B.Sc. 4th Semester (Honours) Examination, 2019

Subject : Chemistry

Paper : SEC-2

(Pharmaceutical Chemistry)

Time: 2 Hours **Full Marks: 40**

The figures in the margin indicate full marks.

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

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

(a) What do you mean by analgesic? Give one example. 1+1=2

(b) Name two antifungal agents and draw their structures. 1+1=2

(c) How will you synthesise paracetamol? 2

(d) Name one cardiovascular drug and draw its structure. 1+1=2

(e) Name one antileprosy drug and draw its structure. 1+1=2

(f) State true or false: 1+1=2

(i) Chloramphenicol is an antifungal agent.

(ii) Ibuprofen is an anti-inflammatory agent.

(g) What do you mean by aerobic and anaerobic fermentation? 1+1=2

(h) Draw the core structure of Cephalosporin. Give one use of this drug. 1+1=2

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

(a) How will you synthesise aspirin and glyceryl trinitrate from appropriate starting material? Give one use of aspirin. 2+2+1=5

(b) Name one central nervous system depressant. Describe its synthesis. Give one use of ibuprofen. 1+3+1=5

(c) Describe the fermentation procedure of ethyl alcohol and citric acid. 2½+2½=5

(d) Draw the general structure of penicillin. What are the properties of penicillin? 2+3=5

3. Answer *any two* questions from the following: 10×2=20

(a) (i) Name one antiviral agent and an HIV-AIDS related drug. How will you synthesise them?

(ii) What are the main classes of antibiotics?

(iii) What do you mean by antipyretic agents? Give one example. (2+2+2)+2+(1+1)=10

(b) (i) Draw the chemical structure of chloramphenicol. How does it work? What are the uses of this drug?

(ii) What are the roles of Vitamin B_2 and Vitamin B_{12} in human body? (1+3+2)+(2+2)=10

(c) (i) Give a comprehensive account of Cephalosporins and provide appropriate exmaples.

(ii) Describe the synthesis of chloramphenicol from *p*-nitroacetophenone.

(iii) Which types of bacteria are killed by streptomycin? (3+2)+4+1=10

(d) (i) Describe the synthesis of ibuprofen from isobutyl benzene.

(ii) Why is ibuprofen called anti-inflammatory drug?

(iii) Name any five potent central nervous system (CNS) stimulants and given their structures. 3+2+(2½+2½)=10

B.Sc. 4th Semester (Honours) Examination, 2019

Subject : Chemistry

Paper : SEC-2

(Analytical Clinical Biochemistry)

Time: 2 Hours **Full Marks: 40**

The figures in the margin indicate full marks.

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

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

(a) What is the emperical formula of carbohydrate? What is glycosidic linkage?

(b) Why are proteins called amphipathic molecule?

(c) What do you mean by polyunsaturated fatty acid? Give an example.

(d) What is ribozyme?

(e) What is substrate level phosphorylation?

(f) Define heterolactic fermentation with example.

(g) What do you mean by "Christmas factor"? What is its role in blood coagulation?

(h) What is "Zwitter ion"? Mention its total charge.

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

(a) Briefly describe the primary and secondary structure of protein. 5

(b) What is Chargaff's principle? Explain Watson-Crick's Base pairing rule. 2½+2½=5

(c) Define Michaelis-Menten constant. What are co-enzyme and co-factor? Give an example of enzyme inhibition. 2+2+1=5

(d) Explain central dogma of molecular biology. What is 'CAP'? 4+1=5

3. Answer *any two* questions from the following: 10×2=20

(a) (i) What is packed cell volume? What do you mean by extrinsic blood coagulation?

(ii) How is blood preserved in Blood Bank? Give example of two buffers present in blood. (2+2)+(4+2)=10

(b) (i) Write down the procedure of urine production.

(ii) What are the normal constituents of urine?

(iii) What is black urine disease? 5+3+2=10

(c) (i) What do you mean by glycolysis? Where does it occur?

(ii) Why is glycolysis called EMP pathway? Show the flowchart of glycolysis. Mention the significance of glycolysis. (2+1)+(2+3+2)=10

(d) (i) What do you mean by invert sugar? What are homopolysaccharide and heteropolysaccharide? Provide example for each.

(ii) Why is carbohydrate called as protein sparing food?

(iii) Explain what you mean by 'rancidity'. (2+4)+2+2=10
