Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Sc. (H), (BT/Genetics/MolBio/MicroBio)/SEM-2/OMB-201/2011

2011

ORGANIC MECHANISMS IN BIOLOGY

Time Allotted : 3 Hours *Full Marks :* 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

   i) An enzyme found in the liver but not in the skeletal muscle is

      a) glycogen phosphorylase

      b) lactate dehydrogenase

      c) hexokinase

      d) glucose-6-phosphatase.

   ii) Conversion of 2-phosphoglycerate to phosphoenol pyruvate requires

      a) phosphoglycerate kinase

      b) aldolase

      c) pyruvate kinase

      d) enolase.

iii) Major site for purine synthesis is

a) muscle b) liver

c) kidney d) none of these.

iv) 2, 4-Dioxpyrimidine is

a) thymine b) cytosine

c) uracil d) guanine.

v) ..... enzyme is required for the hexose monophosphate shunt pathway.

a) Glucose-6-phosphatase

b) Phosphorylase

c) Aldolase

d) Glucose-6-phosphate dehydrogenase.

vi) SCID is most often caused by a deficiency in the enzyme

a) adenosine deaminase (ADA)

b) adenine phosphoribosyltransferase

c) PRPP synthetase

d) IMP synthase.

vii) Alcohol dehydrogenase from liver contains

a) Sodium b) Copper

c) Zinc d) Magnesium.

viii) All mammalian steroid hormones are formed from

a) Purine b) Pyrimidine

c) Cholesterol d) Pyrrole.

ix) A component of the respiratory chain in mitochondria is

a) Coenzyme *Q*

b) Coenzyme *A*

c) Acetyl coenzyme

d) Coenzyme containing thiamine.

x) Uric acid normally present in human system as

a) Mono-sodium urate b) Mono-potassium urate

c) di-sodium urate d) di-potassium urate.

xi) What is the primary source of DNA in your mitochondria ?

a) Father b) Mother

c) Both d) None of these.

xii) The regulatory mechanism of body water is influenced by the hormone

a) Oxytocin b) ACTH

c) FSH d) Epinephrine.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Catabolism of purine nucleotides produce uric acid. Illustrate.

3. Write notes on β-oxidation of fatty acid.

4. Discuss transamination reaction.

5. What do you mean by non-standard amino acid ? Why does the concentration of ketone bodies in the blood increase during prolonged starvation ? 2 + 3

6. What are the differences between reversible and irreversible inhibitors of enzyme ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. Distinguish between nucleosides and nucleotides. What is the difference between de novo and salvage pathway ? How is IMP produced from PRPP ? Mention the different enzymes involved in the synthesis. What is the major site of purine synthesis ? How IMP gets converted to AMP and GMP ? $2 + 2 + 7 + 1 + 3$

8. Describe in brief, different steps in glycolysis mentioning the different enzymes. Discuss about different regulatory steps in glycolysis. Which one is the major regulating step ? What is anaerobic alcoholic fermentation ? How lactic acid is formed from pyruvate in the muscle ? $7 + 4 + 1 + 1\frac{1}{2} + 1\frac{1}{2}$

9. What is oxidative deamination ? Discuss with example. Discuss urea cycle. What are essential and non-essential amino acids ? Give examples. Write the structure of Arginine and Tyrosine. $4 + 6 + 3 + 2$

10. What are hormones ? Discuss their chemical nature. Write the structure of cyclic AMP. What is second messenger system ? Describe in brief, the mechanism of hormone action on the membrane receptors and elaborate on the role of cyclic AMP. $1 + 2 + 2 + 4 + 6$

11. How are catecholamines produced from their precursor molecule ? Which amino acid is responsible for hormone production ? Describe the production pathway. Write short note on Black urine disease. $6 + 4 + 5$