

SARDAR PATEL UNIVERSITY

Ph.D Entrance Test

Date: 8-8-2014

Time: 3 hours

Total Marks: 100

Subject: Medical Technology

Notes:

1. All questions are compulsory
2. Figures towards the right indicate marks
3. Encircle the correct answers in the MCQs

Section-I

Q.1 Write briefly on the following:

5x2=10

- (a) Fatty liver
- (b) Post-translational modifications
- (c) Enzymes required for DNA replication
- (d) Folate trap
- (e) Sickle cell disease

Section II MCQs (in Separate sheets)

40

Section-III

Write short notes on:

5X5=25

- (a) Purine catabolism and salvage pathways
- (b) Oxidation of fatty acids and ketogenesis
- (c) Gluconeogenesis from lactate and its regulation
- (d) DNA recombinant technology with applied use
- (e) HMP shunt pathway and its significance

Section- IV

Describe how blood glucose is regulated. Give a detailed account of different types of Diabetes mellitus, accompanying metabolic alterations, acute and chronic complications and its lab diagnosis:

25

SECTION-II Multiple choice questions:

40

Note: Encircle the correct answer

1. The action of one of the following enzymes generates GTP:
 - a. Succinate thiokinase
 - b. Phosphofructokinase
 - c. 3 phosphoglycerate kinase
 - d. Pyruvate kinase
 2. One of the following enzymes does not produce $\text{NADH} + \text{H}^+$:
 - a. Isocitrate dehydrogenase
 - b. Alpha-ketoglutarate dehydrogenase
 - c. Malate dehydrogenase
 - d. Succinate dehydrogenase
 3. One of the following is not true for TCA cycle:
 - a. Takes place in cytoplasm.
 - b. Amphibolic pathway
 - c. Related to gluconeogenesis
 - d. Common to fat, protein and carbohydrate metabolism
- Q.4** One of the following is wrong for RBC glycolysis:
- a. The end product is lactate
 - b. 2, 3 BPG is formed
 - c. Less ATP formed
 - d. Aerobic glycolysis is present
5. The rate limiting enzyme of cholesterol is:
 - a. HMG CoA synthase
 - b. HMG CoA reductase
 - c. HMG CoA lyase
 - d. HMG CoA dehydrogenase

6. The No. of NADH+ H + moles produced in glycolysis from one mole of glucose is
1. Two
2. Four
3. One
4. None of the above
7. NADH is produced in one of the following reactions
a. Glyceraldehyde 3 phosphate dehydrogenase
b. Pyruvate kinase
c. Hexokinase
d. Aldolase
8. One of the following statements does not pertain to HMP shunt pathway
a. Necessary for Lipogenesis
b. Necessary for steroidogenesis
c. Necessary for nucleic acid synthesis
d. Necessary Glycogenesis
9. HMP shunt pathway is very active in the following tissues except :
a. Adipose tissue
b. Lactating mammary gland
c. Adrenal cortex
d. Brain
10. The coenzyme used in HMP pathway is
a. NADP
b. NAD
c. FAD
d. Biotin
11. One of the following is not a lipid storage disorders
a. Nieman pick's disease
b. Taysachs disease
c. Wilson's disease
d. Gauchers disease
12. Short chain and medium chain fatty acids are less in
a. Coconut oil
b. Butter
c. Ghee
d. Red meat
13. Uncontrolled diabetes mellitus may result in
a. Metabolic acidosis
b. Metabolic alkalosis
c. Respiratory acidosis
d. Respiratory alkalosis
14. Ammonia production for regulating acid base balance takes place in
a. Liver
b. Kidneys
c. Lungs
d. None of these

