Subject: Biochemistry & Metabolism

Full Marks: 60

Time: 3 Hours

Course:Biotechnology

Pass Marks: 24

- Candidates are required to give their answers in their own words as far as practicable.
- Question Paper is divided into **Three Parts –A,B& C**
- **Part-A** is compulsory.
- **Part- B** contains **FIVE** questions out of which **FOUR** questions are to be answered.
- **Part- C** contains **FOUR** questions out of which **TWO** questions are to be answered.

PART A

Q.1) **All questions are compulsory**

A] Multiple Choice Questions: (10x1=10)

a) Molecules that bear charged groups of opposite polarity are known as?
  i) Zwitterions
  ii) Ambions
  iii) Ion conversion
  iv) Amphions

b) A nucleotide consists of?
  i) a sugar, a base and a phosphate
  ii) a sugar and a phosphate
  iii) paired bases
  iv) a sugar, a base and three phosphates

c) An essential amino acid is one that
  i) is essentially easy to synthesize
  ii) is essential to flagella motion
  iii) the body cannot synthesize
  iv) the body can synthesize at optimum condition

d) Which of the following is found on RNA but not DNA?
  i) Adenine
  ii) Uracil
  iii) Guanine
  iv) Cytosine

e) A buffer solution comprises which of the following?
  i) A weak acid in solution
  ii) A strong acid in solution
  iii) A weak base in solution
  iv) A weak acid and its conjugate base in solution

f) Protein component of enzyme is called
  i) Cofactor
  ii) Coenzyme
  iii) Activator
  iv) Apoenzyme

g) Which of the following character does not apply to water?
   i)   The water molecule is asymmetric
   ii)   The water molecule readily forms hydrophobic interactions
   iii)   The covalent bonds in water are highly polarized
   iv)   All three atoms in the water molecule readily form hydrogen bonds

h) Which of the following indicates that the pK of an acid is numerically equal to the pH of the solution when the molar concentration of the acid and its conjugate base are equal?
   i)   Michaelis-Menten equation
   ii)   Haldanes equation
   iii)   Henderson-Hasselbalch equation
   iv)   Hardy-Windberg law

i) Beta pleated sheets are examples of protein's
   i)   primary structure
   ii)   secondary structure
   iii)   tertiary structure
   iv)   quaternary structure

j) The released energy obtained by oxidation of glucose is stored as
   v)   a concentration gradient across a membrane
   vi)   ATP
   vii)   NAD+
   viii)   ADP

B] Very Short question   (5x2=10)

   a) Ramachandran plot
   b) Epimers
   c) Proton hopping
   d) Enzyme
   e) Glycosidic bond

PART B

Q.2)Answer any Four: (4x5=20)

   a) Describe the forces that stabilize the tertiary structure of proteins.

   b) Whatis enzyme. Write the properties of enzyme.

   c) Describe the non-competitive inhibition with example.

   d) What is amino acid? Describe the classification of amino acid with suitableexamples.

   e) Describe the chemistry and functions of phospholipids.

PART C

Q.3) Write the reaction sequence of β-oxidation of saturated even number fatty acids.

Q.4) Describe in detail the double helix structure of DNA? Write difference between A, B and Z form of DNA.

Q.5) Name the various pathways for glucose metabolism. Give in detail the tricarboxylic acid cycle and mention its regulatory points.

Q.6) What is carbohydrate? Write the functions and classification of carbohydrate.

ARKA JAIN University, Jharkhand

1st Semester Final Examination – 2018-19

Subject: Biochemistry & Metabolism practical
Full Marks: 40
Time: 2 Hours

Course: Biotechnology
Pass Marks: 16

Q.1) Describe and perform the separation of amino acid by radial paper chromatography. **(Marks = 10)**

Or

What is Buffer? Describe and prepare the Phosphate buffer.

