

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 1st Year 2nd Semester Final Examination, 2019
Subject: Introductory Computer Science
Course Code: ICS-102 (T)

Full Marks: 70

Time: 3 hours

Figures in the right margin indicate full marks. Answer **Five (5)** questions from each section. Use separate answer script for each section. Split answer is discouraged.

Section-A

1. a) Draw a block diagram to illustrate the basic organization of a computer system. 5
b) Contrast between ROM and RAM. 2
2. a) Define Operating System (OS). Is OS trends to isolate the hardware from the users? Justify your answer. 4
b) How is multiprocessing different from multiprogramming? 3
3. a) Differentiate between primary and secondary storage. 2
b) Why is the CPU called the central processing unit of a computer? Explain evidently. 2
c) Convert the following numbers: 3
i) $(7634.543)_{10} = (?)_2$
ii) $(101011.11001)_2 = (?)_8$
4. a) Define computer virus. Write down some harmful effects of computer virus. 4
b) Briefly describe the function of: 3
i) ALU ii) CU
5. a) Write down the difference between positional and non- positional number system. 2
b) Explain various types of computer based on their capacity. 3
c) Prove the statement $(x.y + x'.y).y' = 0$ using postulates. 2
6. a) What is meant by "generation" in computer terminology? How many computer generations are there until now? 3
b) Identify input and output devices from the following list: 4
Digitizer, OCR, Plotter, Scanner, Printer, OMR, Modem, Mouse

Section-B

7. a) Write down the role of Computer Science in food technology. 2
b) Make a comparison of characteristics of a computer with the user of that computer. 2
c) Point out two key technologies of hardware and software from each generation of computer. 3
8. a) Define DBMS (Database Management System). Briefly explain some major operations of DBMS. 4
b) Define ring topology with advantages and disadvantages. 3
9. a) How do you apply multimedia concepts to ease the teaching-learning system? 4
b) What is a Cache memory? How is it different from a primary memory? 3
10. a) Define word. How are the memories classified based on the word length? Explain briefly. 2
b) Perform the following operations indicating each step: 3
i) $111011011_2 / 101_2$ ii) $11011011_2 - 1011111_2$
c) Discuss the advantage and limitations of pseudo code. 2
11. a) How does the high level language overcome the limitations of machine language? Explain with example. 3
b) Differentiate among the assembler, the compiler and the interpreter. 2
c) Define internet. Write down the common services of Internet. 2
12. a) Write short note on: 3
i) Router ii) Switch iii) Hub
b) Define modem. Convert the digital signal '1101011' to analog signal using AM and PM. Here, 1 represents higher voltage. 2
c) Briefly explain how the Internet works. 2

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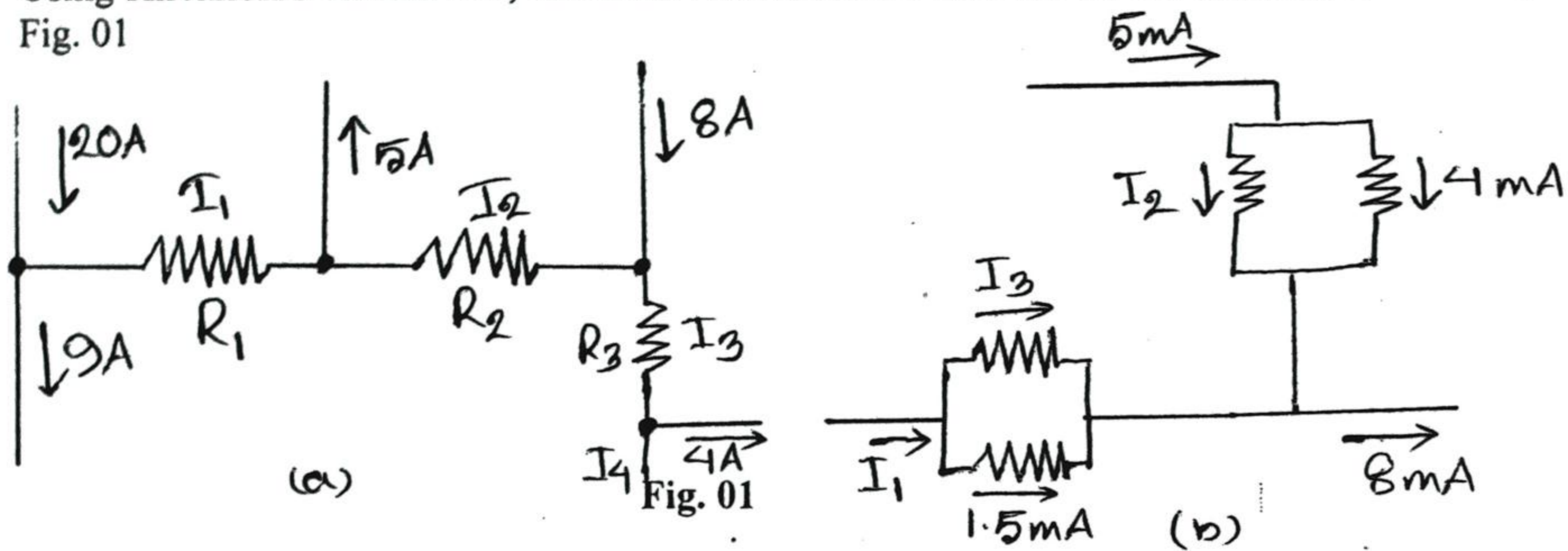
Full Marks: 70

