LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – BIOTECHNOLOGY

THIRD SEMESTER – NOVEMBER 2015

BT 3955 - MOLECULAR PATHOLOGY

Date : 13/11/2015   Dept. No.   Max. : 100 Marks
Time : 09:00-12:00

PART – A

Answer ALL the Questions

I. Choose the correct answer   **(5 x 1 = 5)**

1. Which enzyme is involved in the shortening of telomere?
   a) DNA Pol I   b) RNA Pol I   c) Telomerase   d) Catalase

2. What is the size of human mitochondria in Kb?
   a) 10   b) 20   c) 16.5   d) 5

3. Which of the following is a "Prion" disease?
   a) Kuru   b) Cancer   c) Hypertension   d) Diabetes

4. Which gene is associated with obesity?
   a) *FTO*   b) *HNF*   c) *VGF*   d) *TC7L*

5. What % of drugs are detoxified by CYP2D6 enzyme?
   a) 50   b) 75   c) 25   d) 90

II. State whether the following are true or false, if false, give reason   **(5 x 1=5)**

6. *ATP1* is an example of a mitochondrial gene.
7. Acetylation is a genetic imprinting phenomenon.
8. Chaperones are involved in the misfolding of the proteins.
9. Hepatocytes do not have regeneration potential.
10. Fast metabolizers require less dose of drug compared to ultra fast metabolizers of drug.

III. Complete the following   **(5 x 1= 5)**

11. Accumulation of ROS (Reactive Oxygen Species) can cause _____ _____
12. "UPD" stands for _____
13. Dr. Stanley Prusiner was a Nobel Prize winner for the discovery of _____
14. Increase in _____ cholesterol causes atherosclerosis.
15. "Proguanil" drug is used for the treatment of _____ disease.

IV. Answer the following, each within 50 words   **(5 x 1 = 5)**

16. Mention the function of telomere.
17. Define epigenetics.
18. What is pattern formation?
19. Expand MODY. Which is the most commonly seen MODY phenotype in India?
20. What is the function of Cytochrome P450 gene (*CYP450*)?

PART B

Answer the following, each within 500 words. (5 x 8 = 40)

Draw diagrams wherever necessary

21. (a) Explain the molecular mechanisms involved in the repair of oxidative DNA damage.

OR

    b) Discuss the role of telomerase in aging.

22. (a) What are the clinical features of human mitochondrial DNA mutations in adults?

OR

    (b) Explain genome imprinting and Angelman syndrome.

23. (a) Enumerate the differences between bacterial and viral infections.

OR

    (b) Discuss the genes involved in Pattern formation.

24. (a) Describe the molecular basis of Ischemic Heart Disease (IHD) with diagrams.

OR

    (b) Explain the gene - environment involvement in the causation of

      type 2 diabetes with a flow chart.

25. (a) Schematically show the various stages involved in the metabolism of a drug.

OR

    (b) Distinguish between Pharmacogenetics and Pharmacogenomics.

PART – C

Answer any TWO of the following, each within 1500 words. (2 x 20 = 40)
Draw diagrams wherever necessary.

26. Describe the role of oxidative DNA damage in disease development.

27. Explain in detail pattern recognition receptors and inflammatory response.

28. Describe atherosclerosis with suitable diagrams.

29. Discuss the role of Cytochrome P450 gene in drug metabolism with at least two examples.

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