BIOLOGICAL CONTROL SYSTEMS (SEMESTER - 8)

CS/B.Tech(BME)/SEM-8/BME-803B/09

1. .....
Signature of Invigilator

2. .....
Signature of the Officer-in-Charge

Reg. No.

Roll No. of the Candidate

– –

CS/B.Tech(BME)/SEM-8/BME-803B/09

ENGINEERING & MANAGEMENT EXAMINATIONS, APRIL – 2009

BIOLOGICAL CONTROL SYSTEMS (SEMESTER - 8)

Time : 3 Hours] [Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
   b) For **Groups – B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

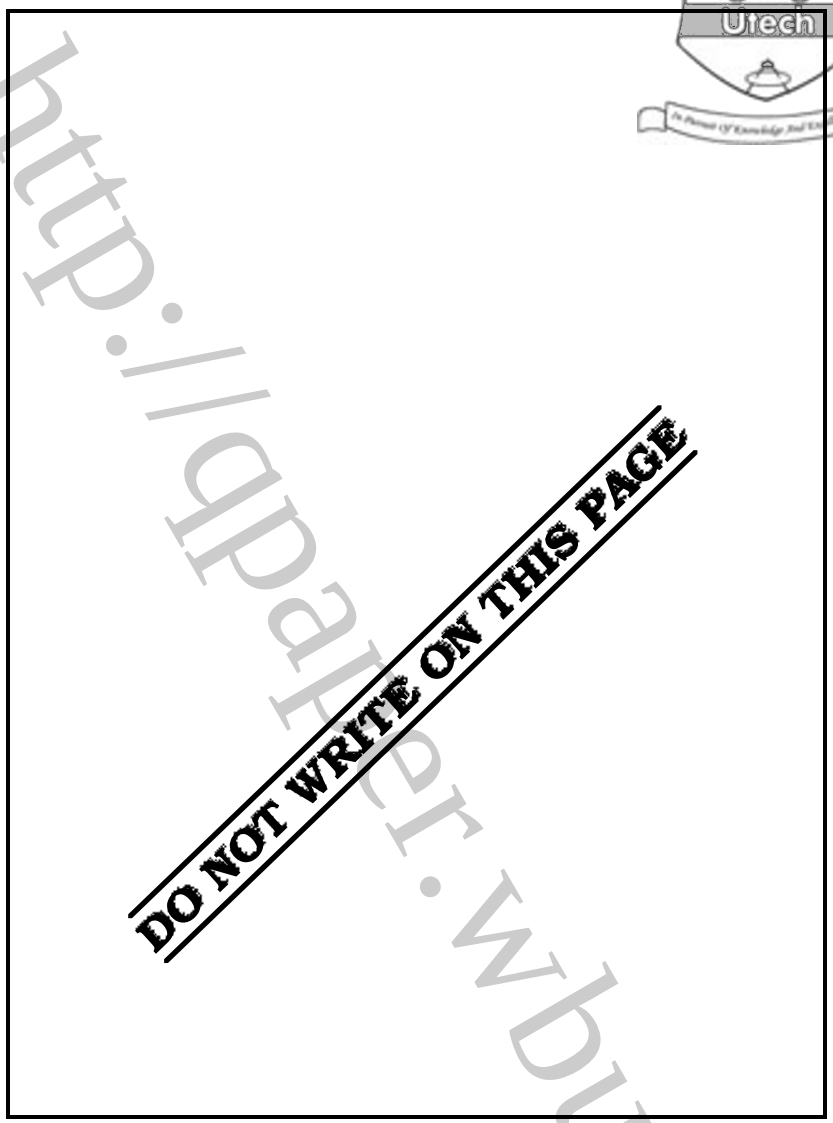
FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

	Group – A										Group – B			Group – C			*Total Marks*	*Examiner's Signature*
Question Number																		
Marks Obtained																		

.....
Head-Examiner/Co-Ordinator/Scrutineer

8888 B/D (27/04)



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GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

i) Design of the thermoregulatory processes in 'homeothermic' animal is an example of

a) closed loop system b) open loop system

c) both (a) and (b) d) none of these. ☐

ii) Affinity of haemoglobin to oxygen reduces as blood pH falls — this effect is known as

a) C – D – H effect b) Bohr effect

c) Krebs' effect d) Douglus effect. ☐

iii) The 'Renal threshold value' is

a) 120 mg of glucose / 100 ml blood

b) 500 mg of glucose / 100 ml blood

c) 210 mg of glucose / 100 ml blood

d) 180 mg of glucose / 100 ml blood. ☐

iv) Atrial natriuretic peptide controls blood pressure by correcting

a) hypervolemia b) hypovolemia

c) venous return d) peripheral resistance. ☐

v) When movement of substances occurs from higher to lower concentration but with the help of carrier and without any energy expenditure the process is called

a) secondary active transport b) endosmosis

c) facilitated diffusion d) exosmosis. ☐

vi) The anterior group of nuclei of hypothalamus is associated with the correction of

a) blood sugar level

b) blood pressure

c) blood pH

d) body temperature in homeothermic animal. ☐

vii) Regulation of CO_2 transport in blood by Hamburger phenomenon involves

a) bicarbonate ions b) sodium ions

c) chloride ions d) hydrogen ions. ☐

viii) At a pH of 7·8 life terminates in tetany due to

a) neuromuscular hyper excitability

b) reduced O_2

c) carrying capacity of Hb

d) hypervolemia

e) acidosis. ☐

ix) Glomerular filtration is favoured by

a) colloidal osmotic tension of the capillary blood

b) capillary hydrostatic pressure

c) hydrostatic pressure of Bowman's capsule

d) all of these. [ ]

x) Short term control of blood pressure is achieved via

a) Renin-angiotensin system b) neural mechanism

c) the activity of ANP d) all of these. [ ]

GROUP – B

(Short Answer Type Questions)

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

2. What are the similarities between biological control system and engineering control system ?

3. How is CO_2 uptake from tissue to blood regulated ?

4. What is the role of 'Sino-aortic reflex' in the biological control of blood pressure ?

5. How does 'Donnan effect' maintain equilibrium in body fluid compartments ?

6. Define closed loop system and open loop system with examples.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. How is body temperature in human regulated ?

8. Explain the role of various controlling factors which help in the uptake of O_2 in the lungs and dissociation of it in the tissues.

9. Describe the regulatory process of acid-base balance. Mention the role of buffer in this process. 9 + 6

10. Write the major role of 'counter current multiplier system' in the control of concentration of urine.

11. What are the effects of feedback on the system performance characteristics like stability, sensitivity, over all gain and bandwidth ? 4 + 4 + 4 + 3

12. What do you know about the endocrine control mechanism of 'blood sugar' ? Why is 'Liver' called 'glucostat' ? 12 + 3

END