

Chittagong Veterinary and Animal Sciences University

Faculty of Food Science and Technology

BFST 2nd year 1st Semester Final Examination 2017

Subject: Technology of Food Preservation (Theory)

Course Code: TFP-201

Full Marks: 70

Time: 3 hours

(Figures in the right margin indicate full marks. Answer any four (4) questions from each section where question no. 1 and 6 are compulsory. Use separate answer script for each section. Split answer is strongly discouraged.)

Section-A

1. Briefly describe the causes of food deterioration. Illustrate major food preservation techniques. 2+3=5
2. a) Analyze and describe the plant product storage techniques. 5
b) Discuss the factors affecting fruit and vegetable quality. 5
3. a) Define Rehydration-co-efficient. Conclude the reconstitution test for dehydrated products. 1+2=3
b) If the drained weight of 20 gm dried sample containing 8% moisture after rehydration is 75 gm and the fresh sample before drying contained 90% moisture, then calculate the Rehydration co-efficient and percent water in the rehydrated material. 4
c) Enumerate the differences between conventional and freeze drying. 3
4. a) What is chemical preservation? 2
b) Briefly describe the mechanism of salt-sugar preservation of foods. 4
c) What do you mean by curing? Describe the curing processes. 1+3=4
5. a) Define dehydro-freezing. Analyze the effect of storage atmosphere in connection with chilling storage. 1+3=4
b) Distinguish quick freezing over slow freezing. Briefly describe the quick freezing methods. 3+3=6

Section-B

6. "Analysis of moisture content is an important part of food preservation"- Justify this statement. 5
7. a) Differentiate between Newtonian and Non-Newtonian fluid with examples. Discuss angle of repose. 2+2=4
b) Illustrate the basic viscoelastic models for solid foods. 6
8. a) Define defects. Distinguish different types of defects. 2+2=4
b) Discuss the hidden characteristics of foods. Assess the responsibility of a quality controller in an industry in brief. 3+3=6
9. a) Define food irradiation. Appraise potential application of food irradiation. 2+3=5
b) Briefly describe the irradiation process indicating its different units. 5
10. Write short notes: (any four) 4x2.5=10
 - a) Heat sensitive material drying method,
 - b) Properties of granular foods and powders,
 - c) Changes during refrigerated and freeze storage,
 - d) Natural preservatives,
 - e) Regulation and restriction of using food additives.

Chittagong Veterinary and Animal Sciences University

Faculty of Food Science and Technology

BFST 2nd year 1st Semester Final Examination 2017

Subject: Applied Nutrition (Theory)

Course Code: APN-201

Full Marks: 70

Time: 3 hours

(Answer any five questions from each section. Use separate answer script for each section. Split answer is strongly discouraged.)

Section-A

1. a) Define nutritional anthropometry. 2
b) How to do you assess nutritional status of mass people? 2
c) Mention the advantages and limitations of anthropometric assessment of nutritional status. 3
2. a) What are the types of emergency feeding program? 2
b) How can you construct a general food distribution system in an emergency situation? 5
3. a) What do you mean by nutritional problem? 2
b) Bangladesh is now facing double burden of malnutrition. Give your opinions on the above issue. 5
4. a) What is food balance sheet? 2
b) Write down a brief description about food balance sheet. 5
5. a) Differentiate between nutritional survey and surveillance. 3
b) What are the problems encountered during field level nutritional relief distribution? 4
6. a) What do you mean by acute energy deficiency and chronic energy deficiency? 1.5x2
b) Sketch and discuss the conceptual framework of malnutrition adopted by UNICEF. 4

Section-B

7. a) Define Body Mass Index. What are the cut of point of BMI of an adult? 3
b) What are the rations of mass feeding? 2
c) When therapeutic feeding program is needed? 2
8. a) What are the common anthropometric measurements are used? 2
b) What is MUAC? Classify MUAC for under five children. 2
c) Define stunting, wasting and under-weight. 3
9. a) What are the criteria of nutritional message? 2
b) How do you formulate and score of a nutritional message? Discuss in details about this. 5
10. a) "Biochemical assessment method is more complicated to carry out than other methods" Narrate down opinions above this. 3
b) Differentiate between quantitative and qualitative dietary survey methods. 4
11. a) Define IDA and IDD. What are causes of iron and iodine deficiency of a nation? 4
b) Point out the clinical sign-symptoms of IDD. 3
12. a) Define PEM. Write the etiology of PEM in under developing country. 2
b) What are the common sign-symptoms of PEM? 3
c) Differentiate between kwashiorkor and marasmus. 2

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 2nd year 1st Semester Final Examination, 2017
Subject: General Microbiology (Theory)
Course Code: GMC-201

Full Marks: 70

Time: 3 hours

(Figures in the right margin indicate full marks. Answers any three (3) questions from each section where question no 1 and 5 are compulsory. Split answer is strongly discouraged.)

