

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)

DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination

Summer Semester, A. Y. 2017-2018

Course No. : BTM 4201

Time : 3 Hours

Course Title : Financial Accounting II

Full Marks : 150

There are **8 (eight)** questions. Answer any **6 (six)** questions. All questions carry equal marks. Marks in the margin indicate full marks. Programmable calculators are not allowed. Do not write on this question paper.

1. Morgan Company's balance sheet at December 31, 2016, is presented below. 25

MORGAN COMPANY

Balance Sheet

December 31, 2016

Cash	\$ 30,000	Accounts Payable	\$ 13,750
Inventory	30,750	Interest Payable	250
Prepaid Insurance	6,000	Notes Payable	50,000
Equipment	<u>38,000</u>	Owner's Capital	<u>40,750</u>
	<u>\$104,750</u>		<u>\$104,750</u>

During January 2017, the following transactions occurred. (Morgan Company uses the perpetual inventory system)

- Morgan paid \$250 interest on the note payable on January 1, 2017. The note is due on December 31, 2018.
- Morgan purchased \$261,100 of inventory on account.
- Morgan sold for \$440,000 cash, inventory which cost \$265,000. Morgan also collected \$28,600 in sales taxes.
- Morgan paid \$230,000 in accounts payable.
- Morgan paid \$17,000 in sales taxes to the state.
- Paid other operating expenses of \$30,000.
- On January 31, 2017, the payroll for the month consists of salaries and wages of \$60,000. All salaries and wages are subject to 7.65% FICA taxes. A total of \$8,900 federal income taxes are withheld. The salaries and wages are paid on February 1.

Adjustment data:

- Interest expense of \$250 has been incurred on the notes payable.
- The insurance for the year 2017 was prepaid on December 31, 2016.
- The equipment was acquired on December 31, 2016, and will be depreciated on a straight-line basis over 5 years with a \$2,000 salvage value.

- Employer's payroll taxes include 7.65% FICA taxes, a 5.4% state unemployment tax, and a 0.8% federal unemployment tax.

Instructions (You may need to set up T-accounts to determine ending balances.)

- Prepare journal entries for the transactions listed above and the adjusting entries.
- Prepare an adjusted trial balance at January 31, 2017.
- Prepare an income statement, an owner's equity statement for the month ending January 31, 2017, and a classified balance sheet as of January 31, 2017.

2. a) M. Gomez (beginning capital \$50,000) and I. Inez (beginning capital \$80,000) are partners. During 2017 the partnership earned net income of \$60,000, and Gomez made drawings of \$15,000 while Inez made drawings of \$20,000. 12

Instructions

- Assume the partnership income-sharing agreement calls for income to be divided 55% to Gomez and 45% to Inez. Prepare the journal entry to record the allocation of net income.
- Assume the partnership income-sharing agreement calls for income to be divided with a salary of \$30,000 to Gomez and \$20,000 to Inez with the remainder divided 55% to Gomez and 45% to Inez. Prepare the journal entry to record the allocation of net income.
- Assume the partnership income-sharing agreement calls for income to be divided with a salary of \$40,000 to Gomez and \$30,000 to Inez, interest of 10% on beginning capital, and the remainder divided 50%-50%. Prepare the journal entry to record the allocation of net income.
- Compute the partners' ending capital balances under the assumption in part (iii).

- b) The Braun Company at December 31 has cash \$15,000, noncash assets \$110,000, liabilities \$60,000, and the following capital balances: Ho \$40,000 and Li \$25,000. The firm is liquidated, and \$90,000 in cash is received for the noncash assets. Ho's and Li's income ratios are 60% and 40%, respectively. 13

Instructions

- Prepare a cash distribution schedule.
- Prepare the entries to record the following, assuming that The Braun Company decides to liquidate the company.
 - The sale of noncash assets.
 - The allocation of the gain or loss on liquidation to the partners.
 - Payment of creditors.
 - Distribution of cash to the partners.

