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

DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination   Winter Semester, A. Y. 2018-2019
Course No.   : BTM 4101   Time   : 3 Hours
Course Title   : Principles of Management   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) Management theorists like Frederick Taylor and Frank and Lillian Gilbreth designed   10
        time and motion studies primarily to improve efficiency. Work simplification efforts
        again focused primarily on questions like "How fast can we do task?" A firm likes
        Toyota Motor Corporation which produces high quality products at relatively low
        cost and at the same time making right decisions and successfully implementing
        them.
        How did Toyota Motor ensure that their organizations goals were achieved in an
        efficient and effective manner? Differentiate between 'effectiveness' and
        'efficiency' of any organization from your own point of view.

    b) Management and leadership skills are often used interchangeably as they both   5
        involve planning, decision-making, problem-solving, communication, delegation,
        and time management. Good managers are almost always good leaders as well. In
        addition to leading, a critical role of a manager is to also ensure that all parts of the
        organization are functioning cohesively. According to American social and
        organizational psychologist Robert Katz, identified the three basic types of
        management skills which is necessary for manager should have for effectively
        running the organization. Illustrate these skills with their importance.

    c) Managers are organizational members who are responsible for the work performance   10
        of other organizational members. Managers have formal authority to use
        organizational resources and to make decisions. In Starbucks, there are typically
        three levels of management: top-level, middle-level, and first-level. These three main
        levels of managers form a hierarchy, in which they are ranked in order of
        importance. In most organizations, the number of managers at each level is such that
        the hierarchy resembles a pyramid, with many more first-level managers, fewer
        middle managers, and the fewest managers at the top level. Each of these
        management levels is clarified in terms of their possible job title, their primary
        responsibilities and the paths taken to hold these positions. Explain these three levels
        of management hierarchy with the explanation of their responsibilities.

2. a) "Science may be described as a systematic body of knowledge pertaining to an area of   10
        study and contains some general truths explaining past events or phenomena". 'Art'
        refers to "the way of doing specific things; it indicates how an objective is to be
        achieved." Management like any operational activity has to be an art. Most of the
        managerial acts have to be cultivated as arts of attaining mastery to secure action and
        results. What do you think - management is a science or an art? Justify your answer
        with relevant examples.

b) Maslow's hierarchy of needs is a theory in psychology proposed by Abraham Maslow in his paper in 1943. "A Theory of Human Motivation" in Psychological Review. Maslow subsequently extended the idea to include his observations of humans' innate curiosity. Identify the stages of Maslow's need hierarchy for improving human relations movement of any organization. Discuss. **10**

c) Which of the following individuals contributed to the development of modern theories of management. Describe. **5**

      i) Frederick Winslon Taylor
      ii) Henry Fayol

3. a) Elements of general environment influence all organizations in different ways. Choose any industry and discuss the impact of all elements from the general environment. **10**

b) James D. Thompson recognized the importance of organizations environment. Thompson suggested that the environment can be described along with two dimensions and developed a matrix for measuring the environmental change, complexity and uncertainty. Briefly describe about this matrix and how does this matrix help an organization to cope up with the environmental change? **5**

c) Consider an organization like "Walmart" with which you are familiar. Outline its internal environments in details and identify the implications of "Porters five forces" on "Walmart." **10**

4. a) AT&T was one of those earliest companies that had introduced job enrichment in their organization. For the implementation of job enrichment, they have conducted few experiments. In one experiment eight typists in a service unit prepared customer service orders. Faced with low output and high turnover, management determined that the typist felt little responsibility to clients and received little feedback. The unit was changed to create a typing team. Typists were matched with designated service representative, the task was changed from ten specific steps to three more general steps and job titles were upgraded. As a result the frequency of order processing increased from 27% to 90%, the need for messenger service was eliminated, and accuracy improved and turnover became practically nil. Now a day's most of the organizations are using job enrichment. Job enrichment is an alternative of job specialization. Suppose, you are the CEO of clothing retailer and you want to practice this terminology in your organization.
Show the implications of this job enrichment and ensure that this job enrichment helps you to improve organizational performance. **5**

b) Some people have claimed that the increasing technological sophistication required by many of today's corporations has led to a return to job specialization. In your opinion, what would be the consequences of a sharp increase in job specialization? Consider both positive and negative outcomes in your answer. **5**

c) Determine the six building blocks that managers use for constructing in any organization. **5**

d) Departmentalization can be defined as a grouping of jobs according to some logical arrangement. Define and distinguish between functional and product departmentalization. Identify problems associated with each departmentalization. **10**

5. a) Performing a SWOT analysis helps one thoroughly understand his or her business by 10
        presenting a viewpoint of the company's operations from a different angle. For new
        businesses, this analysis is critical to the organization's planning process. It can,
        however, be performed at any time. Analyze SWOT for two companies namely IBM
        and Apple. Explain how these two organizations use its advantage?

    b) Volkswagon sold its original Beetle automobile in the United States until the 1970s. 10
        The original Beetle was made of inexpensive materials in an efficient way using
        mass production technology. In the 1990s, Volkswagon introduced its new Beetle,
        which has a distinctive style, provides more optional features, and it's priced for
        upscale buyers. What was Volkswagon's strategy with the original Beetle-product
        differentiation, low cost or focus? Which strategy did Volkswagon implement with
        its new Beetle? Explain.

    c) Which strategy should a firm develop first-business level strategy or corporate level 5
        strategy? Describe the relationship between a firm's business and corporate level
        strategies.

6. a) Organizations establish many different kinds of goals. In general, these goals vary by 10
        level, area and time frame. Suppose, some of your friends are interested to open a
        fast food chain restaurant at Dhaka. You may have to develop goals at different
        levels and for different areas. Identify your strategic, tactical and operational goals at
        different levels for opening this restaurant.

    b) Contingency planning is becoming increasingly important for most organizations, 5
        especially for those operating in particularly complex or dynamic environments. Few
        managers have such an accurate view of the future that they can anticipate and plan
        for everything. Contingency planning is a useful technique for helping managers
        cope with uncertainty and change. Crisis management by its very nature, however, is
        more difficult to anticipate. Discuss the following terms:
        i.   Contingency plan
        ii. Crisis management.

    c) A large number of organizations including General Motors, Boeing, and Caterpillar 10
        all use some form of goal setting. As might be expected, goal setting has both
        strength and weakness. By clarifying exactly what is expected, by allowing the
        employee a voice in determining expectations and by passing rewards on the
        achievement of those expectations, organizations create a powerful motivational
        system for their employees. How do you ensure that formal goal setting is an
        effective technique for integrating goal setting and planning?