Section-A

1. a) Show the difference between cell wall of gram positive and gram negative bacteria. 03
b) Write about the structure and functions of bacterial flagella and pili. 04
c) Describe the process of endospore germination. Give the reasons why the endospores are much more resistant to heat than vegetative cells. 04
2. a) Write about the contributions of the following scientists in the microbiology: i) Antony van Leeuwenhoek, ii) Louis Pasteur, iii) Robert Koch. 3x2=6
b) Explain Koch postulation for proving that a specific microorganism causes a particular disease. 03
c) Name two endospore forming bacteria. Describe the structure and function of the prokaryotic plasma membrane. 0.5+2.5=3
3. a) With labeled diagram show the difference between yeast and mold. 4
b) Discuss about the sexual reproduction of fungi. 4
c) Classify fungi based on morphology, and sexual reproduction. 4
4. a) What is plasmid? How genetic engineering can be used for human welfare. 2+3=5
b) What is genetic recombination? Discuss the different methods by which genetic materials can be transferred in prokaryotes. 2+5=7

Section-B

5. a) Define genes, genome and codon. Enumerate the basic steps followed in recombinant DNA technology for bacteria. 3+3=6
b) Along with functions list the different enzymes involved in DNA replication of bacteria. 2
c) Write down the characteristics of endotoxin produced by bacteria. 3
6. a) Define bacterial metabolism. Distinguish catabolism from anabolism. 1+2=3
b) Briefly describe the methods usually employed for the isolation of bacteria in pure culture. 4
c) Explain how microbes are classified on the basis of temperature and O₂ requirement. 5
7. a) What is bacteriophage? Briefly describe the physical and chemical structure of an enveloped virus. 1+5=6
b) State the general characteristics of virus. How do viruses differ from rickettsia and chlamydia? 2+2=4
c) Name five (05) molds that have industrial importance. 2
8. Write short note on the followings (any three): a) Bacteriological media, 3x4=12
b) Mycotoxin, c) Mutation and d) Bacterial growth curve.

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 2nd year 1st Semester Final Examination 2017
Subject: Unit operations in Food Processing (Theory)
Course Code: UFP-201

Full Marks: 70

Time: 3 hours

(Figures in the right margin indicate full marks. Answer any four (4) questions from each section where question no. 1 and 6 are compulsory. Use separate answer script for each section. Split answer is strongly discouraged.)

Section-A

1. Define unit operation. Enlist the common unit operations practiced in food industry. 1+4=5
2. a) Explain the principle and theory of thin layer drying. Name the important parameter which affects the rate of drying. 4+1=5
 b) In manufacturing of jam, the crushed fruit is mixed with sufficient sugar to give a mixture of 45 parts by weight of fruits to 55 parts by weight of sugar and sufficient pectin (4 oz/100 lbs of fruit) and the citric acid at the rate of 0.4% of fruit added. The mixture is evaporated until the soluble solids are 66%. What yield of jam can be expected from a fruit which has 14% soluble solids? 5
3. a) Write the principle of mass balance. Briefly describe the tunnel dryer. 3+2=5
 b) A drum dryer is going to be designed for drying of milk with initial solid content of 25% to a final moisture content 2% (db). An overall heat transfer coefficient (U) of 300 BTU/ hr ft²°F. Temperature difference between the roller surface and the product of 150°F is being used for design purpose. Determine the surface area of the roller required to provide production rate of 50 lbm/hr. Enthalpy change 1200 BTU/ lbm. 5
4. a) Show how drying rate constant is dependent on product thickness. 3
 b) State and derive the usable form of the first order kinetic equation. 4
 c) Differentiate between conventional and freeze dehydration method. 3
5. a) "Desorption isotherm usually lies above the adsorption isotherm"-explain the statement. Show the relationship between free moisture and equilibrium moisture content in drying process. 06
 b) Find out the value of K (permeability of water with respect to vapor transport) of freeze drying process when quantity of water removed is 200 gm, drying time five hours, vapor pressure at 47°C is 82 mm of Hg. Total pressure in the freeze drying chamber is 0.16 mm of Hg and the thickness of dried product is 2 cm. 04

Section-B

6. a) How freezing preserve foods? Why do we see more new refrigerated foods entering the market place than other foods? 1+2=3
 b) How does freezer burn affect product quality during preservations? 02
7. a) Define critical and equilibrium moisture content. Explain Air blast freezer, Plate freezer and Immersion freezer according to their utilization. 2+3=5
 b) An air blast freezer is being designed to freezing chicken using condition that enable chicken to be frozen in 160 minute, the spiral conveyor that carries the chicken through the freezer has a speed of 12 feet / minute. Determine the dimension of freezing chamber and capacity of refrigeration system in ton of refrigeration. Assume, Diameter of chicken 6 feet,
 latent heat 120 BTU / lbm,
 product density 55 lbm/ ft³,
 1600 chicken will be in the chamber. 05
8. a) List the various guidelines required for evaporation. Draw and label forward, backward and parallel feed triple effect evaporator. Also compare the steam economy from those triple effect evaporators. 2+2+2=6