3. a) Alexandra and Kellie operate a beauty salon as partners who share profits and losses equally. The success of their business has exceeded their expectations; the salon is operating quite profitably. Kellie is anxious to maximize profits and schedules appointments from 8 a.m. to 6 p.m. daily, even sacrificing some lunch hours to accommodate regular customers. Alexandra schedules her appointments from 9 a.m. to 5 p.m. and takes long lunch hours. Alexandra regularly makes significantly larger withdrawals of cash than Kellie does, but, she says, "Kellie, you needn't worry, I never make a withdrawal without you knowing about it, so it is properly recorded in my drawings account and charged against my capital at the end of the year." Alexandra's withdrawals to date are double Kellie's. 10

Instructions

- i. Who are the stakeholders in this situation?
 - ii. Identify the problems with Alexandra's actions and discuss the ethical considerations involved.
 - iii. How might the partnership agreement be revised to accommodate the differences in Alexandra's and Kellie's work and withdrawal habits?
- b) The partners in Crawford Company decide to liquidate the firm when the balance sheet shows the following. 15

CRAWFORD			
Balance Sheet			
31-May-17			
Assets		Liabilities and Owners' Equity	
Cash	\$27,500	Notes payable	\$13,500
Accounts receivable	25,000	Acc. payable	27,000
Allowance for doubtful	-1,000	Salaries & wages payable	4,000
Inventory	34,500	A. Jamison, capital	33,000
Equipment	21,000	S. Moyer, capital	21,000
Accumulated depreciation—equipment	-5,500	P. Roper, capital	3,000
	\$101,500		\$101,500

The partners share income and loss 5:3:2. During the process of liquidation, the following transactions were completed in the following sequence.

- A total of \$51,000 was received from converting noncash assets into cash.
- Gain or loss on realization was allocated to partners.
- Liabilities were paid in full.
- P. Roper paid his capital deficiency.
- Cash was paid to the partners with credit balances.

Instructions

- i. Prepare the entries to record the transactions.
- ii. Post to the cash and capital accounts.
- iii. Assume that Roper is unable to pay the capital deficiency. First, prepare the entry to allocate Roper's debit balance to Jamison and Moyer. Second, prepare the entry to record the final distribution of cash.

- 4. a) At December 31, 2017, Lebron Company distributes \$50,000 of cash dividends. Its outstanding common stock has a par value of \$400,000, and its 6% preferred stock has a par value of \$100,000 at December 31, 2017. 8

Instructions

- i. Show the allocation of dividends to each class of stock, assuming that the preferred stock dividend is 6% and not cumulative.
- ii. Show the allocation of the dividends to each class of stock, assuming the preferred stock dividend of 6% is cumulative and Lebron Company did not pay any dividends on the preferred stock in the preceding 2 years.
- iii. Journalize the declaration of the cash dividend at December 31, 2017, assuming the requirements in part (ii).

- b) Oswald Company reported retained earnings at December 31, 2016, of \$400,000. Oswald had 200,000 shares of common stock outstanding throughout 2017. 7

The following transactions occurred during 2017.

- i. An error was discovered; in 2015, insurance expense was recorded at \$90,000, but the correct amount was \$60,000.
- ii. A cash dividend of \$0.50 per share was declared and paid.
- iii. A 5% stock dividend was declared and distributed when the market price per share was \$18 per share.
- iv. Net income was \$310,000.

Prepare a retained earnings statement for 2017.

- c) Dirk Company reported the following balances at December 31, 2016: common stock \$500,000, paid-in capital in excess of par value—common stock \$100,000, and retained earnings \$250,000. 5

During 2017, the following transactions affected stockholders' equity.

- i. Issued preferred stock with a par value of \$125,000 for \$200,000.
- ii. Purchased treasury stock (common) for \$40,000.
- iii. Earned net income of \$180,000.
- iv. Declared and paid cash dividends of \$56,000.

Prepare the stockholders' equity section of Dirk Company's December 31, 2017, balance sheet.

- d) In 2017, Pennington Corporation had net sales of \$600,000 and cost of goods sold of \$360,000. Operating expenses were \$153,000, and interest expense was \$7,500. The corporation's tax rate is 30%. The corporation declared preferred dividends of \$15,000 5

in 2017, and its average common stockholders' equity during the year was \$200,000.

Instructions

- i. Prepare an income statement for Pennington Corporation.
 - ii. Compute Pennington Corporation's return on common stockholders' equity for 2017.
5. a) Nick Bosch has prepared the following list of statements about bonds. 7
- i. Bonds are a form of interest-bearing notes payable.
 - ii. Secured bonds have specific assets of the issuer pledged as collateral for the bonds.
 - iii. Secured bonds are also known as debenture bonds.
 - iv. A conversion feature may be added to bonds to make them more attractive to bond buyers.
 - v. The rate used to determine the amount of cash interest the borrower pays is called the stated rate.
 - vi. Bond prices are usually quoted as a percentage of the face value of the bond.
 - vii. The present value of a bond is the value at which it should sell in the marketplace.