7. a) Managers make decisions about both problems and opportunities. Making decisions 10
        about how to cut costs by 10 percent reflects an undesirable situation that requires a
        solution. Moreover, decisions are also necessary for gaining opportunity in different
        situations. For availing opportunity or covering problems managers have to take
        decisions in several situations. Critically evaluate the different decision making
        conditions with relevant examples.

    b) Differentiate between Delphi group of decision making and nominal group of 5
        decision making with their pros and cons.

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c) You are a student of the Department of BTM, IUT. After attending a rigorous 10 examination test, you got chance in IUT. At the same time, you got chance in Dhaka University. You have to choose one university to get admitted. Was your decision about choosing BTM a rational decision? Did you go through the steps in rational decision making process? Explain.

8. a) How can a manager determine whether his or her firm needs improvement in 10 'controlling'? If improvement is needed, how can the manager tell what type of control needs improvement?

b) For several years, Pfizer, the world's largest pharmaceutical company, has invested 5 billions of dollars in research and development. In 2009, though, the firm acknowledged that it was not getting an adequate return on its investment. Consequently, Pfizer announced that it was laying off 800 senior researchers. The firm also signaled a strategic reorientation by suggesting it would look for other drug companies to buy in order to acquire new patents and drug formulas. Another company 3M is known for its innovation and product development with staples like scotch tape and post-it notes. As the company began emerging from the recession, it announced that it would increase its R&D spending to $100 million, hire 60 to 80 Ph.D. scientists, and increase capital expenditure to nearly $1.05 billion to come out ahead of weaker competitors. However, the company also worked to reduce its stock keeping units by half to focus only on those products that make up 95% of company sales. From this two cases explain the "integration between strategy and control" from your own point of view.

c) Choose one theory from the content perspectives and one from the process 10 perspectives of motivation. Describe the actions that a manger might take to increase worker motivation under each of the theories. What differences do you notice between these two theories in terms of applications for managers?

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
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DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination   Winter Semester, A. Y. 2018-2019
Course No.   : BTM 4103   Time   : 3 Hours
Course Title : Financial Accounting I   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.

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1. a) John Frank believes that the analysis of financial statements is directed at two   3
        characteristics of a company: liquidity and profitability. Is John correct? Explain.

    b) Using the following data from the comparative balance sheet of Rodenbeck Company,   8
        prepare a schedule showing the **Horizontal Analysis** and **Vertical Analysis**.

	December 31, 2018	December 31, 2017
Accounts receivable	$ 520,000	$ 400,000
Inventory	$ 840,000	$ 600,000
Total assets	$ 3,000,000	$2,500,000

    c) Apple Corporation's comparative balance sheets are presented below: 14

APPLE CORPORATION Balance Sheets December 31		
	2018	**2017**
Cash	$ 4300	$ 3700
Accounts receivable	21200	23400
Inventory	10000	7000
Land	20000	26000
Building	70000	70000
Accumulated depreciation	(15000)	(10000)
Total	$110500	$120100
Accounts payable	$ 12370	$ 31100
Common stock	75000	69000
Retained earnings	23130	20000
Total	$110500	$120100

    Apple's 2018 **income statement** included net sales of $100,000, cost of goods sold of $60,000, and net income of $15,000.

Required:

Compute the following ratios for **2018**.

   i) Current ratio.

   ii) Acid-test ratio.

   iii) Receivables Turnover

   iv) Inventory turnover.

   v) Profit margin.

   vi) Asset turnover.

   vii) Return on assets.

   viii) Return on common stockholder's equity.

   ix) Debt to total assets ratio.

2. a) "A perpetual inventory system provides better control over inventories than a periodic system." Explain.   5

b) The following tables present information related to 2018 for Beximco Company: 20

BEXIMCO COMPANY			
Comparative Balance Sheets			
December 31			
Assets	**2018**	**2017**	**Change Increase/Decrease**
Cash	$191,000	$159,000	$ 32,000 Increase
Accounts receivable	12,000	15,000	3,000 Decrease
Inventory	170,000	160,000	10,000 Increase
Prepaid expenses	6,000	8,000	2,000 Decrease
Land	140,000	80,000	60,000 Increase
Equipment	160,000	0	160,000 Increase
Accumulated depreciation-equipment	(16,000)	0	16,000 Increase
Total	$663,000	$422,000	
Liabilities and Stockholders' Equity			
Accounts payable	$ 52,000	$ 60,000	$ 8,000 Decrease
Accrued expenses payable	15,000	20,000	5,000 Decrease
Income taxes payable	12,000	0	12,000 Increase
Bonds payable	130,000	0	130,000 Increase
Common stock	360,000	300,000	60,000 Increase
Retained earnings	94,000	42,000	52,000 Increase
Total	$663,000	$422,000	

BEXIMCO COMPANY
Income Statement
For the Year Ended December 31, 2018

		$975,000
Revenues		$975,000
Cost of goods sold	$6,60,000	
Operating expenses (excluding depreciation)	176,000	
Depreciation expense	18,000	
Loss on sale of store equipment	1,000	
		855,000
Income before income taxes		**120,000**
Income tax expense		36,000
Net income		**$ 84,000**

Additional information:
i) In 2018, the company declared and paid a $32,000 cash dividend.
ii) Bonds were issued at face value for $130,000 in cash.
iii) Equipment costing $180,000 was purchased for cash.
iv) Equipment costing $20,000 was sold for $17,000 cash when the book value of the equipment was $18,000.
v) Common stock of $60,000 was issued to acquire land.

Required-1: Prepare a Statement of Cash Flows under the Indirect Approach for the Year Ended December 31, 2018.
Required-2: Compute free cash flow.

3. a) Asif Ahmed, a beginning accounting student, believes that double-entry system means each transaction must be recorded twice. Is Asif correct? Explain.   3

b) What is the difference between an Accounts Receivable and Notes Receivable?   5

c) The following selected transactions relate to Staley Company.   17

March 1	Sold $20,000 of merchandise to Canon Company, terms 2/10, n/30.
March 2	Canon returns merchandise worth $2,000 to Staley Company
March 3	Accepted Jenk Inc.'s $4,000, 3-month, 7% note in settlement of a past-due balance on account.
March 11	Received payment in full from Canon Company for balance due.
March 13	Made Staley Company credit card sales for $13,200
March 15	Made Visa credit card sales totaling $6,700. A 3% service fee is charged by Visa.
March 16	Accepted Smart Company's $20,000, 3-month, 9% note for balance due.
April 11	Sold accounts receivable of $8,000 to Federal Factor. Federal Factor assesses a service charge of 2% of the amount of receivables sold.
April 13	Received collections of $8,200 on Staley Company credit card sales and added finance charges of 1.5% to the remaining balances.

