[186] SEAT No._____ No. of Printed Pages : 9

SARDAR PATEL UNIVERSITY
M.Sc. (II-SEMESTER) Examination (CBCS)
THURSDAY, 28th March, 2019
2:00 to 5:00 pm
M.Sc. Biochemistry
PS02EBIC22: MEDICAL BIOCHEMISTRY

TOTAL MARKS: 70

Q.1 Tick mark / select the correct answer for the following. (*Only correct option against given question number needs to be written in provided answer book*) **(08 Marks)**

1. Which of the following serum Isoenzyme of LDH predominantly increased in patient with acute viral hepatitis?
   a. LDH - 5
   b. LDH - 4
   c. LDH - 2
   d. LDH - 1

2. During pancreatitis, the elevated enzyme(s) is / are
   a. Amylase
   b. Aldolase
   c. Lipase
   d. Both (a) and (b)

3. Which neurotransmitters are involved in epilepsy?
   a. GABA and Dopamine
   b. Norepinephrine and GABA
   c. GABA and Serotonin
   d. Norepinephrine and Serotonin

4. The patients suffering from which of the following disease will show increased resistance to malaria:
   a. Cholera
   b. Hypercalcemia
   c. Hypophosphatemia
   d. Sickle cell anaemia

5. Crigler-Najjar Syndrome is the inherited metabolic disorder of Bilirubin metabolism due to defective enzyme
   a. UDP-Glucouronyl transferase
   b. Heme oxygenase
   c. Biliverdin reductase
   d. Beta-glucuronisase

6. In the patient's gastric analysis shows absence of free acid at all, the probable condition is:
   a. Hyperacidity
   b. Hypoacidity
   c. Achlorhydria
   d. All of the above

7. Which of the following is present in the cell wall of Mycobacterium renders the acid fast characteristic:
   a. Mycolic acid
   b. Murein
   c. Lipoarabino Mannan
   d. Lipo techoic acid

8. The simplest microbial interaction, an association of two or more different species of organisms, is called
   a. Parasitism
   b. Symbiosis
   c. Predation
   d. Competition

(P.T.O.)

Q.2 Answer **any seven** from the following: **14**

a) State the importance of Vitamin A in vision.
b) Briefly explain serum enzyme used in GI tract diseases with the clinical importance.
c) Write down the causes of hyperphosphatemia.
d) Categorize water soluble and fat-soluble vitamins. Discuss the dietary source and clinical importance of vitamin D
e) Briefly describe the disorders of sleep.
f) What are opportunistic microorganisms? Name any three of them.
g) List the various thyroid function tests used for the diagnosis of thyroid disorders.
h) Describe any four modes of transmission of infection.
i) Define hypertension. What is difference between of diastolic and systolic blood pressure?

Q.3 (A) State the physiological significance of calcium. Discuss the various factors responsible for regulation of calcium level. **6**

(B) What are cardiac biomarkers? Describe the site, normal values and clinical feature of different markers used during acute myocardial infarction. **6**

OR

(B) Explain the term, 'isoenzyme'. Citing suitable examples describe the isoenzymes of any one enzyme which holds significance in medical biochemistry. **6**

Q.4 (A) Write a short note on 'Jaundice and its types'. **6**

(B) Discuss the mechanism of formation of bilirubin pigment from hemoglobin. How bilirubin gets conjugated in liver. **6**

OR

(B) Classify the various kidney function tests. Describe urea clearance test in detail. **6**

Q.5 (A) Describe the mechanism involved in development of different stages of atherosclerosis and add a note on any two risk factors. **6**

(B) Enlist various neurological disorders and discuss the different types of epilepsy and its mechanism in detail. **6**

OR

(B) What is carcinogenesis? Explain the role of various oncogenes and tumor suppressor gene in development of cancer. **6**

Q.6 (A) Describe the mode of transmission, pathogenesis and diagnostic tests for pulmonary tuberculosis. **6**

(B) Describe the pathogenesis of cholera with special reference to genetic organization and regulation of virulence factors in *vibrio cholerae* **6**

OR

(B) Enlist host microbes interactions and explain any two interactions in human host **6**

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SC

SARDAR PATEL UNIVERSITY
M.Sc (I Semester) Examinations (NC)
Friday, 22nd March, 2019
10.00 am to 1.00 pm
PS01CBIC22 – Bioinstrumentation

Total marks: 70

1. Choose the correct answers. (08)

i) Which of the following method separates biomolecules based on size?
   a) Gel permeation chromatography
   b) Gas chromatography
   c) Paper chromatography
   d) all the above

ii) Which of the following techniques is the most suitable for detecting radioisotopes?
   a) Infrared spectroscopy
   b) Scintillation counting
   c) NMR spectroscopy
   d) AAS

iii) The wavelength of an absorption is 495 nm. In what part of the electromagnetic spectrum does this lie?
   a) Ultraviolet-visible
   b) infrared
   c) Microwave
   d) radiowave

iv) For X-ray crystallographic studies the sample should be in the form of
   a) Liquid
   b) Semisolid
   c) Gas
   d) Crystal

v) You want to determine the location of a specific substance based on birefringence. Which of the following is the best technique for this purpose?
   a) electron microscopy
   b) phase contrast microscopy
   c) bright-field microscopy
   d) polarization microscopy

vi) Which of the following techniques can help to separate biomolecules based on density?
   a) Centrifugation
   b) Scintillation counting
   c) Spectroscopy
   d) microscopy

vii) The separation of charged molecule based on pH gradient is known as
   a) Isoelectro focusing
   b)Dot plot technique
   c) native gel electrophoresis
   d) None of the above

viii) In normal phase chromatography_____ are used
   a. Polar stationary phase and non-polar mobile phase
   b. Non-polar stationary phase and polar mobile phase
   c. Polar stationary phase and polar mobile phase
   d. Non-polar stationary phase and non-polar mobile phase