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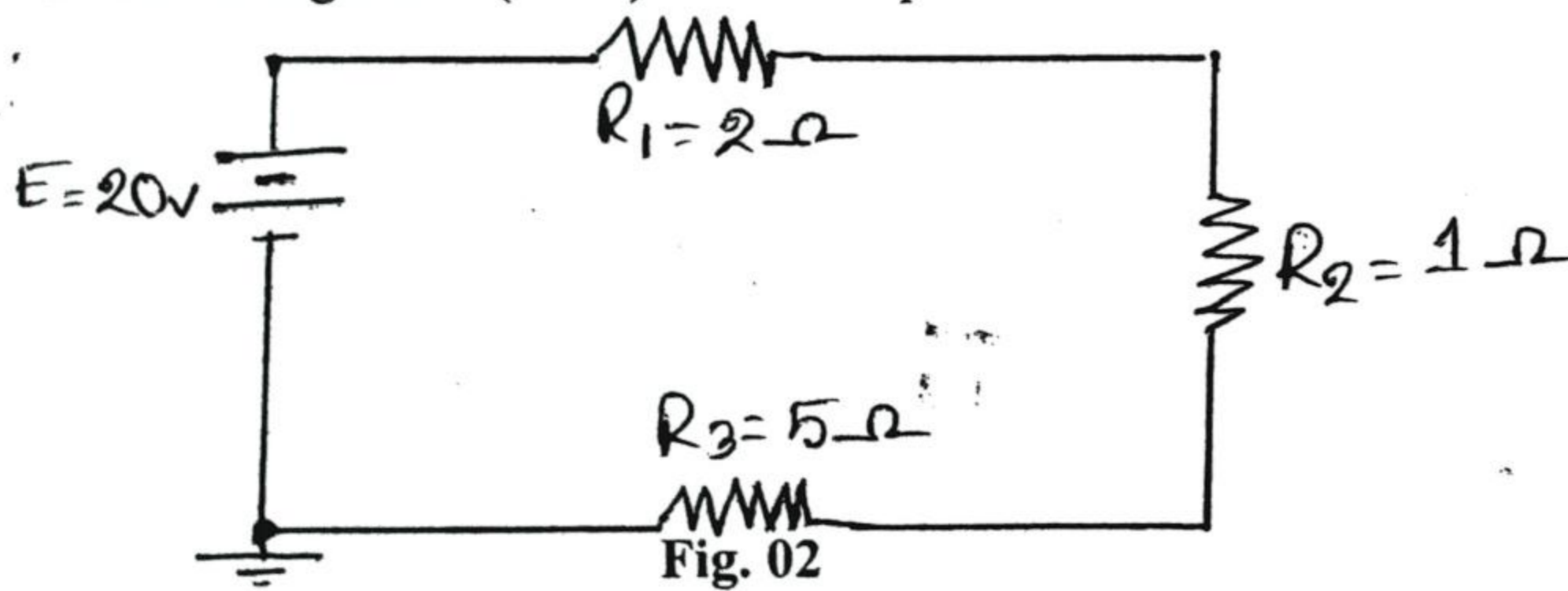
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Section-A

1. a) Explain series resistance and parallel resistance with circuit diagram. 3
 b) Using Kirchoff's current law, determine the unknown currents for the network of Fig. 01 4



2. a) What is meant by a semi-conductor? Discuss some important properties of semiconductors. 3
 b) Draw and explain the V-I characteristics of a p-n junction. 4
 3. a) State Kirchoff's Voltage Law (KVL) with example. 3
 b) 4



For the circuit in the Fig. 02

- i) Find the total resistance.
 ii) Calculate resulting source current.
 iii) Determine voltage across each resistor.

