trade secret.
4. Cite an example of a GM organism.
5. Explain copy right.
6. Give the expansion of TRIPS.
7. Which ministry of the Government of India controls the **Genetic Engineering Approval Committee?**
8. Expand WIPO.
9. Name the first GI tagged product from India.
10. The system of granting patents in India is governed by which act? (**1x10=10 Marks)**

**II. Answer any eight of the following.**

1. What is a design? Add a note on the procedure for registration of design
2. Explain performers rights.
3. Explain the procedure for registration of the geographical indications under the Geographical Indications Act 1999.
4. Write a brief account on the history of patent system in India.
5. What is meant by piracy of design?
6. Write a note on copyright board.
7. Explain patent of addition.
8. Who is first owner of copyright under Copyright Act ? Explain.
9. Elaborate on copyright infringement.
10. Enumerate the highlights of Budapest treaty.
11. Write a note on Broadcast Reproduction Right.
12. What are the objectives of ‘The Plant Variety Protection and Farmers Rights act 2001’  **(2×8=16 Marks)**

**III. Answer any six of the following**

1. Differentiate between “Industrial Design” and “Layout Design”.
2. What rights are conferred by registrations of Geographical Indications? How these rights are protected?
3. Explain the offences and penalties for infringement of Layout design.
4. Discuss the product patent and process patent in detail.
5. Define invention. Which inventions are patentable?
6. Comment on the major changes in Indian Patent system as post TRIPS effects.
7. Discuss the law relating to revocation and surrender of patents.
8. Explain the highlights of Washington Treaty, 1989.
9. Explain the rights and obligations of patentee. **(4×6=24 Marks)**

**IV. Answer any two of the following.**

1. Effective enforcement of Intellectual Property encourages economic development. Comment.
2. Explain the procedure to obtain a patent.
3. Describe the provisions relating to assignment and license of copyright.
4. Explain the rights and limitations of registered proprietor of a trade mark. **(15×2=30 Marks)**

**QP Code: Reg. No.-----------------**

**B. Sc. DEGREE (C.B.C.S.S) EXAMINATION NOVEMBER 2015**

**Sixth Semester**

**Core course 20- BT6B20U PLANT BIOTECHNOLOGY**

**(For B. Sc. Biotechnology)**

**Time: Three Hours Maximum: 80 marks**

**I. Answer all questions.**

1. What are auxins?
2. What is the carbon source in PTC media?
3. What is meant by totipotency?
4. What is meant by explants?
5. Define callus.
6. What is embryo rescue?
7. What are DH lines?
8. Write a note on macerozyme?
9. What are cybrids?
10. What are *vir* genes? **(1x10=10 Marks)**

**II. Answer any eight of the following.**

1. What is meant by indirect organogenesis?
2. Narrate the enzymatic method of protoplast isolation?
3. What is binary vector system of *A. tumefaciens*?
4. What are the different procedures of ex situ conservation of germplasm?
5. What are the advantages of cryopreservation of germplasm?
6. Write a note on gelling agents in plant tissue cuture?
7. What is meant by biolistics?
8. What are the procedures for somatic hybridization?
9. What are the different steps in somatic embryogenesis?
10. What is the usefulness of organic supplements in MS medium?
11. What are the applications of suspension cultures?
12. How do you make virus free plants by PTC? **(2×8=16 Marks)**

**III. Answer any six of the following**

1. Write a note on gene transfer techniques in plants?
2. How transgenic plants are produced?
3. What are the different sterilization procedures applied in plant tissue culture?
4. Narrate the role of plant hormones in cytodifferentiation?
5. What are the different procedures for insitu conservation of germplasm?
6. What are the applications of somatic hybrids?
7. Write details about direct organogenesis?
8. What are the steps involved in acclimatization of in vitro plants?
9. What are the physical parameters that helps in successful cultures of plants? **(4×6=24 Marks)**

**IV. Answer any two of the following.**

1. What are the applications of transgenic plants?
2. Make a diagram showing the layout of an ideal PTC laboratory. Explain the use of each component?
3. Explain anther culture. What are the advantages of this technique?
4. What are the applications of somaclonal variations in crop improvement? **(15×2=30 Marks)**