May 10	Wrote off as uncollectible $16,000 of accounts receivable. Staley company uses the percentage-of-sales basis to estimate bad debts.
June 3	The Jenk Inc. note was dishonored. Jenk inc. is not bankrupt, future payment is anticipated.
June 16	Collected Smart company note in full.
June 30	Credit sales recorded during the first 6 months total $2,000,000. The bad debt percentage is 1% of credit sales. At June 30, the balance in the allowance account is $3,500.
July 16	One of the accounts receivable written off in May was from J. Simon, who pays the amount due, $4,000, in full.

Required:
Prepare the journal entries for the transactions.

4. a) Which method is favored by the companies in preparing Statement of Cash Flows and Why?   5

b) Newman Hardware Store completed the following merchandising transactions in the month of May, 2018.   20

May 1	Purchased merchandise on account from Jerry's Wholesale Supply $4,200, FOB destination, terms 2/10, n/30. The appropriate party also made a cash payment of $420 for freight on this date.
May 2	Sold merchandise on account $2,100, terms 1/10, n/30, FOB Destination. The cost of the merchandise sold was $1,300.
May 3	Paid freight on May 2 sale $210.
May 5	Received credit from Jerry's Wholesale Supply for merchandise returned $300.
May 8	Received collections from customers billed on sales of $2,100 on May 2.
May 9	Paid Jerry's Wholesale Supply in full.
May 10	Purchased supplies for cash $400.
May 12	Purchased merchandise for cash $1,400.
May 15	Received refund for poor quality merchandise from supplier on cash purchase $150.
May 17	Purchased merchandise from Cosmo Distributors $1,300, FOB shipping point, terms 2/10, n/30. The appropriate party also made a cash payment of $130 for freight on this date.
May 24	Sold merchandise for cash $3,200. The merchandise sold had a cost of $2,000.
May 25	Purchased merchandise from Costanza, Inc. $550, FOB destination, terms 2/10, n/30. The appropriate party also made a cash payment of $55 for freight on this date.
May 26	Paid Cosmo Distributors in full.
May 31	Made refunds to cash customers for defective merchandise $60. The returned merchandise had a scrap value of $10.

Required:
Journalize the transactions using a perpetual inventory system.

5. a) Your friend Murad is confused about the accounts that are closed and the accounts that are not closed. Which chart will you show him?   5

b) The trial balance columns of the worksheet for Edmonds Company at August 31, 2018, are as follows.   20

<div align="center">

EDMONDS COMPANY
Worksheet
For the Month Ended August 31, 2018

</div>

Accounts Title	Trial Balance	
	Dr.	Cr.
Cash	$ 5,400	
Accounts Receivable	2,400	
Supplies	2,800	
Prepaid Insurance	1,300	
Equipment	60,000	
Notes Payable		$ 40,000
Accounts Payable		2,400
J. Edmonds, Capital		30,000
J. Edmonds, Drawing	1,000	
Service Revenue		4,900
Salaries Expense	3,200	
Utilities Expense	800	
Advertising Expense	400	
	$ 77,300	$ 77,300

Other data:
i) Insurance expires at the rate of $200 per month.
ii) $1,000 of supplies are on hand at August 31.
iii) Monthly Depreciation on the equipment is $900.
iv) Interest of $500 on the notes payable has accrued during August.

Required-1: Enter the trial balance on a worksheet and complete the worksheet.
Required-2: Journalize the closing entries from the financial statement columns of the worksheet.

6. a) A cloth store makes a sale of clothes for $1,000 on November 30. The customer is sent   5
a statement on December 5 and a cheque is received on December 10. The cloth store follows Revenue Recognition Principle. When is the $1,000 considered to be earned? Explain the reason.

b) Cash-basis accounting often produces misleading financial statements. Do you agree?   5
Explain the reason.

c) Ken Ham started his own consulting firm, Hambone Company, on June 1, 2018. The 15 trial balance at June 30 is shown below.

HAMBONE COMPANY
Trial Balance
June 30, 2018

Accounts Title	Debit	Credit
Cash	$ 7,150	
Accounts Receivable	6,000	
Supplies	2,000	
Prepaid Insurance	3,000	
Office Equipment	15,000	
Accounts Payable		$ 4,500
Unearned Service Revenue		4,000
K. Ham, Capital		21,750
Service Revenue		7,900
Salaries Expense	4,000	
Rent Expense	1,000	
	$38,150	$38,150

In addition to those accounts listed on the trial balance, the chart of accounts for Hambone Company also contains the following accounts and account numbers: No. 158 Accumulated Depreciation—Office Equipment, No. 212 Salaries Payable, No. 244 Utilities Payable, No. 631 Supplies Expense, No. 711 Depreciation Expense, No. 722 Insurance Expense, and No. 732 Utilities Expense.

Other data:
i) Supplies on hand at June 30 are $600.
ii) A utility bill for $150 has not been recorded and will not be paid until next month.
iii) The insurance policy is for a year.
iv) $2,500 of unearned service revenue has been earned at the end of the month.
v) Salaries of $2,000 are accrued at June 30.
vi) The office equipment has a 5-year life with no salvage value. It is being depreciated at $250 per month for 60 months.
vii) Invoices representing $1,000 of services performed during the month have not been recorded as of June 30.

Required-1: Prepare the adjusting entries for the month of June, 2018.
Required-2: Prepare an adjusted trial balance at June 30, 2018.

7. a) An inexperienced bookkeeper prepared the following trial balance. Prepare a **correct** 5 **trial balance**, assuming all account balances are normal.

KWUN COMPANY
Trial Balance
December 31, 2018

Accounts Title	Debit	Credit
Cash	$14,800	
Prepaid Insurance		$3,500
Accounts Payable		3,000
Unearned Revenue	2,200	
P. Kwun, Capital		13,000
P. Kwun, Drawing		4,500
Service Revenue		25,600
Salaries Expense	18,600	
Rent Expense		2,400
	$35,600	$52,000

b) Moinul Hasan is a licensed dentist. During the first month of the operation of her 20 business, the following events and transactions occurred.