- b) Compare the heat transfer coefficient through condensation films on vertical and horizontal tubes. Saturated steam at 30 lbf/inch² absolute pressure (250⁰F) is being utilized as heating medium in the evaporator. The tube length is 10 feet with 2 inch diameter and the evaporator temperature is 170⁰F. 04
- Assume, latent heat of vaporization, $L_v=945.3$ BTU/lbm,
thermal conductivity $K_f=0.395$ BTU/hr ft⁰F,
Acceleration due to gravity, $g=32.2$ ft/ sec²,
Density= 59.9 lbm/ ft³,
Viscosity = 0.18×10^{-3} lb/ftsec.
9. a) Differentiate between overall heat transfer coefficient and thermal conductivity. Develop an expression for 3 dimensional heat conduction. Equations in an isotropic solid. 2+3=5
- b) Determine the convective, heat transfer coefficient for a plate heat exchanger with a 1/4 inch distance between plates. The product is non-Newtonian with $n=0.5$ and thermal conductivity, $K= 0.3$ BTU/hr ft⁰F. 05
10. a) State Brunauer-Emmet-Teller (BET) adsorption theory. 02
- b) Develop a relationship between moisture content weight basis and moisture content dry basis. 04
- c) Write the short notes on : boiling point elevation and Reynolds number 2+2=4

Chittagong Veterinary and Animal Sciences University
Faculty of Food Science and Technology
BFST 2nd Year 1st Semester Final Examination, 2017
Subject: Basic Electrical and Electronic Engineering
Course Code: EEE-201(T)