**QP Code: Reg. No.-----------------**

**B. Sc. DEGREE (C.B.C.S.S) EXAMINATION NOVEMBER 2015**

**Sixth Semester**

**Core course 21- BT6B21U ENVIRONMENTAL BIOTECHNOLOGY**

**(For B. Sc. Biotechnology)**

**Time: Three Hours Maximum: 80 marks**

**I. Answer all questions**

1. What is meant by Minamata diseases?
2. What are greenhouse gases?
3. What is meant by biomagnification?
4. What is meant by carbon credit?
5. What is COD?
6. What do you mean by algal bloom?
7. What is meant by MPN?
8. What is potable water?
9. What is aerable water?
10. What are catabolic plasmids? **(1x10=10 Marks)**

**II. Answer any eight of the following**

1. What is meant by activate sludge process?
2. What are the significances of COD and BOD?
3. Write down the steps in cellulose biodegradation?
4. What are the single stage reactors?
5. What is meant by activated sludge process?
6. What are land filling?
7. What is the significance of methanogenesis in waste treatment?
8. What are the pros and cons of disinfection by chlorination?
9. Comment on the effect of pesticide pollution in the environment?
10. What are the consequences of ozone layer depletion?
11. What is meant by green chemistry?
12. Write down the steps in lignin biodegradation. **(2×8=16 Marks)**

**III. Answer any six of the following**

1. What are the factors leading to green house effect?
2. What are the different industrial pollutants?
3. What is the significance of bioremediation in heavy metal pollution?
4. What are the different renewable sources of energy?
5. How could different food adulterants be detected?
6. What are the chemical characteristics of waste water?
7. What are presumptive bacteriological tests for drinking water?
8. What are the indications of potable water?
9. What is meant by composting? **(4×6=24 Marks)**

**IV. Answer any two of the following**

1. What are the different anaerobic processes in waste water treatment?
2. What are the processes involved in biodegradation of organic compounds?
3. What are the methods for solid waste management?
4. Write an essay on environmental pollution. **(15×2=30 Marks)**

**QP Code: Reg. No.-----------------**

**B. Sc. DEGREE (C.B.C.S.S) EXAMINATION NOVEMBER 2015**

**Sixth Semester**

**Core course 22- BT6B22U CHOICE BASED COURSES**

**BIOINFORMATICS**

**(For B. Sc. Biotechnology)**

**Time: Three Hours Maximum: 80 marks**

**I. Write brief notes on all of the following questions**

1. FASTA
2. BLAST
3. CLUSTAL
4. SEQUIN
5. GENBANK
6. SwissProt
7. NCBI
8. Rasmol
9. Maximum Parsimony
10. UPGMA? **(1x10=10 Marks)**

**II. Answer any eight of the following.**

1. What is local allignment?
2. What are global allignment?
3. What do you meant by multiple sequence allignment?
4. What is molecular docking?
5. Write a note on molecular modeling?
6. What do you mean by TIGR?
7. What is DNA microarray?
8. What is genomics?
9. Write short note on generation sequencing?
10. What is meant by local q RTPCR?
11. What is matabolomics?
12. What is meant by NMR? **(2×8=16 Marks)**

**III. Answer any six of the following**

1. Write a note on computational biology.
2. Give details of different databases?
3. What are the methods of database searching?
4. Write note on different secondary databases?
5. Give details of software for homology modeling?
6. What are the different structure prediction softwares?
7. Write details about the different data submission tools?
8. What are the different public databases for nucleotides?
9. What is meant by whole genome sequencing? **(4×6=24 Marks)**

**IV. Answer any two of the following**

1. Write an essay on significance applications, and careers in bioinformatics?
2. What are the different phylogenetic softwares?
3. What are the applications of proteomics and transcriptomics?
4. How does human genome sequencing revolutionized bioinformatics? **(15×2=30 Marks)**