Identify each statement as true or false. If false, indicate how to correct the statement

- b) Gilliland Airlines is considering two alternatives for the financing of a purchase of a fleet of airplanes. These two alternatives are: 5
- Issue 90,000 shares of common stock at \$30 per share. (Cash dividends have not been paid nor is the payment of any contemplated.)
 - Issue 10%, 10-year bonds at face value for \$2,700,000.

It is estimated that the company will earn \$800,000 before interest and taxes as a result of this purchase. The company has an estimated tax rate of 30% and has 120,000 shares of common stock outstanding prior to the new financing.

Determine the effect on net income and earnings per share for these two methods of financing.

- c) Adcock Company issued \$600,000, 9%, 20-year bonds on January 1, 2017, at 103. 8
Interest is payable annually on January 1. Adcock uses straight-line amortization for bond premium or discount.

Prepare the journal entries to record the following.

- i. The issuance of the bonds.
- ii. The accrual of interest and the premium amortization on December 31, 2017.

- iii. The payment of interest on January 1, 2018.
 - iv. The redemption of the bonds at maturity, assuming interest for the last interest period has been paid and recorded.
- d) Gridley Company issued \$800,000, 11%, 10-year bonds on December 31, 2016, for \$730,000. Interest is payable annually on December 31. Gridley Company uses the straight-line method to amortize bond premium or discount. 5

Prepare the journal entries to record the following.

- i. The issuance of the bonds.
 - ii. The payment of interest and the discount amortization on December 31, 2017.
 - iii. The redemption of the bonds at maturity, assuming interest for the last interest period has been paid and recorded.
6. a) List the similarities and dissimilarities of GAAP and IFRS. 10
- b) Debby Kauffman and her two colleagues, Jamie Hiatt and Ella Rincon, are personal trainers at an upscale health spa/resort in Tampa, Florida. They want to start a health club that specializes in health plans for people in the 501 age range. The growing population in this age range and strong consumer interest in the health benefits of physical activity have convinced them they can profitably operate their own club. In addition to many other decisions, they need to determine what type of business organization they want. Jamie believes there are more advantages to the corporate form than a partnership, but he hasn't yet convinced Debby and Ella. They have come to you, a small-business consulting specialist, seeking information and advice regarding the choice of starting a partnership versus a corporation. 8

Prepare a memo (dated May 26, 2016) that describes the advantages and disadvantages of both partnerships and corporations. Advise Debby, Jamie, and Ella regarding which organizational form you believe would better serve their purposes. Make sure to include reasons supporting your advice.

- c) After deciding to incorporate, each of the three investors receives 20,000 shares of \$2 par common stock on June 12, 2016, in exchange for their co-owned building (\$200,000 fair value) and \$100,000 total cash they contributed to the business. The next decision that Debby, Jamie, and Ella need to make is how to obtain financing for renovation and equipment. They understand the difference between equity securities and debt securities, but do not understand the tax, net income, and earnings per share consequences of equity versus debt financing on the future of their business. 7

Prepare notes for a discussion with the three entrepreneurs in which you will compare the consequences of using equity versus debt financing. As part of your notes, show the differences in interest and tax expense assuming \$1,400,000 is financed with common stock, and then alternatively with debt. Assume that when common stock is used, 140,000 shares will be issued. When debt is used, assume the interest rate on debt is 9%, the tax rate is 32%, and income before interest and taxes is \$300,000. (You may want to use an electronic spreadsheet.)

7. a) Ragsdell Corporation had the following transactions.

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- i. Issued \$200,000 of bonds payable.
- ii. Paid utilities expense.
- iii. Issued 500 shares of preferred stock for \$45,000.
- iv. Sold land and a building for \$250,000.
- v. Lent \$30,000 to Tegtmeier Corporation, receiving Tegtmeier's 1-year, 12% note.

Classify each of these transactions by type of cash flow activity (operating, investing, or financing)

b) The income statement for Kosinski Manufacturing Company contains the following condensed information.

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KOSINSKI MANUFACTURING COMPANY

Income Statement

For the Year Ended December 31, 2017

Sales revenue		\$6,583,000
Operating expenses, excluding depreciation	\$4,920,000	
Depreciation expense	<u>880,000</u>	<u>5,800,000</u>
Income before income taxes		783,000
Income tax expense		<u>353,000</u>
Net income		<u>\$ 430,000</u>

Included in operating expenses is a \$24,000 loss resulting from the sale of equipment for \$270,000 cash. Equipment was purchased at a cost of \$750,000. The following balances are reported on Kosinski's comparative balance sheet at December 31.