April 1: Invested $40,000 cash.

April 1: Hired a secretary-receptionist at a salary of $600 per week payable monthly.

April 2: Paid office rent for the month $1,000.

April 3: Purchased dental supplies on account from Smile Company $4,000.

April 10: Provided dental services and billed insurance companies $5,100.

April 11: Received $1,000 cash advance from Trudy Borke for an implant.

April 20: Received $2,100 cash for services completed and delivered to John Stanley.

April 30: Paid secretary-receptionist for the month $2,400.

April 30: Paid $1,600 to Smile Company for accounts payable due.

Moinul uses the following chart of accounts: No. 101 Cash, No. 112 Accounts Receivable, No. 126 Supplies, No. 201 Accounts Payable, No. 205 Unearned Revenue, No. 301 Moinul Hasan, Capital; No. 400 Service Revenue, No. 726 Salaries Expense, and No. 729 Rent Expense.

Required:
 i) Journalize the transactions.
ii) Post to the ledger accounts.
iii) Prepare a trial balance on April 30, 2018.

8 a) Can you sell your company's Accounts Receivable? Explain your answer.   5

   b) The following information is related to the sole proprietorship of Larry Smith, attorney.   8

Legal service revenue, 2018	$350,000
Total expenses, 2018	211,000
Assets, January 1, 2018	85,000
Liabilities, January 1, 2018	62,000
Assets, December 31, 2018	168,000
Liabilities, December 31, 2018	85,000

Required:
Prepare the 2018 **Owner's Equity Statement** for Larry Smith's legal practice assuming that the company has Drawing in 2018.

   c) On April 1, Jenny Brown established Jenny's Travel Agency. The following transactions were completed during the month.   12
   i.   Invested $15,000 cash to start the agency.
   ii.   Paid $600 cash for April office rent.
   iii. Purchased office equipment for $3,000 cash.
   iv.   Incurred $700 of advertising costs in the Chicago Tribune, on account.
   v.   Paid $800 cash for office supplies.
   vi.   Earned $11,000 for services rendered: $3,000 cash is received from customers, and the balance of $8,000 is billed to customers on account.
   vii. Withdrew $500 cash for personal use.
   viii. Paid Chicago Tribune amount due in transaction (iv).
   ix.   Paid employees' salaries $2,200.
   x.   Received $4,000 in cash from customers who have previously been billed in transaction (vi).

Required:
Prepare a **tabular analysis** of the transactions using the following column headings: Cash, Accounts Receivable, Supplies, Office Equipment, Accounts Payable, J. Brown, Capital; J. Brown, Drawings; Revenues, and Expenses.

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DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination
Course No.: Math 4161
Course Title: Mathematics I

Winter Semester, A. Y. 2018-2019
Time: 3 Hours
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. a) Sketch the graph of $y = \log_b x$ with b>1 and 0<b<1. If $\log_2 x + \log_4 x = 3$, then determine the value of x. **14**

   b) Write the expression as a single logarithm for the following: **7**
   $$\frac{1}{3}\ln x + 3\ln(x^2) - 2\ln(x-1) - 3\ln(x-2)$$

   c) Define linear and non-linear inequalities. **4**

2. a) When a matrix is said to be invertible? Find the inverse of the matrix given below. **12**
   $$A = \begin{bmatrix} 1 & 0 & -4 \\ -2 & 2 & 5 \\ 3 & -1 & 2 \end{bmatrix}$$

   b) Define rank of a matrix. Find the rank of the following matrix: **13**
   $$\begin{bmatrix} 2 & 1 & 0 & -1 \\ 3 & 4 & 2 & 5 \\ -1 & 0 & 3 & -2 \\ 4 & 1 & 1 & 0 \end{bmatrix}$$

3. a) Solve the following systems of linear equations using a suitable method: **13**
   $$\left.\begin{array}{r} x + y + z = 6 \\ 2x + 3y + 4z = 20 \\ 3x - 2y + z = 2 \end{array}\right\}$$

   b) Reduce the following matrix to echelon form and then to its row canonical form: **12**
   $$A = \begin{bmatrix} 2 & 3 & -2 & 5 & 1 \\ 3 & -1 & 2 & 0 & 4 \\ 4 & -5 & 6 & -5 & 7 \end{bmatrix}$$

4. Find the characteristic polynomial, characteristic roots, eigenvalues and associated eigenvectors of the matrix. **25**
   $$A = \begin{bmatrix} 2 & -3 & 4 & 1 \\ 0 & 3 & 1 & 2 \\ 0 & 0 & 1 & 5 \\ 0 & 0 & -2 & 3 \end{bmatrix}$$

5. a) Write down the general form and standard form of maximization and minimization linear programming problem. Mention three different types of problems where linear programming is applicable.   11

 b) Apply graphical method to solve the following linear programming problem: 14

$$\text{Minimize } z = 2x_1 + 7x_2$$

subject to the constraints

$$5x_1 + 10x_2 \leq 50$$
$$x_1 + x_2 \geq 1$$
$$x_2 \leq 4$$
$$x_1, x_2 \geq 0$$

6. a) Find the optimal solution of the L.P.P. stated below; using Simplex method. Is the solution unique? Give the reason.   19

$$\text{Max. } Z = 20x_1 + 25x_2 - 5x_3 + 30x_4$$

Subject to $3x_1 + 3x_2 + x_3 + 3x_4 \leq 45$

$$x_1 + 2x_2 - 3x_3 + 3x_4 \leq 30$$

$$x_1, x_2, x_3, x_4 \geq 0$$

 b) State the axiomatic rules of probability.   6

7. a) Define conditional probability. The probability that a married man watches a certain TV show is 0.4 and that his wife watches the show is 0.5. The probability that a man watches the show, given that his wife does, is 0.7. Find   13
 (i) The probability that a married couple watches the show.
 (ii) The probability that a wife watches the show given that her husband does.
 (iii) The probability that at least one of the partners will watch the show.

 b) When two events are said to be independent? A fire brigade has two fire engines operating independently. The probability that a specific fire engine is available when needed is 0.99.   12
 (i) What is the probability that an engine is available when needed?
 (ii) What is the probability that neither is available when needed?