4. a) What is the difference between energy level and energy band? 2
 b) Give the energy band description of conductors, semiconductors and insulators. 5
 5. a) Differentiate between self induction and mutual induction. 2
 b) State and explain Faraday's law of electromagnetic induction. 2
 c) What is electron emission? Discuss the types of electron emission. 3
 6. a) Define the terms radioactive decay constant and half-life. 2
 b) Explain the concept of hole current. 2
 c) Discuss the effect of temperature on semiconductors. 3

Section-B

7. a) Describe briefly the structure of atom. 4
 b) Write short notes on: 3
 i) Free electron and
 ii) Valance electron

8. a) State and explain Voltage Divider rule.
 b)

3
4

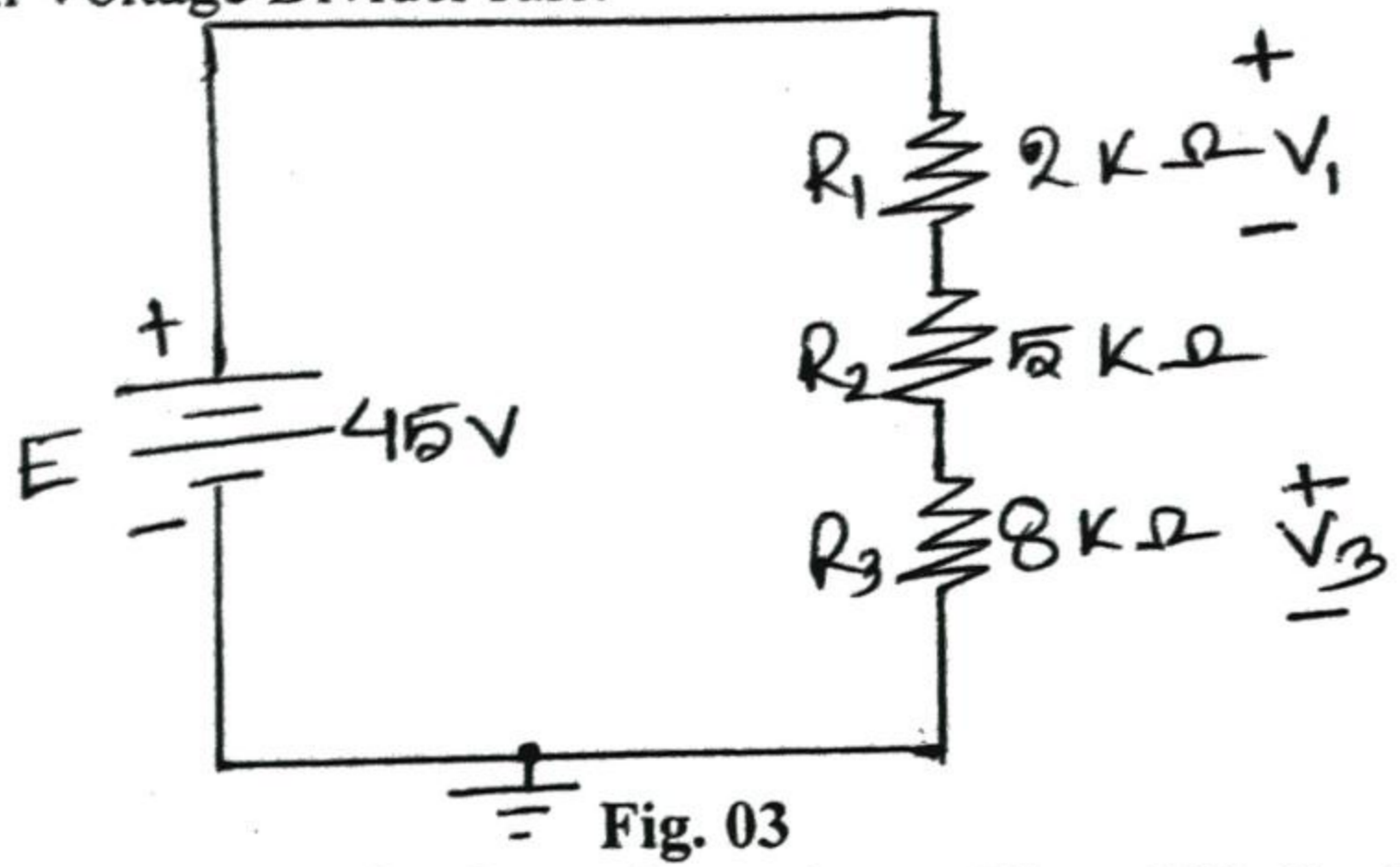


Fig. 03

Using the Voltage Divider rule, determine voltages V_1 and V_3 for the given circuit in Fig. 03

9. a) Derive an expression for the efficiency of a full wave rectifier. 5
 b) Discuss the importance of peak inverse voltage in rectifier service. 2
10. a) Write short notes on: 2+2=4
 i) Electromagnet
 ii) Diamagnetic, paramagnetic and ferromagnetic materials.
 b) Prove that, the inductance of an inductor with a ferromagnetic core is μ_r times the inductance obtained with an air core. 3
11. a) Find an expression for drift velocity of free charges in a conductor. 5
 b) State the laws of resistance. 2
12. a) Define (i) Reluctance (ii) Magnetic force 2
 b) Briefly explain the 'Hysteresis' with the help of hysteresis curve, hence define 'retentivity' and 'coercive force'. 5

Chattogram Veterinary and Animal Sciences University

Faculty of Food Science and Technology

BFST 1st year 2nd Semester Final Examination-2019

Subject: Biochemistry (Theory)

Course Code: BCM-102

Full Marks: 70

Time: 3 hours

(Figures in the right margin indicate full mark. Answer any 3 (Three) questions from each section of which question number 1 and 5 are compulsory. Use separate answer script for each section)

Section-A

1. a) Show the structure of α -D glucose. Write the importance of this component in human nutrition. 3
b) Give the differences in structure between maltose and cellobiose. Why can human being digest maltose but not cellobiose? 3
c) Write the differences among amylose, amylopectin and glycogen. 3