KOSINSKI MANUFACTURING COMPANY

Comparative Balance Sheets (partial)

	2017	2016
Cash	\$672,000	\$130,000
Accounts receivable	775,000	610,000
Inventory	834,000	867,000
Accounts payable	521,000	501,000

Income tax expense of \$353,000 represents the amount paid in 2017. Dividends declared and paid in 2017 totaled \$200,000.

8. a) Frizell Company has the following comparative balance sheet data.

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FRIZELL COMPANY

Balance Sheets December 31

Cash	\$ 15,000	\$ 30,000
Accounts receivable (net)	70,000	60,000
Inventory	60,000	50,000
Plant assets (net)	200,000	180,000

	<u>\$345,000</u>	<u>\$320,000</u>
Accounts payable	\$ 50,000	\$ 60,000
Mortgage payable (6%)	100,000	100,000
Common stock, \$10 par	140,000	120,000
Retained earnings	55,000	40,000
	<u>\$345,000</u>	<u>\$320,000</u>

Additional information for 2017:

- Net income was \$25,000.
- Sales on account were \$410,000. Sales returns and allowances were \$20,000.
- Cost of goods sold was \$198,000.

Compute and explain the following ratios at December 31, 2017.

- i. Current ratio.
- ii. Accounts receivable turnover.
- iii. Acid-test ratio.
- iv. Inventory turnover.

b) Wiemers Corporation's comparative balance sheets are presented below.

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WIEMERS CORPORATION
Balance Sheets December 31

	2017	2016
Cash	\$ 4,300	\$ 3,700
Accounts receivable (net)	21,200	23,400
Inventory	10,000	7,000
Land	20,000	26,000
Buildings	70,000	70,000
Accumulated depreciation— buildings	(15,000)	(10,000)
Total	<u>\$110,500</u>	<u>\$120,100</u>
Accounts payable	\$ 12,370	\$ 31,100
Common stock	75,000	69,000
Retained earnings	23,130	20,000
Total	<u>\$110,500</u>	<u>\$120,100</u>

Wiemers's 2017 income statement included net sales of \$100,000, cost of goods sold of \$60,000, and net income of \$15,000.

Compute the following ratios for 2017.

- i. Current ratio.
- ii. Asset turnover.
- iii. Acid-test ratio.
- iv. Return on assets.
- v. Accounts receivable turnover.
- vi. Return on common stockholders' equity.
- vii. Inventory turnover.
- viii. Debt to assets ratio.
- ix. Profit margin.

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DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination

Summer Semester, A. Y. 2017-2018

Course No. : BTM 4203

Time : 3 Hours

Course Title : Business Communication

Full Marks : 150

There are **8 (eight)** questions. Answer any **6 (six)** questions. All questions carry equal marks. Marks in the margin indicates full marks. Do not write on this question paper.

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1. a) "No one can know exactly what occurs inside the minds of communicators when they undertake to create a message, but researchers generally agree that the communication process includes some specific steps". Examine the steps of communication process. 10
 - b) "Business communication does not merely mean writing letters. There are many more modes and styles of effective communication." Discuss. 5
 - c) "Informal communication network is not just for rumors. It may be useful in many ways." Justify your answer. 10
 2. a) What is the most effective way for a manager to communicate production schedules to his staffs? Your employer has asked you to prepare a detailed report outlining the benefits to his company for buying a new machine tool. What issues would you address in your report? How would your report help in making the final decision? 15
 - b) What are the purposes of preparing a business report? What are the qualities that make a good report? 10
 3. a) Mr. Rishi Daswani was the manager of the Sangam Leather Factory, Kanpur. In one of his vacations, he undertook a short course in management and public relations, in one of the third rated commercial institutions that have mushroomed in Noida. It then dawned upon him, that all these years he had been doing the wrong thing, by dealing only with the section heads under him. On his return to the factory, he was a new Rishi. He began having lunch in the Workers' mess; he even exchanged a few smutty jokes. Over a cup of tea, he told them a story of his life and many spicy episodes about the lives of the directors all in the interest of better public relations. He even joined them once, in ragging a foreman, who wore an old-fashioned coat and topi. 15

Trouble started a few days later. There were thefts in the factory and absenteeism had increased. Further there were four incidents of workers refusing to carry out the orders of their supervisors and three workers were found in a drunken state on the plant.

- i. Discuss the communication barriers in this case.
- ii. If you were in the manager's place, what would you do? Sack the drunken worker? Or have a confidential talk with them?
- iii. Explain how would you handle this situation and suggest for the solution.