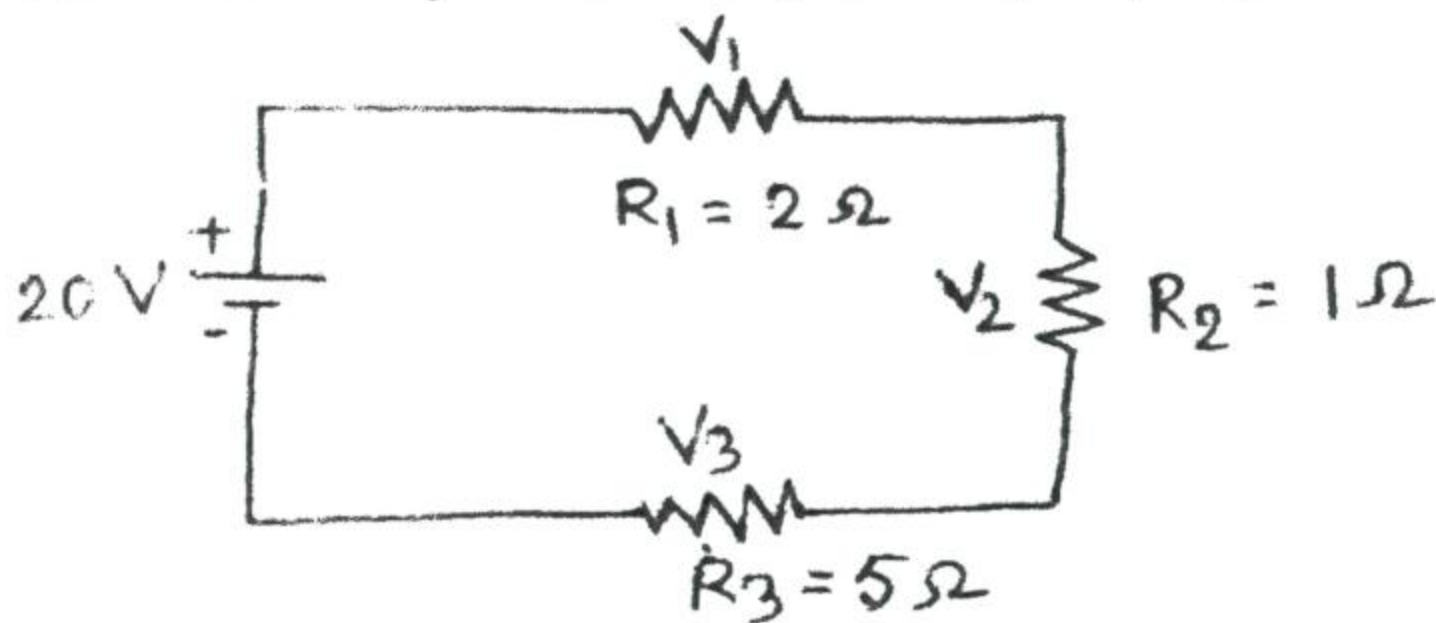
Full Marks: 70

Time: 3 hours

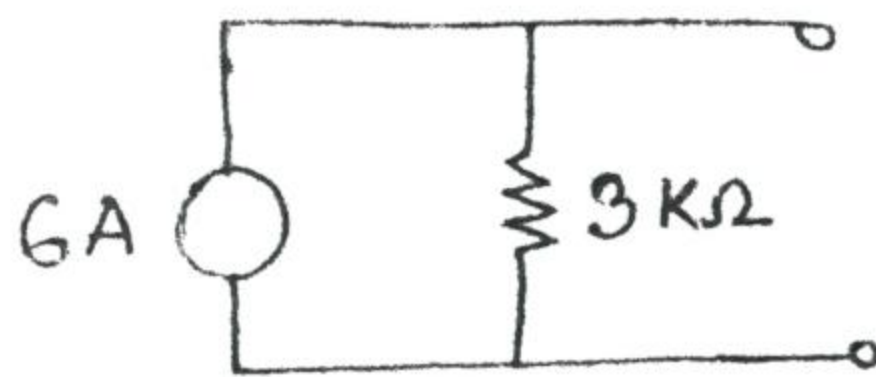
(Figures in the right margin indicate full marks. Answer **Four (4)** questions from each section where question no. **1 and 6** are compulsory. Use separate answer script for each section. Split answer is strongly discouraged.)

Section-A

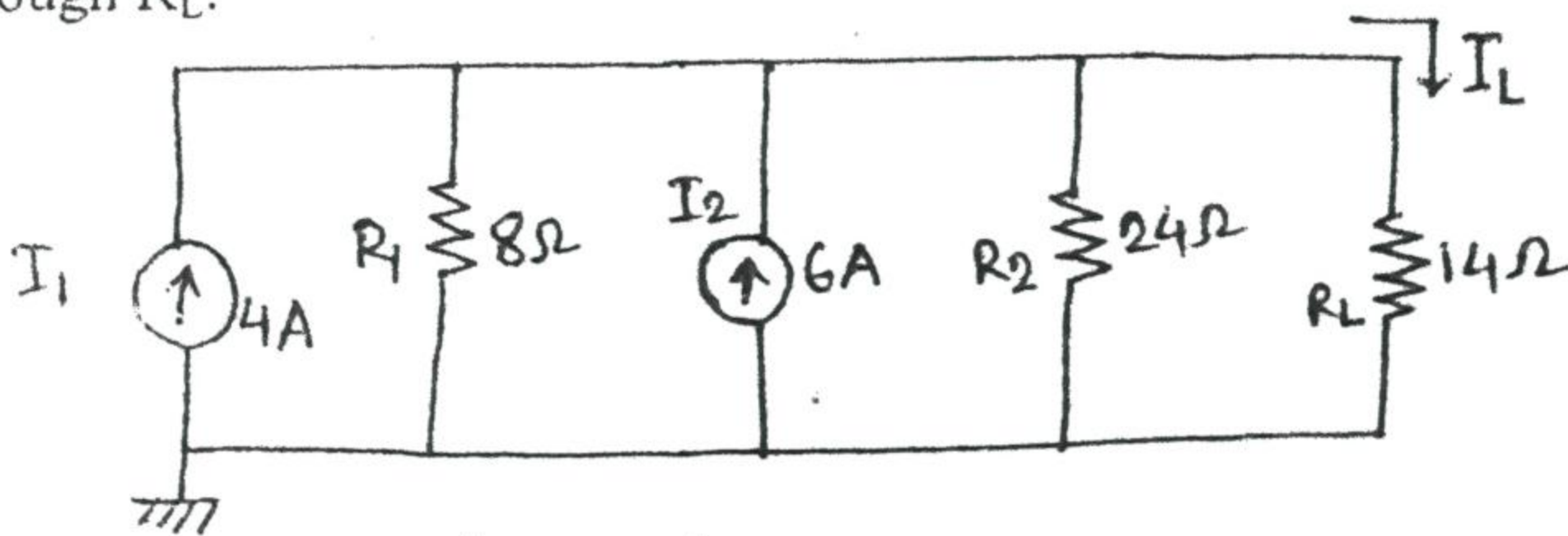
1. a) What is meant by resistor? Which four factors are responsible to determine the resistance of any material? 3
 b) State and explain Ohm's law. 2
2. a) What is the power dissipated by a $5\ \Omega$ resistor if the current is 4A ? 2
 b) i) Find the total resistance for circuit of Fig 2(b) 8
 ii) Calculate the source current I_s .
 iii) Determine the voltage V_1 , V_2 and V_3 .
 iv) Calculate the power dissipated by R_1 , R_2 , R_3 .