2. Attempt any **any seven**: **(7 x 2 = 14)**

a. Define: depth of focus
b. Define: hydrodynamic focusing
c. SDS-PAGE
d. Write a brief note on columns used in Gas chromatography.
e. Why quartz cuvette is used in UV sepectroscopy?
f. Define: molar absorptivity
g. What is a photodiode?
h. Define: fluors
i. What are parent ions and fragment ions?

3. a) Briefly explain the functioning of SEM. (06)
b) Explain the instrumentation of Fluorescence microscope (06)

OR

b) Explain the types of oculars. (06)

4. a) Explain the detectors used in HPLC. (06)
b) Describe the process of differential centrifugation. (06)

OR

b) Discuss the principle and applications of GC. (06)

5. a) Explain the working of photomultiplier tube in detail (06)
b) Explain the instrumentation and application of IR spectroscopy. (60)

OR

b) Outline the principle and uses of solid scintillation counting. (06)

6. a) Explain quadrupole analyzer in mass spectroscopy. (06)
b) Write a brief note on autoradiography (06)

OR

b) Explain NMR spectroscopic technique in brief. (06)

Sc

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Sardar Patel University
M. Sc. (II Semester) Examination
Saturday, 23rd March, 2019, 2.00 p.m. to 5.00 p.m.
Microbiology/Biochemistry/Biotechnology
PS02CMIC/BIC/BIT23 – Fundamentals of Immunology

Total marks: 70

Q.1 Select the right/most appropriate answer for the following: (08 marks)

A. Complement fixation pathway involving soluble C3 convertase is
   a. Alternative
   b. Classical
   c. MBL
   d. All of the above

B. The plasma cells residing in Peyer's patches secrete -------- immunoglobulin molecules.
   a. IgG
   b. IgM
   c. IgA
   d. IgD

C. Which of the following is most effective antigen presenting cell?
   a. Macrophage
   b. Dendritic cell
   c. B cell
   d. None of the above

D. Chloroquine treatment blocks exogenous antigen processing as
   a. It blocks protein synthesis
   b. It blocks TAP function
   c. It disrupts the Golgi appratus
   d. It blocks decrease in lysosome pH

E. Ability of two or more cytokines to mediate similar function is
   a. Antagonism
   b. Redundancy
   c. Synergy
   d. Pleotropy

F. Expression of single specificity IgM and IgD on naïve B cells is because of
   a. Class switching
   b. Allelic exclusion
   c. Somatic hyper mutation
   d. All of the above

G. Cytokines functioning through GPCR are
   a. TNFs
   b. Chemokines
   c. INFs
   d. Hematopoietin

H. Role of phagocytosis in host defense was first reported by
   a. Jules Bordet
   b. Elie Metchnikoff
   c. Louis Pasteur
   d. Susumu Tonegawa

(P.T.O.)

Q.2 Answer/attempt **any seven** from the following: (14 marks)

a) What is immunoglobulin domain?
b) Differentiate bacterial septic shock and bacterial toxic shock.
c) Explain role of adjuvants.
d) Explain class switching.
e) Write on opsonins and opsonization.
f) Why antibodies against ABO blood group are examples of cross reacting antibodies?
g) What is the strategy of immune system to kill intracellular bacterial pathogens?
h) Why RIA is considered as competitive assay?
i) What are collectins and what is their role?

Q.3 A. Discuss generation of inflammatory response upon pathogen entry and its clearance from the host tissues. (06 marks)

B. Explain the role of PAMPs and PRRs in innate immune system citing suitable examples. (06 marks)

OR

B. Discuss structural features of the organ involved and generation of humoral immune response to antigens injected in the blood. (06 marks)

Q.4 A. Discuss classical pathway of complement activation and its regulation. (06 marks)

B. Briefly discuss the mechanisms leading to generation of antibody diversity during rearrangement of variable region genes of light chain. (06 marks)

OR

B. Explain how a B cell produces different classes of Ig molecules having same specificity at different stages of immune response. (06 marks)

Q.5 A. Discuss pathway for processing of exogenous antigens and its loading on to MHC molecule. (06 marks)

B. Write note on therapeutic applications of cytokines. (06 marks)

OR

B. Discuss in details signal transduction mediated by INFs and how they help in generation of antiviral state. (06 marks)

Q.6 A. Write on different types of ELISA and their applications. (06 marks)

B. Write a note on immunity to viral infections. (06 marks)

OR

B. Write on NK cells and their role in immune system. (06 marks)

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