8. a) Discuss the concept of random variable with its classification and examples.   9
 b) What is probability density function and probability mass function? Find the value of k for which the function is a density function.   16

$$f(x) = kx, \ 0 \leq x \leq 1$$
$$= k^2, \ 1 \leq x \leq 2$$
$$= -x + 5k, \ 2 \leq x \leq 3$$
$$= 0, \text{ elsewhere.}$$

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ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANIZATION OF ISLAMIC C COOPERATION (OIC)
DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination   Winter Semester, A.Y. 2018-2019
Course No: Hum 4161   Time: 3 Hours
Course Title: Sociology   Full Marks: 150

There are **8 (eight)** questions. Answer **any 6 (six)** questions, All questions carry equal marks.
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1. a) Define globalization. What are the major aspects of globalization?   6

   b) Briefly discuss the economic, cultural, political, and technological process of 9
       globalization in under developed and developing worlds.

   c) Briefly discuss the impacts of globalization on your society.   10

2. a) What do you mean by modernization? What are the social aspects of 10
       modernization? Discuss.

   b) Briefly discuss the characteristics of modernization. What are the impacts of 15
       westernization on your society? Discuss.

3. a) Define culture. Briefly elaborate the following aspects: 14
       i.   Globalization
       ii. Technology
       iii. Material culture
       iv. Non-material culture
       v.   Discovery
       vi. Innovation
       vii. Invention.

   b) Briefly discuss the elements of culture with special reference to your own 11
       society.

4. a) Define poverty, rural development and hunger.   10

   b) Draw the nature of interrelationship between agriculture, rural poverty and 15
       hunger in Bangladesh.

5. a) Define gender, equity and empowerment.   10

   b) Whether women have the equal rights, privileges and empowerment in our 15 society or not? Discuss.

6. a) Define livelihood and sustainable rural livelihood.   10

   b) Briefly discuss the sustainable livelihood approach with special reference to 15 rural Bangladesh.

7. a) Define deviance. Briefly discuss the causes of deviance in your society.   10

   b) Briefly discuss the theories of deviance with suitable examples.   15

8. a) Define social change. Briefly discuss the causes of social change in 12 Bangladesh.

   b) Define research. Briefly discuss the steps of scientific research.   13

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination   Winter Semester, A.Y. 2018-2019
Course Code : Hum 4163   Time   : 3 Hours
Course Title : Business English   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.   Paraphrase the following paragraphs except the topic.   25

Topic: The Good-Better-Best Approach to Pricing by Rafi Mohammed

For decades the auto insurance industry operated on a simple assumption: Consumers are highly price-sensitive, and most will buy the least-expensive plan they can find. But in the early 2000s Allstate conducted some research that caused it to revisit that assumption. Price does matter, it learned, but there's more to the story: Many drivers worry about being hit with premium hikes if they're in an accident. And drivers with clean records want to be rewarded.

Armed with those insights, in 2005 Allstate launched Your Choice Auto. The program relied heavily on modifications to a feature in the company's standard policy (which it continued selling) called accident forgiveness, in which drivers who went five years without accident claims would have no premium increase after their first accident. It introduced a Value plan, priced 5% below Standard, that didn't include accident forgiveness.

Your Choice is a classic example of Good-Better-Best (G-B-B) pricing. There's nothing new about the concept of adding or subtracting product features to create variably priced bundles targeted to customers of varying economic means or those who value features differently. It's been nearly 100 years since Alfred Sloan introduced a "price ladder" to differentiate Chevrolets and Buicks from Oldsmobiles and Cadillacs, creating "a car for every purse and purpose" and powering General Motors to overtake Ford. In the modern era, G-B-B pricing is evident in many product categories. Gas stations sell regular, plus, and super fuel.

Although G-B-B is conceptually simple, implementation can be tricky. If new offerings aren't constructed and priced correctly, existing customers will trade

down, hurting profits. In this article I outline why G-B-B can benefit many firms. Then I present a step-by-step guide to devising, testing, and launching the strategy in a way that boosts profits and reduces the threat of cannibalization.

Most companies could implement some form of G-B-B. Every company already offers the equivalent of a Better offering, and even if some firms can't implement both Good and Best, many could gain new customers, additional revenue, or both by adding either a Good or a Best to their lineup.

2.   Write approximate 300 words on the following topic.   25

Do you think that news should be a balance of both good and bad news? Violence in the media promotes violence in society. To what extent do you agree?

3.   Use any of the appropriate adjectives within the given box to fill in the blanks in   25
the sentences below.

> Hindmost; nugatory; neutered; necessary; gradient; diurnal; beguiles; comity; defile; actuate; nomads; zenith; defensible; diurnal; progenitor; cosmetic; diurnal; deceitful; tacit.

i.   If long circuits were worked direct with ordinary instruments, high battery power would be required in order to send sufficient Single current to ……….. the apparatus.

ii.   The result, if considered alone, inevitably leads to an underestimate of the average amplitude of the regular ……… variation.

iii.   Almost everything in the quaint little town……….., from its architecture to its art to its people.

iv.   The walls of the ghettos had been cast down, but the Jews could find no entry into the ………….. of nations.

v.   The story is that the Romans, entangled in a …………, were suffering from thirst.

vi.   The maximum ………. possible depends on climatic conditions, a dry climate being the most favorable.

vii.   The soldiers fled before the advancing enemy and let the devil take the …………..

viii.   The bill was …………….by the changes made by the legislature.

ix.   So long as a great horde of ……….was encamped on the frontier the country was liable to be invaded by an overwhelming force of ruthless marauders.

x.   Randy continued to talk, more rapidly than………….., mentioning a small wedding.

xi. We may be forced to conclude that the interest of the whole affair, so far as authentic history is concerned, is really ...., and that the romantic imagination has created a mystery in a fact of no importance.

xii. The .... variation showed only a single maximum and minimum, between 5 and 6 P. M.

xiii. The general characteristics of this .... of the horses are those given above as distinctive of the group.

xiv. The tactics in war were the traditional .... tactics of harassing the enemy on the march, constantly retreating before him and avoiding a general engagement.

xv. Despite his urgency, Mr. Tim was immaculately dressed, his silvered hair clashing with features rendered youthful by multiple advanced .... surgeries.

xvi. It is impossible to eradicate the passions; but we must strive to direct them to a noble aim, and it is therefore .... that everyone should be able to satisfy his passions within the limits of virtue.

xvii. It's best to notice patterns in the way that people respond to you to tell if they are truly being................

xviii. Dr Wallich's attribution of this and other specimens subsequently sent in to the genus Camellia, although scientifically.............., unfortunately diverted attention from the significance of the discovery.

xix. Dean asked, a decibel louder than ...., causing a head-turn or two.

xx. It was a ....assumption; however, that is all the information that is already known.

xxi. The sun was well past its .... and headed toward the trees on the west side of the cabin.

xxii. There are two classes of these Indian Fakirs: the religious orders, and the .... rogues who infest the country.

xxiii. She made him what he was, but his suffering was .... to ensure his survival.

xxiv. The .... inequality is shown for " winter " and " summer " respectively.

xxv. A .... ticket.