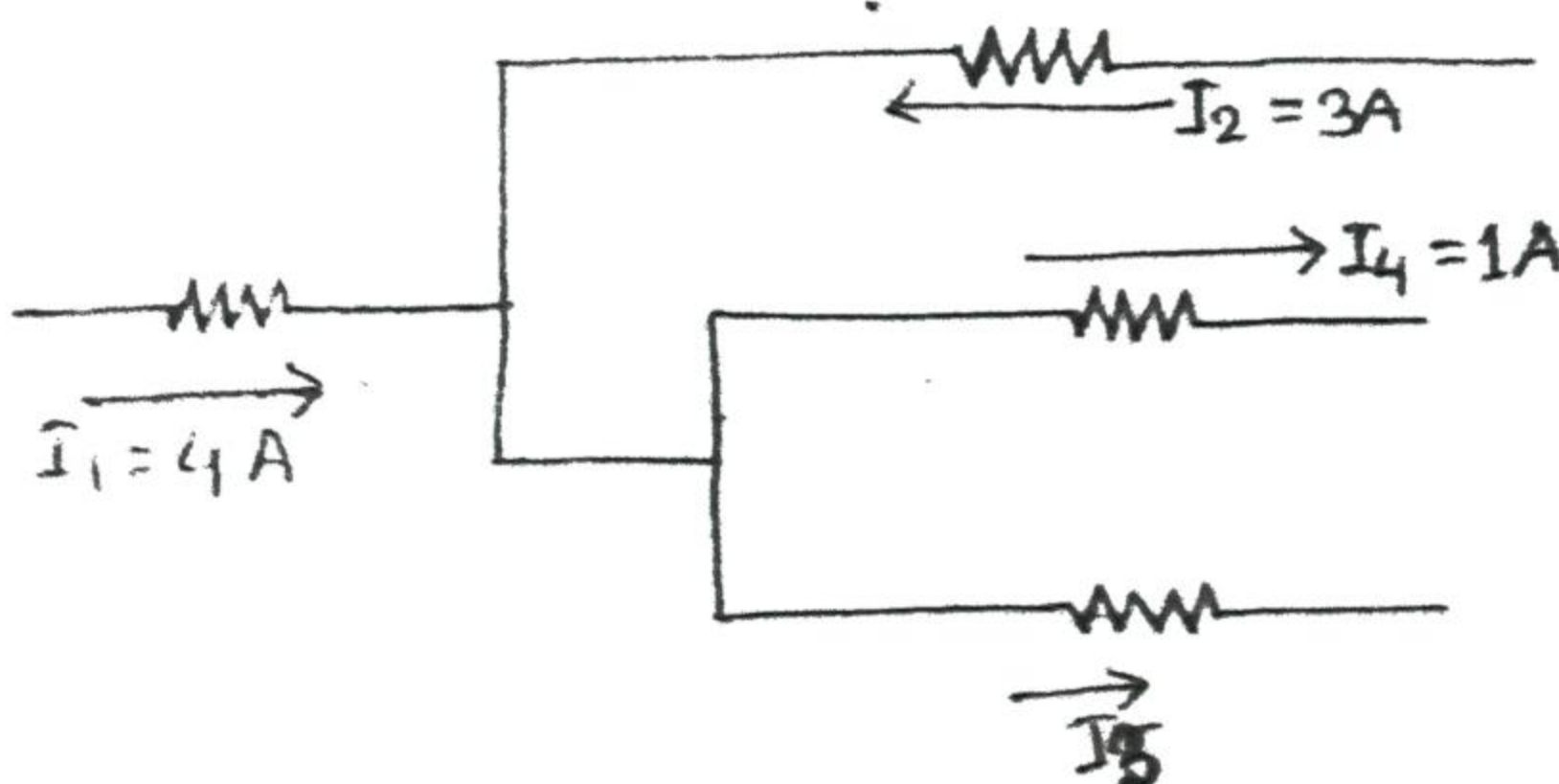
3. a) Convert the current source of Fig 3(a) into voltage source. 2



- b) Reduce the network of Fig 3(b) to a single current source and calculate the current through R_L . 6



- c) Determine the current resulting from the application of a 9-V battery across a network with a resistance of $2.2\ \Omega$. 2
4. a) State and explain Kirchhoff's current law. 3
 b) "Two current sources cannot be used in series"-Justify the statement. 3
 c) Determine the currents I_3 and I_5 of Fig 4(c) through application of KCL. 4



5. a) Apply branch current method to the network of Fig 5(a) and find out branch current. 8