Q.2) Calculate the volume from the 10N NaOH stock solution to prepare 100ml of 1N NaOH solution. **(Marks = 5)**

Q.3) A student prepared glucose and cellulose solution in two separate test tube. But unfortunately forgot to label them. Describe the method to identify glucose and cellulose solution. **(Marks = 5)**

Q.4) Spotting **(Marks = 10)**

Q.5) Viva **(Marks = 5)**

Q.6) Practical note book **(Marks = 5)**

Subject: Cell Biology

Course :Biotechnology
Full Marks: 60
Pass Marks: 24

Time: 3 Hours

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- Question Paper is divided into **Three Parts –A,B& C**
- **Part-A** is compulsory.
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- **Part- C** contains **FOUR** questions out of which **TWO** questions are to be answered.

PART A

Q.1) **All questions are compulsory**

A] **Multiple Choice Questions:**   (10x1=10)

a) The term mitochondria was given by
   - i)   Carl Benda
   - ii)   W. Waldeyer
   - iii) Robert hook
   - iv)   Anton Van Leeuwenhoek

b) Microfilament is made up of
   - i)   tubulin
   - ii)   actin
   - iii) both of above
   - iv)   None of the

c) Site of ribosome synthesis is
   - i)   Cytoplasm
   - ii)   Endoplasmic reticulum
   - iii) Nucleolus
   - iv)   Mitochondria

d) The function of cristae in a mitochondrion is
   - i)   electron transport and ATP synthesis
   - ii)   carbon assimilation
   - iii) intake of O_2
   - iv)   elimination of CO_2

e) Cellular organelle contain hydrolytic enzymes is called?
   - i)   Peroxisome
   - ii)   Lysosome
   - iii) Ribosome
   - iv)   Mesosome

f) Extra nuclear DNA is found in
    i)   Chloroplast
    ii)   Mitochondria
    iii)   Both of the above
    iv)   Endoplasmic reticulum

g) The main function of Centrosome is
    i)   Secretion
    ii)   Osmoregulation
    iii)   Protein synthesis
    iv)   Formation of spindle Fibre

h) Transport is a main function of
    i)   Plasma membrane
    ii)   Lysosome
    iii)   Golgi complex
    iv)   Ribosome

i) Programmed cell death is called as
    i)   apoptosis
    ii)   cell lysis
    iii)   necrosis
    iv)   cell ageing

j) The subunit of prokaryotic ribosome are
    v)   60S + 40S
    vi)   70S + 40S
    vii)   60S + 30S
    viii) 50S + 30S

B] Very Short question   (5x2=10)

a) Active transport
b) Cell theory
c) Cancer
d) Rough Endoplasmic reticulum
e) Papillomaviruses

PART B

Q.2)Answer any Four: (4x5=20)

i)   Explain the Fluid Mosaic model of plasma membrane with labeled diagram.

ii) Write the five properties of cancerous cell.

iii) Write notes of

    a) Tight junctions and

    b) Desmosomes

iv) Write differences betweenMicrotubules and Microfilaments.

v)   Write the functions of endoplasmic reticulum.

PART C

Answer any two: (2x10=20)

Q.3) What is cell surface receptors? Define in detail MAPK signal transduction pathway.

Q.4) Write about the various active transport systems with a suitable example.

Q.5) Write the structure and functions of Golgi complex.

Q.6) Write in detail reducing agents NADH able to generate the free-energy currency molecule (ATP)?

ARKA JAIN University, Jharkhand

1st Semester Final Examination – 2018-19

Subject : Cell Biology Practical   Course : Biotechnology

Full Marks : 40   Pass Marks : 16

Time: 2 Hours

Q.1) Describe and perform the mitosis in onion root tip.   **(Marks = 10)**

Or

Describe and perform the plasmolysis and deplasmolysis using Rhoeo plant leave.

Q.2) Answer these questions   **(Marks = 2.5x4=10)**

a) Difference between prokaryotic and eukaryotic cell.

b) Metaphase

c) Fixation

d) Plasmolysis

Q.3) Spotting   **(Marks = 10)**

Q.4) Viva   **(Marks = 5)**

Q.5) Practical note book   **(Marks = 5)**