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4. a) Fill in the blanks in the sentences below with appropriate idioms. 10

      i. The inclination to liken these works to fun-house mirrors lessens as you realize that the opposing curves are as ...., order and chaos, Classicism and Expressionism or even heaven and hell.

      ii. Conventional wisdom used to hold that all diseases eventually evolved toward a more benign state, a .... rationale.

      iii. Our competitors obtained the contract by ....

      iv. A hundred thousand may seem a lot but it's .... compared to the millions that need to be spent.

      v. Mrs Fielding's bound to notice that chipped glass. The woman has ....!

      vi. Tara's always .... by talking about how she couldn't get her hair the way she wanted it.

      vii. Turn left, then just .... and you'll see the shop on your left.

      viii. I try to live by the ....

      ix. After the interview, Jules said that he had a .... that he would get the job this time.

      x. The child was just a .... when we found her.

b) Correct the 10 vocabulary mistakes in the following text. Rewrite the paragraphs 10 below and underline the corrections you have made.

If we want to reduce unemployment, we need to pay workers more money for manual jobs. This will encourage people to work. To what extent do you agree or disagree?

In some countries, employed people are given money by the government to help them until they can find a encourage people to work, however. We also need to consider the working place. We need to ensure that it is safe and comfortable at all times, so that people can feel happy about going to work.

If we want to resolve unemployment from increasing, then we need to do what we can to encourage people to continue working. This situation will not be solved unless we deal with the issue of working conditions as well as money.

c) Write down the correct linking word from the given box. 5

> Unlike, also, what's more, on the other hand, consequently, despite this, as a result of, besides, because, but, so, for example, even though, for this reason, as a result, however, in contrast, in conclusion , therefore, in spite of this, likewise, although, similarly, despite

The purpose of Bridge Hotel report is to learn about the facilities and the services provided at the Bridge Hotel for our travel agency. First of all, the hotel offers a variety of facilities. There's a cosy café, a dinner hall, a large pool, a tennis court, and a luxurious spa. There is (i) _____ a shop on the hotel premises where you can buy souvenirs and small gifts. (ii)_____, the hotel offers a variety of activities, especially during winter months. But, the basic problem is that both the spa and the tennis court are closed to the public (iii) _____ there isn't enough equipment and staff. As far as the staff is concerned, they are very friendly and ready to help guests with any problems that might occur. (iv) _____, they don't always know exactly what they should do because they don't have enough experience. (v) _____, sometimes the meals are served late or the rooms are cleaned up at inconvenient times.

5. Use any of the appropriate word (choose accurate form of Tense) within the given   25
    box to fill in the blanks in the sentences below.

    Do; have; make; get

    i.   I hope to ………… my own business one day.
    ii.   I don't ……… many hobbies.
    iii.   My wife usually ……… the bed, rather than me.
    iv.   Many countries ……… problems with obesity.
    v.   I ……… a mistake in my IELTS reading last time I took the test.
    vi.   I ……… my break at work at 3.15.
    vii.   Reading a lot ……… a real difference to your IELTS score.
    viii.   I'm planning to ……… a holiday in June or July.
    ix.   I ……… my shopping at the weekends.
    x.   I don't ……… much sympathy with students who fail because they did not
            study.
    xi.   1. If someone is ……… a lot of noise I can't concentrate.
    xii.   I don't always ……… time to study
    xiii.   I'll ……… my best in the IELTS test.
    xiv.   I usually ……… the cooking and ironing in our house.
    xv.   You can ……… a lot of money if you are a doctor.
    xvi.   ……… a rest now and again is important if you are studying hard.
    xvii.   You must only ……… business with people you can trust.
    xviii. I ……… a good time on holiday in France.
    xix.   If I ……… nothing I get really bored.
    xx.   Giving money to charity ……… a real difference to my life.
    xxi.   Paul just sits at home all day watching TV. He has no friends and no job.
            He really needs to ……… a life .
    xxii.   You have to ……… permission if you want to leave the exam room.
    xxiii. We're never going to finish this on time - we really need to ……… started.
    xxiv.   Over an hour had passed by the time we ……… off the plane. There was a
            problem with the doors.
    xxv.   I'm starting to ……… excited about my holiday. It is in two weeks time.

6. Write 1 sentence for each of the given adjective.   25

    i.   Abhor   xi.   Advocate   xxi.   Beguile
    ii.   Abortive   xii.   Affluence   xxii.   Benediction
    iii.   Accord   xiii.   Allay   xxiii. Benign
    iv.   Accretion   xiv.   Alleviate   xxiv.   Bizarre
    v.   Acrid   xv.   Amalgamate   xxv.   Bolster
    vi.   Actuate   xvi.   Amass
    vii.   Adage   xvii.   Ameliorate
    viii.   Addle   xviii. Annals
    ix.   Adroit   xix.   Aperture
    x.   Adversity   xx.   Apogee

7. Write approximate 300 words on the following topic.   25

    The claim that animals have rights has been subjected as a matter of debate since
    the 1970's. Are zoos helping or hurting our animals?

    Should zoos be banned? Give justifications on your claim.

8.   Write 1 sentence for each of the given adjective.   25

i.	As blind as a bat	xi.	calculated risk	xxi.	fat cat
ii.	as cool as a cucumber	xii.	chance in a million	xxii.	fishing for compliments
iii.	as dry as dust			xxiii.	follow your nose
iv.	bite hand that feeds you	xiii.	chill out		
		xiv.	clean as a whistle	xxiv.	golden rule
v.	break every rule in the book	xv.	call it a day	xxv.	gut feeling
		xvi.	daylight robbery		
vi.	butter somebody up	xvii.	down to earth		
vii.	beyond your wildest dreams	xviii.	drink like a fish		
		xix.	drop in the ocean		
viii.	buckle down	xx.	eyes like a hawk		
ix.	back into shape				
x.	bag of bones				

BBA in TM, 3rd Sem.   Date: May 27, 2019

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination   Winter Semester, A.Y. 2018-2019
Course Code : BTM 4301   Time   : 3 Hours
Course Title : Management Accounting   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.