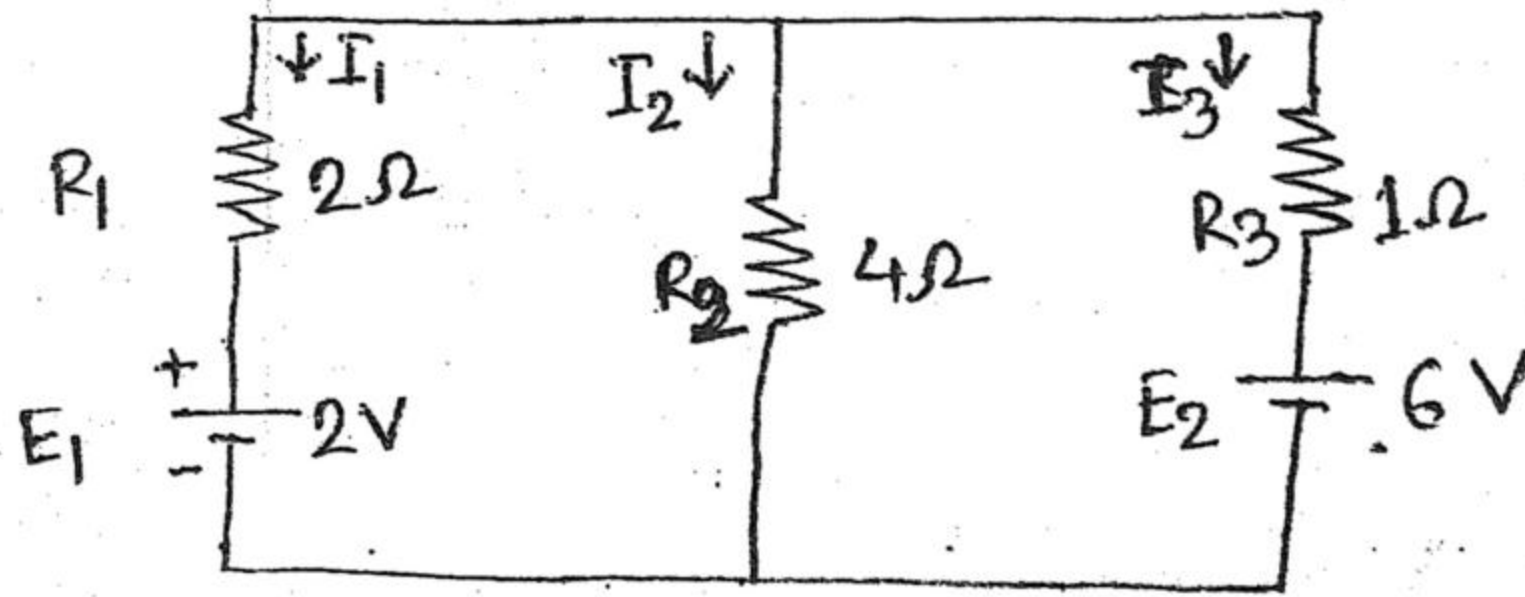


Fig: 5(a)

- b) Define voltage source and current source. 2

Section-B

6. a) What is doping? Explain how n-type and p-type materials are formed? 3
 b) With neat sketch, explain I-V characteristics of p-n junction diode. 2

7. a) For the series diode configuration of Fig 7(a), determine V_D , V_R and I_D . 5

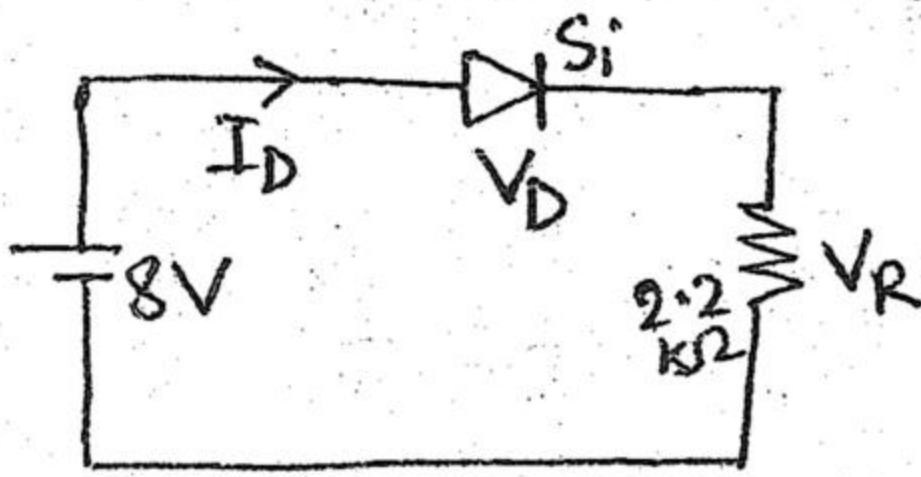


Fig: 7(a)