- b) Write explanatory notes on formal communication channel that can meet business needs of an organization. 10
4. a) What are the different steps involved in preparing a case study in a problem solving method? 10
- b) Differentiate between program implementation and program effects case study with relevant example. 8
- c) Discuss different types of approaches to case study. 7
5. a) "Business Development" is considered to open up a new market for own new market offerings. It is concerned with the analytical preparation of potential growth opportunities for the management as well as the subsequent support and monitoring of its implementation. Identify the stages when building a new business. 12
- b) One of the methods which are likely to be used for generating new ideas is brainstorming. Brainstorming as method does not mean a chat that is generating enough business ideas for all the problems. Develop a frame of a brainstorming-workshop to generate new business ideas. 6
- c) Mention the success factors of innovative market offerings within the existing company frame when they develop new business idea. 7
6. a) You have received a complaint from a valued customer from Chitrakoot, pointing out that furniture he had ordered for a special occasion has arrived in a damaged condition. Though the fault is of the transport company, you have decided to replace the damaged furniture immediately. Draft a suitable reply to the customer. 10
- b) Your company organized a cancer awareness camp with the help of well qualified and senior doctors. Prepare a suitable press release on the occasion. 8
- c) How do business organizations take advantages from issuing press release? 7
7. a) Leadership, at any level, certainly isn't easy—but unclear, vague, roller-coaster pronouncements make many top managers' jobs infinitely more difficult than they need to be. Why do many organizations sink into chaos due to listening problem? Mention the reasons. 10
- b) Effective communication is a leader's most critical tool for doing the essential job of leadership: inspiring the organization to take responsibility for creating a better future. What are the five messages a manager must manage? 10
- c) How does graphics-aid make a presentation more effective and comprehensible? 5

8. a) You work as a marketing co-op student in the office of Community Relations and Marketing at your school. This office promotes and oversees all university-wide charitable events. One such event is the yearly book drive on behalf of the city's public schools. 10
- Your job is to write a persuasive message to send all students, faculty, and staff soliciting their contributions. You'll need to tell them when, where, and how to donate their books. You'll need to tell them what kinds of books you want and what kind of shapes these books need to be in (you're willing to take used books if they're in good condition; those that aren't good enough will be taken to a recycling center). Think about your reader's likely questions and about the kinds of details that might restrain them to donate. Once you've worked out the logistics and your persuasive strategy, write the message.
- b) From the viewpoint of an entrepreneur, prepare a detailed project profile for poultry farming and cultivation vegetables in five acres of land. 10
- c) How do you prove that you are an effective communicator? 5

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DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination

Summer Semester, A. Y. 2017-2018

Course No. : BTM 4205

Time : 3 Hours

Course Title : Principles of Marketing

Full Marks : 150

There are **8 (eight)** questions. Answer any **6 (six)** questions. Question no. 8 is compulsory. Marks in the right margin indicate full marks. Do not write on this question paper.

1. a) What do you mean by needs, wants and demands? Which one(s) can influence marketers more? 5
- b) What do you mean by marketing? How the father of modern marketing has defined the term marketing? 5
- c) What are the philosophies of marketing? What are the differences between selling concept and marketing concept? Which concept will you choose as a marketer to launch a new product? Why? 15
2. a) What is marketing environment? What are the basic differences between macro-environment and micro-environment? 5
- b) Mention all the types of macro-environment. Explain the impact of political environment. 10
- c) What are the steps of buyer decision process? Mention the adaptation process for new product. How the product characteristics influence on rate of adoption? 10
3. a) What do you mean by consumer buying behavior? Draw a model of consumer buying behavior. 6
- b) Define segmenting, targeting and positioning? Show the steps of segmenting, targeting and positioning. 7
- c) Why market positioning is an important task of marketers? Imagine a position of a product as a marketer and use marketing mix to support your positioning strategy. 12
4. a) What do you mean by products and services? What are the basic differences between these? 4
- b) What are the levels of products and services? Why should you know the levels of products and services? 6
- c) What is product life cycle (PLC)? Explain the product life cycle including objects and actions in every step. Is PLC same as human lifecycle? 15
5. a) What do you mean by pricing? What are the major pricing strategies? Explain the strategies considering Bangladesh context. 10
- b) What is breakeven point? What are the ways to increase profit margin? PQR company's monthly fixed cost is Taka 600,000; production cost taka 20 per piece; and selling price taka 40 per piece. Estimate its break even volume and return while sales volume is 50,000 pieces. Show in chart after calculation. 15