15. One of the following is not a branched chain amino acid
 - a. Valine
 - b. Leucine
 - c. Isoleucine
 - d. Alanine
16. One of the following is not an essential amino acid
 - a. Tyrosine
 - b. Phenylalanine
 - c. Methionine
 - d. Tryphophan
17. One of the following is an essential amino acid
 - a. Lysine
 - b. Aspartic acid
 - c. Glutamic acid
 - d. Tyrosine
18. One of the following pair is said to be semi essential
 - a. Aspartate & Glutamate
 - b. Arginine & Histidine
 - c. Phenyl Alanine & tyrosine
 - d. Leucine & Isoleucine
19. Essential amino acid means
 - a. Indispensable
 - b. Dispensable
 - c. More important
 - d. None of these
20. Glutathion is
 - a. γ - Glutamyl cysteinyl glycine
 - b. α - Glutamyl cysteinyl glycine
 - c. Lysyl cysteinyl glycine
 - d. None of these
21. One of the following diseases does not exhibit abnormal oxidation of fatty acids
 - a. Refsum's disease
 - b. Zell wagers disease
 - c. Ketosis due to diabetes mellitus
 - d. Nieman pick disease
22. One of the following is due to defective protein targeting
 - a. Zell wagers disease
 - b. Alzheimer's disease
 - c. Prion disease
 - d. Porphyrias
23. One of the following is not related to either fatty acid oxidation or fatty synthesis
 - a. Thiolase
 - b. Thioesterase
 - c. ACP
 - d. Aldolase

24. One of the following does not produce any ATP
- Glycolysis
 - TCA cycle
 - Beta Oxidation of fatty acids
 - Alpha oxidation of a fatty acids
25. One of the following enzymes bring about substrate level phosphorylation
- Glucokinase
 - Succinate Thiokinase
 - Phosphofructo kinase
 - Pyruvate Dehydrogenase
26. One of the following is not an example of substrate level phosphorylation
- Phosphoglycerate kinase
 - Succinate thiokinase
 - Pyruvate kinase
 - Phosphorylase kinase
27. One of the following is not an anabolic process
- Glycogenesis
 - Lipogenesis
 - Purine synthesis
 - Uric acid formation
28. One of the following is not an enzyme of cholesterol metabolism
- Acetoacetyl CoA synthase
 - HMG CoA synthase
 - HMG CoA reductase
 - HMG CoA lyase
29. One of the following is not synthesized from cholesterol
- Vitamin – D
 - Vitamin – A
 - Bile salts
 - Estrogen
30. One of the following lipoproteins is found to be more in Indians
- LDL
 - HDL
 - Lipoprotein “a”
 - VLDL
31. One of the following does not pertain to free radicals
- Causes damages to DNA
 - Protects biomolecules
 - Have unpaired electrons in the outer orbit
 - Might cause cataract
32. One of the following is an antioxidant enzyme
- Carotene
 - Super oxide dismutase
 - Ascorbic acid
 - Tocopherol
33. Beta oxidation of one of the following forms propionyl CoA
- odd number carbon chain fatty acid
 - Long chain fatty acid
 - Even number carbon chain fatty acid
 - None of these

34. Red blood cells are red in color because they contain
- Iron
 - Folic acid
 - Vitamin B 12
 - Vitamin D
35. Which is the routine stain for histopathological sections ?
- Haematoxylin and eosin
 - PAP stain
 - Romanowsky's stain
 - Giemsa stain
36. RBCs normally survive in blood for about _____ days.
- 120
 - 130
 - 140
 - 150
37. _____ is not transfusion transmitted disease.
- Malaria
 - Hepatitis E
 - Syphilis
 - Hepatitis B
38. The most common genetic mechanism for transfer of drug resistance is through
- Insertion sequence
 - Bacteriophages
 - Plasmids
 - Conjugative plasmids
39. Bacteria whose optimal temperature for growth is 37° C are known as :
- Mesophiles
 - Psychrophiles
 - Thermophiles
 - Autophiles
40. Exposure of material to steam at 100 °C for 20 minutes on three consecutive days is known as :
- Inspisation
 - Autoclaving
 - Pasteurization
 - Tyndallisation