- b) Find I_D and V_0 of Fig 7(b). 3

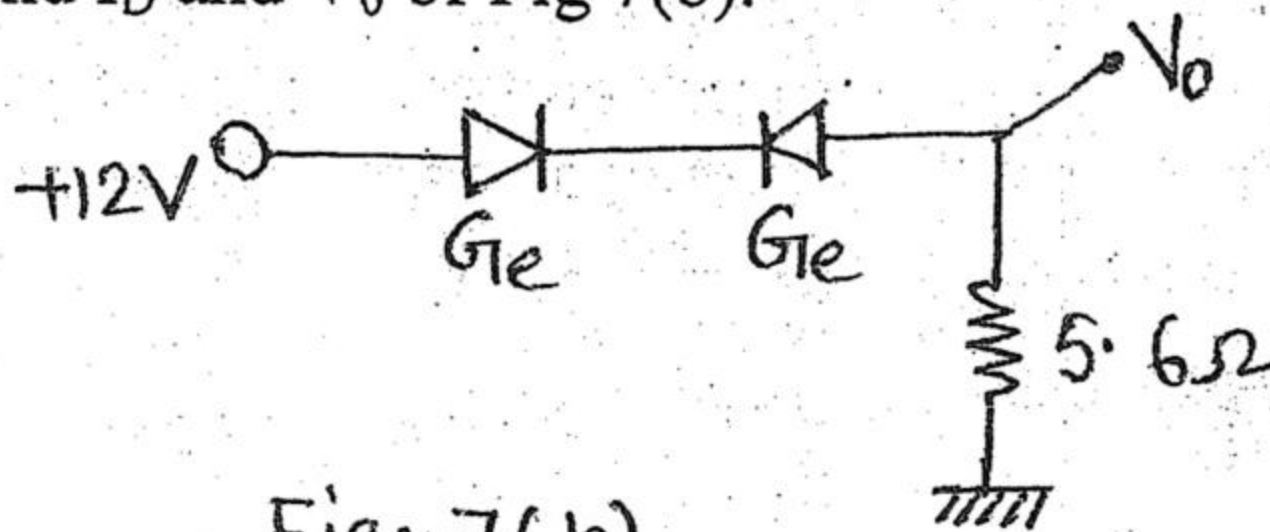


Fig: 7(b)

- c) What is meant by pnp and npn transistor. 2

8. a) For the circuit of Fig 8(a), find 8
 i) Total capacitance
 ii) Charge on each plate
 iii) Voltage across each capacitor

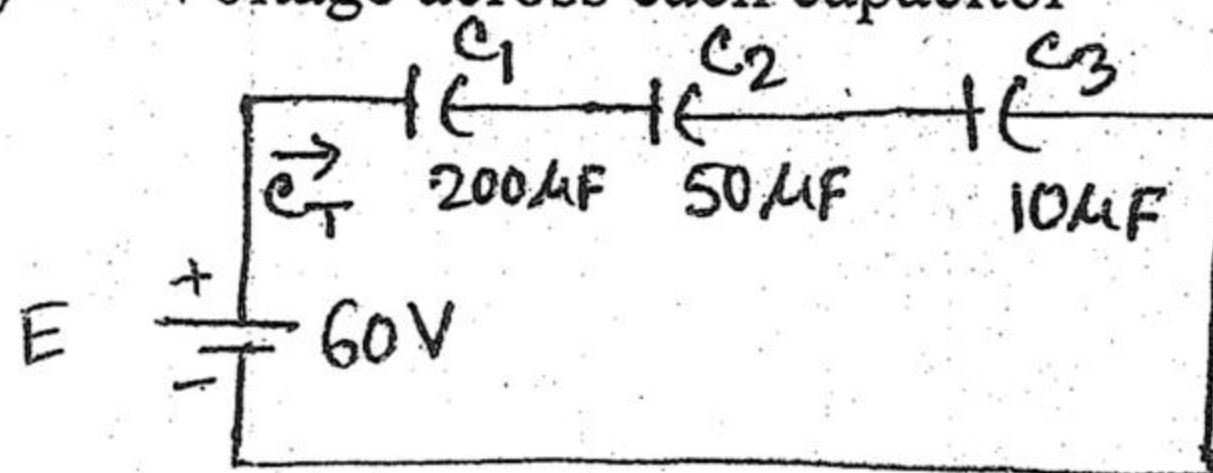


Fig: 8(a)

- b) Explain Lenz's law. 2

9. a) Write the basic principles of transformer. 4
 b) State the superposition theorem. 2
 c) Determine I_1 using superposition theorem of the network of Fig 9(c). 4