6. a) What is marketing channel? How channel members add value? 5
b) What is channel conflict? How many conflicts may happen in distribution channel? Is this harmful for business? Explain. 10
c) What is channel level? As a marketing manager show a channel that you want to use for Fresh soyabean oil in Bangladesh? 10
7. a) What do you mean by communication? Draw a communication process and explain. 10
b) What is promotion mix? What are the objectives and tools of advertisement, personal selling, sales promotion and digital marketing? 10
c) What are the ways of promotional budget? How will you set promotional budget for me-too products? 5
8. Prepare the outline or structure of a marketing plan for a new product cellphone or edible oil or electric car. Explain any 2 points of marketing plan. 25

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)

DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination

Summer Semester, A. Y. 2017-2018

Course No. : BTM 4207

Time : 3 Hours

Course Title : Organizational Behavior

Full Marks : 150

There are **8 (eight)** questions. Answer any **6 (six)** questions. All questions carry equal marks. Marks in the margin indicate full marks. Do not write on this question paper.

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1. a) Organizational Behavior (OB) is an applied behavioral science built on contributions from a number of behavioral disciplines- mainly psychology, social psychology, sociology and anthropology. Briefly describe these disciplines and build up their relationship with OB. 10
 - b) A high rate of turnover can disturb the efficient running of an organization when knowledgeable and experienced personnel leave. Research indicates that in general, turnover is significantly harmful for an organizational performance. Develop a plan for deducing employee turnover for a company. 10
 - c) Why organizations consider organizational citizenship behavior (OCB) as an outcome variable of organizational behavior (OB) model? 5
 2. a) Do you think increasing age diversity will create new challenges for managers? What types of challenges do you expect will be the most profound? 10
 - b) Why do renowned organizations use "Wonderlic Cognitive Ability Test"? 5
 - c) What should we do for improving organizational behavior (OB) in Bangladesh? 10
 3. a) If you work at L'oreal, the company's meals, gym, massage service, concierge service, day-nursery and around three months' salary in profit sharing schemes may seem a good reason to be very satisfied with your job. Indeed, L'oreal is among the most sought-after companies to work for, with 1 million applications every year. The 2015 Universum survey, which is conducted yearly in 12 European countries from a sample of 1,68,000 undergraduate business school students, ranked L'oreal as the second most preferred employer in Europe. Innovative recruiting tools such as REVEAL, Brandstorm and Talentube support L'oreal's reputation as an employer of choice by raising youngsters' positive attitudes towards its brands. According to Bocco Chen, Recruitment and Integration Manager at L'oreal Hong Kong, what makes Brandstorm an efficient assessing tool is that competing teams of students from renowned business schools and universities play the role of a brand manager by analyzing market trends and creating products packaging so that they experience real work situations at L'oreal and can connect with their potential future jobs. In France, 90 percent of all new recruits at L'oreal were interns, the reasoning being that internships serve to build future employees' organizational commitment. Before taking up any managerial position, new recruits are all sent on the road for six to twelve months to stack products on shelves at 5am in supermarkets. It is an ordeal. Candidates are 15

reportedly thrown in at the deep end and forced to learn on their own. The job allows little time for socialization outside the organization. Being part of L'oreal has been described as "cult-like". In-the-field initiations serve as filters. You must be highly engaged by your job even if you feel a lack of organizational support, or you will be seen as weak-and the weakest do not last.

Everyone has key objectives and accountabilities. To ensure that employees will be devoted to their job and perform up to its standards, L'oreal has five Development and Learning centers worldwide. Each orealien has personalized access to learning modules that enable them to meet the needs of each function. To track and promote the most talented orealiens, L'oreal has a sharp management and performance appraisal process. Managers with strong potential who have completed several successful projects will be promoted every two or three years.

Indeed, at L'oreal, careers can be built quicker than elsewhere, but you have to first survive several challenges. Managers can be intransigent with employees who are dissatisfied with their jobs and also under perform, for staff satisfaction surveys at L'oreal show these employees often exhibit behaviors that demotivate their colleagues. Twice a year, the L'oreal international brand directors present their launch campaigns. Through this presentation and several others, top managers aim to spread a so-called 'healthy worry' among Orealiens. They also make and break many careers. One Orealien said that she understood what humiliation really meant when she saw a colleagues publically fired during one such meeting. And yet, to her, "L'oreal is worth it".