**QP Code: Reg. No.-----------------**

**B. Sc. DEGREE (C.B.C.S.S) EXAMINATION NOVEMBER 2015**

**Sixth Semester**

**Core course 22- BT6B22U CHOICE BASED COURSES**

**NANOTECHNOLOGY**

**(For B. Sc. Biotechnology)**

**Time: Three Hours Maximum: 80** **marks**

**I. Answer all questions**

1. What is micelle?

2. What is nanocomposite?

3. Mention two application s of carbon nanowires.

4. What is retention effect?

5. State the significance of albumin designing.

6. What are fullerins?

7. Write down the function of Si RNA?

8. What are nanomedicines?

9. Define a naoparticle.

10. What are dendrimers? **(1x10=10 Marks)**

**II. Answer any eight of the following:**

11. What is blood brain barrier?

12. State the applications of nanocomposites.

13. What is achaotic process?

14. State the properties of nanotubes.

15. What is top down method?

16. What do you mean by metamaterials?

17. Write down the physical properties of nanoemulsions.

18. How micelles are prepared?

19. What is a nanobud?

20. What are nanotubes?

21. Which are the important physicochemical properties of nanoparticles?

22. What is the importance of nanomaterials? **(2×8=16 Marks)**

**III. Answer any six of the following**

23. Comment on the drug –nanomaterial interaction.

24. Explain the role of nanotechnology in cancer treatment.

25. What is receptor mediated endocytosis?

26. How can you prepare a nanoemulsion?

27. Comment on the development of nanobiology in India.

28. Discuss how nanowaste can be removed from the environment.

29. Which are the factors involved in the selection of nanomaterial?

30. How nanomedicines are helpful in diabetics treatment?

31. State the applications of gold nanoparticles. **(4x6=24 Marks)**

**IV. Answer any two of the following**

32. Describe the construction of nanomaterials.

33. Discuss the emerging trends in nanotechnology.

34. Explain the role of nanotechnology in drug delivery.

35. Write down the industrial applications of nanotechnology. **(15x2=30 Marks)**

**QP Code: Reg. No.-----------------**

**B. Sc. DEGREE (C.B.C.S.S) EXAMINATION NOVEMBER 2015**

**Sixth Semester**

**Core course 22- BT6B22U CHOICE BASED COURSES**

**DISEASE AND DIAGNOSTIC BIOTECHNOLOGY**

**(For B. Sc. Biotechnology)**

**Time: Three hours Maximum marks: 80**

**I. Write brief notes on all of the following questions**

1. Name a triplet disorder.

2. Positional cloning.

3. Cystic fibrosis.

4. Immunoassay.

5. STR testing.

6. Southern blotting.

7. β-thalassemia

8. G banding.

9. FISH.

10. Name two chromosomal disorders. **(1×10=10 marks)**

**II. Answer any eight of the following.**

11. Functioning of electron microscope.

12. Sex chromosomal genetic disorder.

13. Tumour markers.

14. Diagnostics of HIV.

15. Fragile X syndrome.

16. Karyotyping.

17. PCR.

18. Genetic profiling.

19. SNP testing

20. FAB testing.

21. Avian flu.

22. Duchenne’s muscular dystrophy. **(2×8=16 marks)**

**III. Answer any six of the following.**

23. Give an account of triplet disorder.

24. How can we identify disease genes? Explain.

25. Give a note on viral disease diagnostics.

26. Mention the significance of mitochondrial sequencing.

27. What is karyotyping analysis? Point out its significance.

28. Explain molecular genetics of sickle cell anaemia.

29. Give the importance of Y-STR testing and mitochondrial sequencing in forensic science.

30. Write about the genetic disorders - Cystic fibrosis and Alzheimer’s disease.

31. Give an account on muscular disorders. **(4×6=24 marks)**

**IV. Answer any two of the following.**

32. Write a note on DNA diagnostics of genetic disorders.

33. Explain the techniques for cancer diagnostics.

34. Explain DNA typing and its significance in forensic sciences.

35. Describe various techniques used for viral disease diagnostics. **(15×2=30 marks)**

**SIXTH SEMESTER B Sc BIOTECHNOLOGY DEGREE**

**PRACTICAL EXAMINATION, NOVEMBER 2015.**

**BT6B23U - ENVIRONMENTAL BIOTECHNOLOGY AND PLANT BIOTECHNOLOGY**

**Time: 2 days (9.30 am – 4.00 pm) Total Marks: 80**

1. Perform bacteriological analysis of the given water sample and report its quality (SPC) **(15 marks)**

 (Principle – 3, Procedure – 4, Performance – 5, Result – 2, Interpretation – 1)

2. Determine the potability of provided water sample by MPN technique. **(15 marks)**

 (Principle – 3, Procedure – 6, Performance -3, Result – 2, Interpretation – 1)

3. Demonstrate the surface sterilization and inoculation of the given explants. **(10 marks)**

 (Surface sterilization – 5, Inoculation – 5)

4. Estimate the dissolved oxygen (DO) of the given water sample. **(10 marks)**

 (Principle – 2, Procedure – 3, Calculation – 2, Result – 2, Interpretation – 1)

5. Explain the steps involved in transfer of plantlets to greenhouse /field. **(5 marks)**

 (Principle – 1, Procedure – 4)

6. Identify and comment on (a. -------, b. -------, c. -------, d. -------, e. -------) **(10 marks)**

 (2 marks each; Identification –1, Comment (two valid points) – 1)

7. Record **(5 marks)**

8. Viva **(10 marks)**