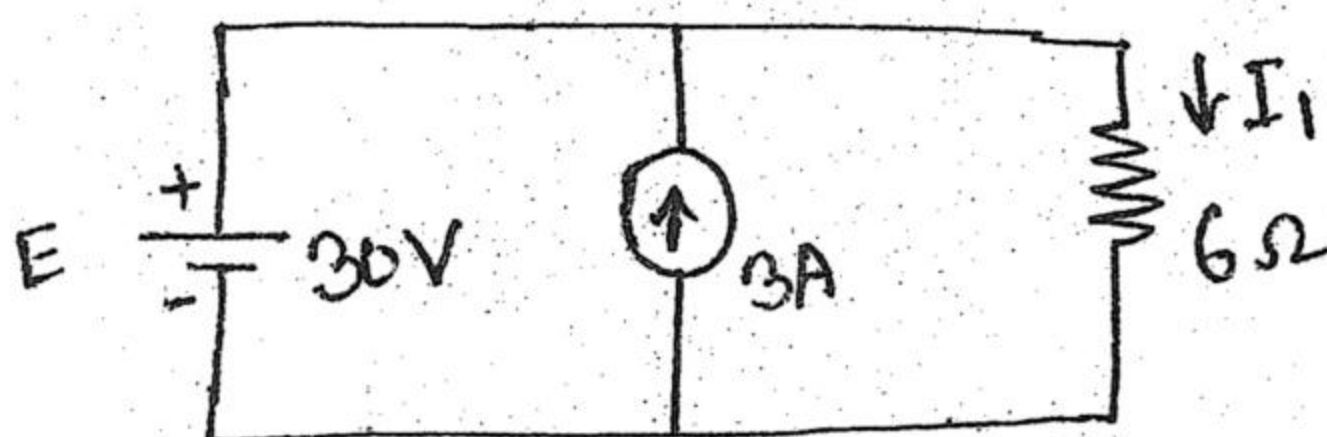


Fig: 9(c)

10. a) State and explain Faraday's law of electromagnetic induction. 3
 b) Briefly explain generator principle. 4
 c) Define with example step up and step down transformer. 3

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Time: 3 hours

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Section-A

1. a) How will you synthesize chlorobenzene from benzene? 2
b) Draw the chemical structure of a weed killer and a powerful antiseptic. 3
2. a) On the basis of Huckel rule, account for the aromaticity of benzene. 2
b) How will you convert the following compound into benzene? 8
i) Toluene
ii) Benzoic acid
iii) Benzenediazonium chloride
iv) Phenol
3. a) What do you mean by functional group? 2
b) Give one reaction which proves that alcohols are acidic in nature. 2
c) Show with equations when propene is separately treated with dilute KMnO_4 in CCl_4 . 3
d) Give Aldol condensation reaction. 3
4. a) Arrange the following compounds in order of increasing acidity 2
(i) CH_3COOH (ii) BrCH_2COOH (iii) Br_2CHCOOH
b) Discuss the mechanism of esterification of carboxylic acids. 4
c) What will happen (Only reaction)? 4
i) Hydrolysis of esters
ii) Ethanoic acid reacts with thionyl chloride
iii) Ethanoic acid reacts with bromine in the presence of red phosphorus
iv) Ethylene glycol reacts with $\text{K}_2\text{Cr}_2\text{O}_7$ in the presence of H_2SO_4
5. a) How is ethyl alcohol manufactured? 5
b) What will happen (Only reaction)? 5
i) Ethanol reacts with PCl_5
ii) Ethanol reacts with sodium
iii) Ethanol reacts with Conc. H_2SO_4 at 140°C
iv) Sodium methoxide reacts with methyl iodide
v) Ethanol reacts with acetyl chloride

Section-B

6. a) Explain the term Aromaticity. 2
b) Write the point of difference of aldehydes and ketones. 3
7. a) Give two methods of preparation of alkanes. 4
b) "Alkanes do not react with acids, alkalies, oxidizing agents etc. at room temperature." Explain. 2
c) What is Markonikownikov's rule? In presence of peroxide why does Markonikownikov's rule not exist? 4

8. a) Discuss the action of nitrous acids on primary, secondary and tertiary amines. 4
b) Identify (A), (B) and (C) in the following reaction sequence: 3
$$\text{CH}_3\text{CH}_2\text{OH} \xrightarrow{\text{SOCl}_2} \text{(A)} \xrightarrow{\text{NaCN}} \text{(B)} \xrightarrow{\text{LiAlH}_4} \text{(C)}$$

c) How will you synthesize methylamine from ethylamine? 3
9. a) How will you convert phenol into the following compounds: 8
i) Picric acid
ii) Salicylic acid
iii) Benzene and
iv) Aniline
b) How will you distinguish between phenol and benzyl alcohol? 2
10. a) Write short notes on any three of the following: 6
i) Williamsen ether synthesis
ii) Bayer test
iii) Ozonolysis of alkynes and
iv) Pyrolysis of alkane
b) Give some uses of ether. 2
c) Write down the oxidation reaction of alcohols. 2