



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY**

THIRD SEMESTER – NOVEMBER 2015

**BT 3824 - NANOTECHNOLOGY & MEDICAL BIOTECHNOLOGY**

Date : 07/11/2015

Dept. No.

Max. : 100 Marks

Time : 09:00-12:00

**PART – A**

**Answer ALL the Questions**

**(20 Marks)**

**I. Choose the correct answer**

**(5 x 1 = 5)**

- Who coined the term nanotechnology?  
a) Drexler                      b) Taniguchi                      c) Feynman                      d) Bohr
- Choose a bottom up method from the following  
a) Plasma arcing                      b) UV lithography                      c) Sol gel                      d) Ball milling
- Which disease is caused due to *CFTR* gene mutations?  
a) Alzheimer's                      b) Cancer                      c) Parkinson's                      d) Cystic fibrosis
- Aminocentesis can be performed in \_\_\_\_\_ weeks of pregnancy  
a) 16                      b) 18                      c) 24                      d) 36
- Which is the most important domain of *p53* gene?  
a) DNA binding                      b) Oligomerization                      c) C- Terminal                      d) N-Terminal

**II. State whether the following are true or false, if false, give reason**

**(5 x 1 = 5)**

- Young's moduli of nanoparticles are very less.
- Nanodots cannot be used for solar panels.
- Primary Congenital Glaucoma is an autosomal dominant disorder of the eye.
- Arythmia can be corrected by fetal surgery.
- BRCA1* gene mutations can cause ovarian cancer.

**III. Complete the following**

**(5 x 1 = 5)**

- Evanescent waves works on the principle of \_\_\_\_\_.
- Dip pen lithography makes use of \_\_\_\_\_ microscopy.
- The major gene involved in obesity is \_\_\_\_\_.
- \_\_\_\_\_ disease can be corrected by fetal surgery.
- \_\_\_\_\_ gene is called as the "Gaurdian of the Genome".

**IV. Answer the following, each within 50 words**

**(5 x 1 = 5)**

- What are quantum nanodots?
- Give an example for biologically inspired nanomaterial.
- Define gene therapy.
- What is DNA Fingerprinting?
- Define oncogene. Give two examples.

## PART B

Answer the following, each within 500 words.

(5 x 8 = 40 marks)

Draw diagram wherever necessary

21. (a) Illustrate scanning near field microscopy.

**OR**

(b) Explain about nanosphere lithography.

22. (a) Discuss the social and ethical issues of nanotechnology.

**OR**

(b) Enumerate the applications of nanoparticles in reducing energy consumption.

23. (a) Discuss various types of Schizophrenia phenotypes.

**OR**

(b) Enumerate the various indicators of genetic counselling.

24. (a) Explain Chorionic Villus Sampling diagrammatically.

**OR**

(b) Describe DNA fingerprinting diagrammatically.

25. (a) Discuss three types of familial hereditary cancers.

**OR**

(b) Explain *In situ* hybridization diagrammatically.

## PART – C

Answer any TWO of the following, each within 1500 words.

(2 x 20 = 40 Marks)

Draw diagrams wherever necessary.

26. Describe about any two scanning probe microscopic techniques in detail.

27. Elaborate on proteins as drug delivery vehicles and their synthesis and loading of drugs.

28. Explain various types of diabetes, complications associated with type 2 diabetes and its management.

29. Discuss the following

i. Molecular basis of Retinoblastoma in sporadic and familial cases with diagrams.

ii. Fetal disorders and its available therapies

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