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1. a) Define the following terms: differential cost, sunk cost, and opportunity cost.   6
   b) Explain the difference between a product cost and a period cost.   4
   c) Distinguish between discretionary fixed costs and committed fixed costs.   5
   d) Cherokee Inc. is a merchandiser that provided the following information: 10

Items	Amount
Number of units sold	20,000
Selling price per unit	$30
Variable selling expense per unit	$4
Variable administrative expense per unit	$2
Total fixed selling expense	$40,000
Total fixed administrative expense	$30,000
Beginning merchandise inventory	$24,000
Ending merchandise inventory	$44,000
Merchandise purchases	$180,000

   Required:
   i. Prepare a traditional income statement.
   ii. Prepare a contribution format income statement.

2. a) If a company fully allocates all of its overhead costs to jobs, does this guarantee   6
      that a profit will be earned for the period? Discuss.
   b) Sigma Corporation applies overhead cost to jobs on the basis of direct labor   8
      cost. Job V, which was started and completed during the current period, shows
      charges of $5,000 for direct materials, $8,000 for direct labor, and $6,000 for
      overhead on its job cost sheet. Job W, which is still in process at year-end,
      shows charges of $2,500 for direct materials and $4,000 for direct labor.

      Required:
      i. Should any overhead cost be applied to Job W at year-end? If so, how much?
      Explain.
      ii. How will the costs included in Job W's job cost sheet be reported within
      Sigma Corporation's financial statements at the end of the year?
   c) Explain the four-step process used to compute a predetermined overhead rate.   4
   d) Harris Fabrics computes its plantwide predetermined overhead rate annually on   7
      the basis of direct labor-hours. At the beginning of the year, it estimated that

20,000 direct labor-hours would be required for the period's estimated level of production. The company also estimated $94,000 of fixed manufacturing overhead cost for the coming period and variable manufacturing overhead of $2.00 per direct labor-hour. Harris's actual manufacturing overhead cost for the year was $123,900 and its actual total direct labor was 21,000 hours.

Required:
Compute the company's plant wide predetermined overhead rate for the year.

3. a)   Provide two reasons why overhead might be underapplied in a given year.   5
    b)   What is underapplied overhead? Overapplied overhead? What disposition is   6
         made of these amounts at the end of the period?
    c)   Osborn Manufacturing uses a predetermined overhead rate of $18.20 per direct   10
         labor-hour. This predetermined rate was based on a cost formula that estimates
         $218,400 of total manufacturing overhead for an estimated activity level of
         12,000 direct labor-hours.
         The company actually incurred $215,000 of manufacturing overhead and
         11,500 direct laborhours during the period.

         Required:
         i. Determine the amount of underapplied or overapplied manufacturing
         overhead for the period.
         ii. Assume that the company's underapplied or overapplied overhead is closed
         to Cost of Goods Sold. Would the journal entry to dispose of the underapplied
         or overapplied overhead increase or decrease the company's gross margin? By
         how much?
    d)   Larned Corporation recorded the following transactions for the just completed   4
         month.
         i. $80,000 in raw materials were purchased on account.
         ii. $71,000 in raw materials were used in production. Of this amount, $62,000
         was for direct materials and the remainder was for indirect materials.
         iii. Total labor wages of $112,000 were paid in cash. Of this amount, $101,000
         was for direct labor and the remainder was for indirect labor.
         iv. Depreciation of $175,000 was incurred on factory equipment.

         Required:
         Record the above transactions in journal entries.

4. a)   Why is cost accumulation simpler in a process costing system than it is in a job-   5
         order costing system?
    b)   What is meant by the term equivalent units of production when the weighted-   5
         average method is used?
    c)   Maria AM Corporation uses the weighted-average method in its process costing   7
         system. The Baking Department is one of the processing departments in its
         strudel manufacturing facility. In June in the Baking Department, the cost of
         beginning work in process inventory was $3,570, the cost of ending work in
         process inventory was $2,860, and the cost added to production was $43,120.

         Required:
         Prepare a cost reconciliation report for the Baking Department for June.

d) Highlands Company uses the weighted-average method in its process costing 8
system. It processes wood pulp for various manufacturers of paper products.
Data relating to tons of pulp processed during June are provided below:

	Tons of Pulp	% completed Materials	Labor and Overhead
Work in process, June 1	20000	90%	80%
Work in process, June 30	30000	60%	40%
Started into production during June	190000		

Required:

i. Compute the number of tons of pulp completed and transferred out during June.

ii. Compute the equivalent units of production for materials and for labor and overhead for June.

5. a) "Variable costs and differential costs mean the same thing." Do you agree? 4
Explain.

b) "Sunk costs are easy to spot—they're the fixed costs associated with a 5
decision." Do you agree? Explain.

c) Charter Sports Equipment manufactures round, rectangular, and octagonal 16
trampolines. Sales and expense data for the past month follow:

	Total	Round	Trampoline Rectangular	Octagonal
Sales	$1000000	$140000	$ 500000	$ 360000
Variable expenses	410000	60000	200000	150000
Contribution margin	590000	80000	300000	210000
Fixed expenses:				
Advertising—traceable	216000	41000	110000	65000
Depreciation of special equipment	95000	20000	40000	35000
Line supervisors' salaries	19000	6000	7000	6000
General factory overhead	200000	28000	100000	72000
Total fixed expenses	530000	95000	257000	178000
Net operating income (loss)	$60000	$(15000)	$43000	$32000

Management is concerned about the continued losses shown by the round trampolines and wants a recommendation as to whether or not the line should be discontinued. The special equipment used to produce the trampolines has no resale value. If the round trampoline model is dropped, the two line supervisors assigned to the model would be discharged.

Required:

i. What is the financial advantage (disadvantage) of discontinuing the round trampolines? The company has no other use for the capacity now being used to produce the round trampolines. Show computations to support your answer.

ii. Recast the above data in a format that would be more useful to management in assessing the profitability of the various product lines.