d) Classify monosaccharaides on the basis of carbon number with examples. 2
2. a) Differentiate between glycolysis and gluconeogenesis. What are the roles of HMP shunt in metabolic pathway? 4
b) Do you think NADPH is permeable to mitochondrial membrane? If no, how the transfer to mitochondria? 4
c) Describe the TCA cycle where amino acid enters to this cycle. Describe the dehydration and hydration reactions in TCA cycle. 4
3. a) Distinguish between fat and oil. Give examples of two short chain fatty acids with their structure. 3
b) Explain atherosclerosis and different types of lipoprotein. 3
c) Give example of phospholipid and glycolipid. Outline the importance of milk for young babies. 3
d) Define rancidity and antioxidant. Describe different types of rancidity. What measure will you take to reduce rancidity? 3
4. a) Briefly describe the ammonia pool in the human body. What are the ways of utilizing ammonia in human body? 4
b) Describe deamination, transamination and decarboxylation reactions with one example of each process. 4
c) Calculate the number of ATP production in Glycolysis and Creb's cycles. 4

Section-B

5. a) Classify fatty acids. Describe the role of polyunsaturated fatty acids in metabolic pathway. 3
b) Define codon, Anneling, Melting, Gene, Translation and Replication. 4
c) Define β -oxidation. How the human body utilizes stearic and palmitic acid for generating ATP? 4
6. a) Show a reaction of glycolysis where NADH^+H^+ is produced. Write the importance of this enzyme. 3
b) Define anaplerotic reaction. Show two anaplerotic reactions. 3
c) Give the steps to show ribose 5 (P) is produced from glucose. 3
d) Sketch out shuttle system and electron transport chain. 3
7. a) Why excess ammonia is toxic to us? 3
b) Show the reaction of urea cycle where ammonia enters into the cycle and it takes place in cytoplasm. 4
c) Give the example of oxidative deamination. 3
d) List the glycogenic and ketogenic amino acids. 2
8. a) Describe the translation with their stages. What do you mean by termination? 4
b) Define Intron and Exon. Mention the function of nucleic acid. 4
c) Describe a reaction where six carbon components are splitting into 2-3 position of carbon compounds. 4

Full Marks: 70

Time: 3 hours

(Figures in the right margin indicate full marks. Answer any **Five (5)** questions from each section.