Questions:

- i. What positive and negative outcomes can L'oreal expect from its Orealiens devotion? To what extent do you think employers should require their employees to be totally devoted to their company?
 - ii. How would you react if one of your peers were humiliated and then fired by your common supervisor during a meeting?
 - iii. How can companies satisfy their employees? Should companies offer their employees the best work conditions or the most challenging responsibilities?
- b) How does the concept of core self-evaluation (CSE) help us to understand personality? 5
 - c) Cognitive evaluation theory suggests that providing extrinsic incentives may undermine intrinsic motivation-justify your statement. 5
4. a) An impressive body of research supports the "Big 5 Personality Model" which proposes five basic dimensions of human personality. From this model you have to discuss about "Dark Side Personality". 10
 - b) The tendency to draw a general impression about an individual on the basis of single characteristics refers to "Halo Effect." Do you think is it unbiased judgment and Why? 10
 - c) How does contrast effect of judgment can distort perception? 5
5. a) Draw the relationship between perception and decision making. Why is perception important in the study of OB? 10
 - b) Discuss about "Kelley's Theory of Attribution". 5

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

FINAL SEMESTER EXAMINATION
 DURATION: 3 Hours

SUMMER SEMESTER, 2017-2018
 FULL MARKS: 150

CSE 4203: Discrete Mathematics

Programmable calculators are not allowed. Do not write anything on the question paper.

There are **8 (Eight)** questions. Answer any **6 (Six)** of them.

Figures in the right margin indicate marks.

1. a) Suppose that a and b are integers where, $a \equiv 11 \pmod{19}$ and $b \equiv 3 \pmod{19}$, find the integer c with $0 \leq c < 19$ such that, 3 × 3
- i. $c \equiv a^3 + b^3 \pmod{19}$
 - ii. $c \equiv 2a + 3b \pmod{19}$
 - iii. $c \equiv a^3 - 4b^3 \pmod{19}$
- b) Find the Octal and Hexadecimal expansion of $(345678)_{10}$. 2 × 4
- c) Compute the summation and multiplication of the following numbers, 8
- i. $(11001)_2$ and $(11011)_2$
 - ii. $(10001)_2$ and $(10101)_2$
2. a) Mr. Luke Skywalker is a leader of the resistance against the empire. He is stranded on a distant planet and now needs help from the resistance for rescuing him. Luke wants to send the message "SABOTAGE EMPIRE" to his friend R2D2 far away in planet Nebula so that the Empire does not understand the message he is sending. Luke has with him his robot friend C-3PO who is able to encrypt and send the message. Your task is to help C-3PO encrypt the message using a hybrid encryption involving Caesar's Cipher first and then Transposition Cipher with the following details in mind, 10
- i. $\sigma = \{1, 2, 3, 4\}$
 - ii. $\sigma(1) = 3, \sigma(2) = 1, \sigma(3) = 4, \sigma(4) = 2$
- b) Prove that, $1^3 + 2^3 + 3^3 + \dots + n^3 = \frac{1}{4}n^2(n+1)^2$ is valid using mathematical induction. 9
- c) The most commonly used procedure for generating pseudorandom numbers is the linear congruential method. We choose four integers: the modulus m , multiplier a , increment c , and seed x_0 , with $2 \leq a < m, 0 \leq c < m$, and $0 \leq x_0 < m$. We generate a sequence of pseudorandom numbers $\{x_n\}$, with $0 \leq x_n < m$ for all n , by successively using the recursively defined function 6
- $$x_{n+1} = (ax_n + c) \pmod{m}.$$
- Based on the following information and considering $m = 9, a = 7, c = 4, x_0 = 3$, find the sequence of pseudorandom numbers generated by the linear congruential method.
- Give a recursive algorithm for finding the reversal of a bit string. Using that algorithm find the reverse of the following bit strings. Show step by step execution of your algorithm. 7 + 4
- i. 101101 +4
 - ii. 101010
- b) If x is a real number then prove that, $\lfloor 2x \rfloor = \lfloor x \rfloor + \lfloor x + \frac{1}{4} \rfloor$ 10

4. Consider the following adjacency matrix of a town map

\therefore	a	b	c	d	e	f	g
a	0	1	0	0	2	0	0
b	1	0	1	0	0	2	0
c	0	1	0	1	2	0	0
d	0	0	1	0	1	0	2
e	2	0	2	1	0	0	0
f	0	2	0	0	0	0	0
g	0	0	0	2	0	0	0

From the above information answer the following:

- a) Draw the graph that is represented by the adjacency matrix. 3
- b) What is an Euler path? Does the above graph have an Euler path or circuit? Explain your answer logically. 2+5
- c) If this graph has an Euler path then find an Euler path for travelling from town a to town e . 3
- d) With the help of Dirac's and Ore's Theorem find whether the graph has a Hamilton circuit or a Hamilton path or both. 6
- e) From the above graph prove that "An undirected graph has an even number of vertices of odd degree." 6

5. a) Consider the following adjacency matrix for a directed graph

\therefore	a	b	c	d	e
a	1	1	1	0	1
b	0	0	0	1	0
c	0	1	1	0	0
d	0	0	1	0	1
e	1	0	0	1	1

From the above information do the following:

- i. Draw the graph represented by the matrix. 2
 - ii. Mathematically show that $\sum_{v \in V} \text{deg}^-(v) = \sum_{v \in V} \text{deg}^+(v) = |E|$. 3
 - iii. Does this graph have a Hamilton path and a circuit? Justify your answer. If there is any Hamilton path and/or circuit then write down the Hamilton path and/or circuit. 5 + 2
- b) Determine whether the pair of graphs in Figure 1 are isomorphic.

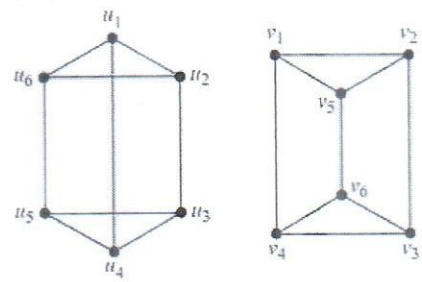


Figure 1: Graph for 5Question .(b)

- c) Draw the following graphs Q_3 , $K_{3,3}$, W_8 , and determine their chromatic number χ . 3

3 × 3

6. a) From Figure 2 generate the sequence of nodes in the following methods of tree traversal:
- i. Pre-order traversal
 - ii. In-order traversal
 - iii. Post-order traversal

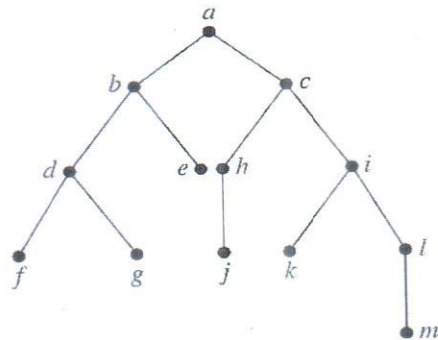


Figure 2: Graph for Question 6.(c)

- b) From the expression $((x + y) \uparrow 2) + ((x - 4)/3)$ do the following:
- i. Draw the tree that represents this expression.
 - ii. Generate the prefix, infix and postfix notation for this expression.
- c) Considering Figure 2, find out the following:
- i. Descendants of nodes *b* and *i*.
 - ii. Ancestors of nodes *m* and *j*

3 + 9

2 + 2

7. a) Using rules of inference show that the premises "A student in this class has not read the book," and "Everyone in this class passed the first exam" imply the conclusion "Someone who passed the first exam has not read the book."

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- b) Draw the combinatorial circuit for the following expressions:
- i. $(p \vee (q \wedge \neg r)) \wedge (\neg q \vee \neg r)$
 - ii. $(p \vee \neg q) \wedge (q \vee \neg r) \wedge (r \vee \neg p)$

2 × 3

- c) Consider that *f* and *g* are the functions from the set of integers to the set of integers defined by $f(x) = \frac{2x+3}{x+2}$ and $g(x) = \frac{3x+2}{x-3}$.

2

Answer the following based on this information:

- i. What is the composition of *f* and *g*?
- ii. What is the composition of *g* and *f*?
- iii. Determine whether *f*(*x*) and *g*(*x*) are one-one functions.

2

8

8. a) A father tells his two children, a boy and a girl, to play in their backyard without getting dirty. However, while playing, both children get mud on their foreheads. When the children stop playing, the father says "At least one of you has a muddy forehead," and then asks the children to answer "Yes" or "No" to the question: "Do you know whether you have a muddy forehead?" The father asks this question twice. What will the children answer each time this question is asked, assuming that a child can see whether his or her sibling has a muddy forehead, but cannot see his or her own forehead? Assume that both children are honest and that the children answer each question simultaneously.

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- b) Devise an algorithm for computing the quotient and remainder in a division operation.
- c) Using the algorithm in 8.(b) find the quotient and remainder if divisor is 5 and dividend is -21. You have to show step by step operation of the algorithm.

10

8