U.G. 4th Semester Examination - 2021

CHEMISTRY

[PROGRAMME]

Skill Enhancement Course (SEC)

Course Code : CHEM-G-SEC-T-2(A-E)

Full Marks : 20   Time : 1 Hour

The figures in the right-hand margin indicate marks.

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

Answer all the questions from selected Option.

OPTION-A

CHEM-G-SEC-T-2(A)

(Clinical Biochemistry)

1. Answer any **five** questions: 1×5=5

    a) Name one non-reducing sugar. Why it is so called?

    b) What are the basic structural units of a protein?

    c) How cholesterol is significant in our system?

    d) What is glycolysis?

    e) What is the composition of human blood?

    f) What are simple and compound lipid?

    g) Why Kreb's cycle is important?

    h) What is triglyceride?

[Turn Over]

2. Answer any **one** question: 5×1=5

    a) Name one liquid connective tissue in our system. Why blood is red? Why blood is coagulated?
        1+1+3

    b) What are the types of enzyme inhibition? Define optimum pH and temperature of enzyme activity.
        3+2

    c) What is hormone? Give example of two peptide hormones which regulate blood-glucose level. Name two steroid hormones.
        2+2+1

3. Answer any **one**:   10×1=10

    a) How DNA and RNA are structurally different? Write a method of protein estimation. Why enzyme activity is lost at high temperature?
        4+4+2

    b) What is saponification number and iodine number of an oil? Write the method of determination of saponification number.
        4+6

    c) What is fermentation? How ethyl alcohol is produced by fermentation? What is rectified spirit?
        2+6+2

OPTION-B

CHEM-G-SEC-T-2(B)

(Analytical Clinical Biochemistry)

1. Answer any **five** questions: 1×5=5

    a) How carbohydrates are biologically important?

    b) What is cellular currency?

    c) What is lactic acid fermentation?

    d) What is phosphoglyceride?

    e) Write the name of a liquid connective tissue in our system.

    f) What is ribozyme?

    g) Name and mention function of one regulatory and structural proteins.

    h) What are the criteria of a protein to do enzymatic reaction?

2. Answer any **one** question: 5×1=5

    a) Write the structural features of glycogen and starch. How they are important?   3+2

    b) What are simple lipids? Write about neutral fat. How fat and oil can be distinguished chemically?   2+2+1

    c) Write about the nature and functions of human hormones operative in our system.   2+3

3. Answer any **one**:   10×1=10

    a) What is the mechanism of an enzymatic reaction? Explain Michaelis-Menten theory. What is stereospecificity of enzyme action?   4+3+3

    b) How carbohydrates can be estimated quantitatively? How a reducing sugar is tested? What clinical condition is indicated by higher level of urinary glucose?   5+3+2

    c) Write the possible explanations and effect :

        i) High values of blood urea and creatinine.

        ii) High values of chlesterol in blood.

        iii) Lower values of hemoglobin in blood.

        iv) High values of glucose in blood.   4+2+2+2

OPTION-C

CHEM-G-SEC-T-2(C)

(Basic Analytical Chemistry)

1. Answer any **five** questions: 2×5=10

   a) Define significant figures.

   b) Give one example of metal-ion indicator. Draw its structure.

   c) What do you mean by stationary phase? Give one example.

   d) What do you mean by complexometric titration?

   e) What do you mean by adulteration of food?

   f) What are the main compositions of soil?

   g) Name a chemical compound which can be used in trap cases. Give its structure.

   h) Write the name of two Class-I food preservatives.

2. Answer any **two** questions 5×2=10

   a) The concentration of Iron in two separate analyses is given by 16.17 ppm and 15.80 ppm. If the accepted value is taken as 16.00 ppm, calculate the absolute error as well as the relative error as percent in two cases. 5

   b) Define R_f value. Explain the factors on which it depends. 2+3

   c) Write the sum of $1.586 + 2.31$ with the correct number of significant figures. Give differences between accuracy and precision. 2+3

   d) What is meant by BOD of water? Find out the BOD of water sample which contains 1.5 gm of urea for every 100 litres of water. The reaction is as follows:

   $$NH_2CONH_2 + 4O_2 = CO_2 + 2NO_3^- + 2H^+ + H_2O$$

   2+3

OPTION-D

CHEM-G-SEC-T-2(D)

(IT Skills for Chemists)

1. Answer any **five** questions: 2×5=10

   a) What is the molar extinction co-efficient of a compound?

   b) Explain the term 'relative error' with example.

   c) What is an upper triangular matrix?

   d) What does ASCII stand for?

   e) Sketch the curve $y = ln\ x$.

f) Define the term 'standard deviation'.

g) What is debugging process?

h) What is meant by 'f' test?

2. Answer any **two** questions: 5×2=10

a) Calculate the pH of 0.3 molar of acetic acid. Given pK_a of acetic acid = 4.75.

b) What are the differences between AND and NAND logic operations?

c) A function $f : R \rightarrow R$ is defined by $f(x) = x^3$. Determine the range of f.

d) Most experiments are theoretical formulae, and usually those formulae are approximations. Is the error of approximation one of precision or of accuracy? Justify your answer with example.

OPTION-E

CHEM-G-SEC-T-2(E)

(Pharmaceutical Chemistry)

1. Answer any **five** questions: 2×5=10

a) Give an example with structure for *para*-Aminophenol derivative as analgesic.

b) Write two adverse effects of Aspirin.

c) Name the microorganisms from which Chloramphenicol and Penicillin are obtained.

d) How is Sulphacetamide synthesised?

e) Write the name of two drugs used as antibacterial and anti-fungal agents.

f) Give one use for each of Acyclovir and Phenobarbital.

g) Write the structure of Glyceryl trinitrate. Mention use of it.

h) Write one use and one adverse effect of Zidovudine.

2. Answer any **two** from the following: 5×2=10

a) Describe the method of production of ethyl alcohol by fermentation reaction.

b) What are the adverse effects of Streptomycin, Cephalosporin and Chloromycetin?

c) Discuss the uses of Streptomycin, Penicillin and Chloramphenicol.

d) Describe the preparation of Magnesium bisilicate antacid.

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