Use separate answer script for each section. Split answer is strongly discouraged.)

Section A

1. a) Define absolute and relative errors. An approximate value of π is given by $X_1 = \frac{22}{7} = 3.1428571$ and its true value is $x = 3.1415926$. Find the absolute and relative errors. 2+1=3
- b) Use the Newton-Raphson method to find a root of the equation $x = e^{-x}$ correct to three decimal places. 4
2. a) When do we use Fourier series? Explain. 2
- b) Expand $f(x) = x^2$, $0 < x < 2\pi$ in a Fourier series if the period is 2π 5
3. a) Define differential equation. Describe various types of differential equation. 2
- b) Solve any two of the following differential equations: 2.5x2=5
 - i) $(D^2 - 3D - 4)y = \sin 2x$
 - ii) $(D^3 - 2D^2 - 5D + 6)y = e^{4x} + 1$
 - iii) $(2D^2 + 2D + 3)y = x^2 + 2x - 1$
4. a) Define interpolation. Form a table of differences for the function $f(x) = x^3 + 5x - 7$ for $x = -1, 0, 1, 2, 3, 4, 5$ 1+1=2
- b) The population of a town in decennial census were as under. Estimate the population for the year 1955. 5

Year	1921	1931	1941	1951	1961
Population(in thousands)	46	66	81	93	101

5. a) Define Fourier sine and Fourier cosine series. 2
- b) Find the half range Fourier cosine and sine series of function $f(x) = x^3$ in the interval $(0, \pi)$ 5
6. a) Find the general solution of $\frac{dy}{dx} + \left(\frac{2x+1}{x}\right)y = e^{-2x}$ 4
- b) Calculate the area of a parallelogram having axes $3\hat{i} + 2\hat{j} - 3\hat{k}$ and $4\hat{i} + 3\hat{j} + 2\hat{k}$ 3

Section-B

7. a) Calculate the rate of convergence of Bisection method. 3
- b) A cup of coffee at 190°F is left in a room of 70°F . At time $t=0$, the coffee is cooling at 15°F per minute. How long it will take for the temperature to reach 143°F ? 4
8. a) Write down the equation of Weddle's Rule for six data points of x and y . 2
- b) Define unit vector. Find a unit normal vector to the surface $xy^2 + z^2x^3 = 4$ at the point of $(2, 1, -2)$ 5

9. a) Use the Trapezoidal Rule with $n=5$ to approximate the integral $\int_1^2 \left(\frac{1}{x}\right) dx$

b) Evaluate $\int_0^1 \frac{dx}{1+x}$ by Simpson's Rule with $h=0.25$

10. a) Find the first and second order derivatives of function $y=f(x)$ tabulated below at the point $x=1.1$

x:	1.0	1.2	1.4	1.6	1.8	2.0
y:	0.0	0.128	0.544	1.296	2.432	4.0

b) Define gradient, divergence and curl.

11. a) Find order and degree and differential equation

$$\left(\frac{d^2y}{dx^2}\right)^2 = \sqrt[3]{1 + \frac{dy}{dx}}$$

b) Find the general solution of $(y^2-x^2)dx+2yxdx=0$

12. Find the Fourier series of $f(x)=x\sin x$.

Chattogram Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 1st Year 2nd Semester Final Examination 2019
Course Title: : Physical Chemistry (Theory)
Course Code: PCM-102 (T)

Full Marks:70

Time: 3 hours

(Figures in the right margin indicate full marks. **Answer any Four (4) questions** from each section of which question number **1 & 6 are compulsory**. Use separate answer script for each section. **Split answer is strongly discouraged.**)

SECTION-A

1. What is Le Chatelier's principle? Discuss its application. 5
2. a) State Raoult's law. Derive the equation of Raoult's law from the relationship between vapor pressure of solution and mole fraction of solvent. 5
 b) What do you mean by molarity, normality, molality and mole fractions of solutions? Calculate the above mentioned concentration terms if 40gm Na₂CO₃ is dissolved in 500ml solution. 5
3. a) With suitable examples mention different colloidal systems with their dispersed phase and dispersion mediums. 4
 b) Name different dispersion methods for preparation of colloids. Discuss any of them in detail. 6
4. a) Differentiate between order and molecularity of a reaction. 2
 b) Deduce the rate expression for second order reaction where both the concentration terms are same. 4
 c) Define half life of a reaction. Explain half life of first order reaction is independent of initial concentration of reactant. 1+3
5. a) Derive the relation between free energy change and equilibrium constant. 5
 b) How can you differentiate between true solutions and colloidal solutions.? Why do colloids show Tyndall effect, while solutions not? 3
 c) Discuss the effect of temperature on vapor pressure of solution. 2

SECTION-B

6. a) What is p^H, titration and indicator? 3
 b) Why does p^H of buffer solution not change? 2
7. a) What are homogenous and heterogenous equilibrium? 2
 b) Clearly explain your concept of dynamic equilibrium. What are the criteria of chemical equilibrium? 2+3
 c) State the law of mass action. Why is optimization required in equilibrium systems? 3
8. a) State and explain Hesse's law. 3
 b) Discuss about Faraday's law of electrolysis. 3
 c) What is meant by electrical double layer? Briefly discuss about Brownian movement in colloidal solutions. 4
9. a) Write down the mechanism of acidic and basic buffer solution. 4
 b) Discuss acid-base reactions in terms of conductometric titration method. 4
 c) Explain the terms: heat of solution and heat of neutralisation. 2
10. a) Why do reactions of higher order are rare? 3
 b) What are strong and weak electrolytes? 3
 c) Discuss the importance of osmosis in biological systems. 4

Chattogram Veterinary and Animal Sciences University

Faculty of Food Science and Technology

BFST 1st year 2nd Semester Final Examination, 2019

Subject: Fundamentals of Food Engineering (Theory)

Course Code: FFE-102 (T)

Full Marks: 70

Time: 3 hours

(Figures in the right margin indicate full marks. Answer any four questions from each section where question no. 1 and 6 are compulsory. Use separate answer script for each section. Split answer is not allowed.)

Section-A

1. a) Define "Food Science" and "Food technology". 1+1=2
b) Outline the scope of food science and technology in Bangladesh. 3
2. a) Do you think retorting, blanching and 12D values are important in the field of food engineering? Defend your statement. 5
b) You are given a food with 10^9 heat resistant bacteria per two gram for commercial sterilization in 800 gm of can. If the retort contains 2000 cans, using 12D heating concept, how many cans would be sterilized? 5
3. a) Differentiate between pasteurization and sterilization. 4
b) Why commercial preservation of food is necessary? 2
c) Illustrate the physical properties of food raw materials. 4
4. a) Discuss the importance of food preservation. Describe the principle and methods of food preservation. 3+3=6
b) Write down the effect of heat treatment on composition and quality of food. 4
5. a) Briefly describe the important of blanching and exhausting in food canning. 4
b) Define head space. Illustrate double seam. 4
c) Write down the criteria to select fruits and vegetables for canning. 2

Section-B

6. a) Briefly describe the factors affecting size reduction. 5
7. a) Describe shortly the growth properties of the raw materials. 5
b) Explain process suitability and contact purchasing of raw materials. 5
8. a) Define food engineering operation. Give an overview of food engineering operation. 5
b) Discuss the objectives and importance of size reduction. Write down the mechanisms of size reduction. 5
9. a) Define F value, Z value, TDT and D value. 6
b) Explain the uses of distillation process in food processing. Differentiate between steam distillation and fractional distillation. 4
10. Give short notes on: 4 X 2.5 = 10
 - i) Gas absorption
 - ii) Ball mill
 - iii) Drum screw
 - iv) Roller mill

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SECTION-A

- | | | |
|----|---|---------|
| 1. | Derive Henderson-Hasselbalch equation for basic buffer solution. | 05 |
| 2. | a) What is hydrogen bond? | 02 |
| | b) Explain intra and inter molecular hydrogen bond. | 02 |
| | c) Discuss covalent bond with examples. | 03 |
| | d) Explain the term 'Variable Covalency'. | 03 |
| 3. | a) Define ionic bond. | 02 |
| | b) Write down differences between ionic and covalent bond. | 04 |
| | c) Which factors are involved for the formation of ionic Bond? | 04 |
| 4. | a) What is indicator? | 02 |
| | b) Discuss the mechanism of buffer solution. | 05 |
| | c) What is the p^H of human saliva?
($[OH^-] = 4 \times 10^{-8} M$) | 03 |
| 5. | a) What is the difference between oxidation and reduction reaction? Give example. | 03+01=4 |
| | b) Write down the significance of oxidation number. | 02 |
| | c) Balance the following equation
$K_2Cr_2O_7 + KI + H_2SO_4 \rightarrow Cr_2(SO_4)_3 + I_2$ | 04 |

SECTION-B

- | | | |
|----|--|--------|
| 6. | Draw a flowchart of isolation of inert gases by coconut charcoal method. | 5 |
| 7. | a) What do you mean by 'Fixation of Nitrogen'? Explain. | 03 |
| | b) Describe the production process of soda ash by Solvay process. | 07 |
| 8. | a) Differentiate between titrate and titrant. | 02 |
| | b) Describe the extraction process of Radium. | 03 |
| | c) Write down some uses of Be and Mg. | 02 |
| | d) How do you express concentration of solution | 03 |
| | i) Molarity | |
| | ii) Molality | |
| | iii) Normality | |
| 9. | a) Write down different uses of Boric Acid. | 02 |
| | b) Give a brief account of different oxides of P, S and N. | 03 |
| | c) Write down the extraction process of Aluminium from Alumina. | 05 |
| 10 | Write a short note on any two of the following : | 5x2=10 |
| | i) Compounds of Carbon | |
| | ii) Frasch process | |
| | iii) Drude & Laurentz theory | |

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Section-A

- | | | | |
|----|----|--|--------------|
| 1. | a) | Companies are attempting to save telephone communication cost by implementing a technology. What is the technology called? Explain Briefly. | 2 |
| | b) | Define DBMS. Briefly illustrate the E-R model with proper diagram. | 3 |
| 2. | a) | A 64 bit operating system is installed on a computer. Now write down the size of word and how many bits can process that computer at a time? | 2 |
| | b) | Define protocol. Briefly narrate all key components of TCP/IP protocol with figure. | 1+3=4 |
| | c) | Define computer program. Write down some common extensions of program files for windows PC. | 1+3=4 |
| 3. | a) | What is the basic difference between OMR and OCR? | 4 |
| | b) | Write short note on MICR. | 2 |
| | c) | What are I/O devices? List common I/O devices. | 1+1=2 |
| | d) | List the features of Microsoft word. | 2 |
| 4. | a) | Convert the following number by showing your conversion steps clearly- | 1+1=2 |
| | | i) $(A8B79)_{16}$ to Octal | |
| | | ii) $(1010101100111)_2$ to Hexadecimal | |
| | b) | Evaluate the following : | 1+1=2 |
| | | i) $1100101001 - 110110111$ | |
| | | ii) $11100111000 + 110101001$ | |
| | c) | What do you mean by LAN? Briefly discuss all types of communication with example. | 1+2=3 |
| | d) | Write a short note on the followings : | 0.75 × 4 = 3 |
| | | i) Entity ii) Attributes iii) Relationship iv) Field | |
| 5. | a) | Define Cache memory. Draw the functional diagram of Cache memory with the interaction of CPU and secondary memory. | 1+2=3 |
| | b) | Write down all major differences between compiler and interpreter. | 3 |
| | c) | What does E-commerce stand for? Write down all major threats of office automation. | 1+3=4 |

Section-B

- | | | | |
|-----|----|--|-------------|
| 6. | a) | With the help of illustration briefly explain the following network topologies: | 2+1.5+1.5=5 |
| | | i) Star topology | |
| | | ii) Ring topology | |
| | | iii) Bus topology | |
| 7. | a) | Calculate the 1's and 2's complement of the following number | 3 |
| | | i) $(11001010110)_2$ ii) $(00101011001)_2$ | |
| | b) | What is Bootstrap program? Briefly discuss all types of ROM with their programming style. | 1+3=4 |
| | c) | Draw the figures of Multiprogramming and multiprocessing system. | 3 |
| 8. | a) | What is a computer crime? Write short notes on | 1+5=6 |
| | | i) Computer virus ii) Hacking | |
| | b) | Briefly discuss the influence of computers on | 1+2+1=4 |
| | | i) Commerce ii) Education and iii) Communication | |
| 9. | a) | Suppose you set up a network to connect all digital devices of your home. What is the name of your designed network? Write down the properties of your designed network. | 1+3=4 |
| | b) | Mention all the points where the Switch and Hub cannot match. | 3 |
| | c) | Define virtual memory. Describe how does virtual memory work? | 1+2=3 |
| 10. | a) | Name the common transmission media and briefly explain their characteristics. | 4 |
| | b) | What is programming language? List some features of the C and Java. | 1+3=4 |
| | c) | Classify computer systems on the basis of capacity. | 2 |