6. a) In what way can the use of ROI as a performance measure for investment 3
        centers lead to bad decisions? How does the residual income approach
        overcome this problem?

    b) Westerville Company reported the following results from last year's operations: 22

Sales	$ 1000000
Variable expenses	300000
Contribution Margin	700000
Fixed expenses	500000
Net operating income	200000
Average operating assets	625000

At the beginning of this year, the company has a $120,000 investment
opportunity with the following cost and revenue characteristics:

Sales	$200000
Contribution margin ratio	60% of sales
Fixed expenses	$90000

The company's minimum required rate of return is 15%.

Required:

i. What is last year's margin?

ii. What is last year's turnover?

iii. What is last year's return on investment (ROI)?

iv. What is the margin related to this year's investment opportunity?

v. What is the turnover related to this year's investment opportunity?

vi. What is the ROI related to this year's investment opportunity?

vii. If the company pursues the investment opportunity and otherwise performs
the same as last year, what margin will it earn this year?

viii. If the company pursues the investment opportunity and otherwise performs
the same as last year, what turnover will it earn this year?

ix. If the company pursues the investment opportunity and otherwise performs
the same as last year, what ROI will it earn this year?

x. If Westerville's chief executive officer will earn a bonus only if her ROI
from this year exceeds her ROI from last year, would she pursue the investment
opportunity? Would the owners of the company want her to pursue the
investment opportunity?

xi. Assume that the contribution margin ratio of the investment opportunity was
50% instead of 60%. If Westerville's chief executive officer will earn a bonus
only if her residual income from this year exceeds her residual income from last
year, would she pursue the investment opportunity? Would the owners of the
company want her to pursue the investment opportunity?

7. a) The materials price variance can be computed at what two different points in 5
        time? Which point is better? Why?

    b) What is a quantity standard? What is a price standard? 5

    c) Xavier Company produces a single product. Variable manufacturing overhead 15
        is applied to products on the basis of direct labor-hours. The standard cost card
        for one unit of product is as follows:

Inputs	Standard Quantity or Hours	Standard Price or Rate	Standard Cost
Direct materials	6 ounces	$0.50 per ounce	$3
Direct labor	0.6 hours	$30 per hour	$18
Variable manufacturing overhead	0.6 hours	$10 per hour	$6
Total standard cost per unit			$27

During June, 2,000 units were produced. The costs associated with June's operations were as follows:

Material purchased: 18,000 ounces at $0.60 per ounce	$10800
Material used in production: 14,000 ounces	-
Direct labor: 1,100 hours at $30.50 per hour	$33,550
Variable manufacturing overhead costs incurred	$12,980

Required:
Compute the direct materials, direct labor, and variable manufacturing overhead variances.

8. a) What is a static planning budget?   5
   b) What is a flexible budget and how does it differ from a static planning budget?   5
   c) Harrald's Fish House is a family-owned restaurant that specializes in   15
   Scandinavian-style seafood. Data concerning the restaurant's monthly revenues
   and costs appear below (q refers to the number of meals served):

	Formula
Revenue	$16.50q
Cost of ingredients	$6.25q
Wages and salaries	$10,400
Utilities	$800 + $0.20q
Rent	$2,200
Miscellaneous	$600 + $0.80q

Required:
i. Prepare the restaurant's planning budget for April assuming that 1,800 meals are served.
ii. Assume that 1,700 meals were actually served in April. Prepare a flexible budget for this level of activity.
iii. The actual results for April appear below. Prepare a flexible budget performance report for the restaurant for April.

Revenue	$27,920
Cost of ingredients	11,110
Wages and salaries	10,130
Utilities	1,080
Rent	2,200
Miscellaneous	2,240

BBA in TM, 3rd Sem.   Date: May 29, 2019

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

DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination   Winter Semester, A. Y. 2018-2019
Course No.   : BTM 4303   Time   : 3 Hours
Course Title : Human Resources Management   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) 'Human resource management' denotes a particular way of carrying out the range of activities in an organization. 'Human resource management approach' is something qualitatively different from a 'personnel management approach'. Commentators disagree; however, about how fundamental a shift is signified by a movement from personnel management to human resource management. The rise of HRM in the last two decades of the twentieth century represented something new and very different from the dominant personnel management approach in earlier years. Legge concludes that there is very little difference in fact between the two. Identify the difference between personnel management and human resource management. Discuss the impact of human resource management in today's organization.   10

   b) The HRM function contributes to the achievement of different dimensions of organizational effectiveness. For the past decade the theme dominating the HR research agenda has been the study of links between HR practices and organizational effectiveness. How HRM ensures organizational effectiveness? Describe.   10

   c) Human resource managers are working co-operatively with line managers, help employers to hire and fire employees, administer benefits and conduct appraisals. Now a day some trends are occurring in the environment of human resource management that can shape human resource management (HRM) procedure. Identify the trends which impact on human resource management.   5

2. a) A strategic planning tool shows a "big picture" of how each department's performance contributes to achieving the company's overall strategic goals. In this case, Southwest Airlines uses strategy map for lays out the hierarchy of main activities. It also helps each department (including HR) visualize what it needs to do to support Southwest's low-cost strategy. How did the Southwest Airlines company succeed?   10

   b) A process for assigning financial and nonfinancial goals or metrics to the human resource management–related chain of activities required for achieving the company's strategic aims and for monitoring results. Managers use special scorecard software to facilitate these activities. The computerized scorecard process helps you to quantify the relationships among the HR activities, the resulting employee behaviors and the resulting firm-wide strategic outcomes and performance. How do you create a HR scorecard?   5

   c) After Installing an Authoria ATS (Application Tracking System), the Thomson Reuters Company identifies the recruitment sources, candidate traits and hiring practices that work best in each geographic area where the company does business.   5

This enabled Thomson to reduce metrics like recruiting cost by shifting recruitment dollars from less effective to more effective sources. How can an organization use ATS software for analyzing recruitment effectiveness?

d) One of the challenges that Western Companies face while doing business in Malaysia is to adjust to the work culture of Asia. Failure in understanding this culture would result in problems of sustaining and retaining valuable workforce. How would these cultural differences affect a company's process of selection, training, appraisal and compensation employees? **5**

3. a) Dan Hilbert took over staffing at Valero Energy; he reviewed Valero's projected retirements, growth plans and turnover history. He discovered that projected employment shortfalls were four times as much as Valero could fill with its current recruitment procedures. He formulated new personnel plans for boosting employee retention and recruiting and screening more candidates. For forecasting personnel needs organization uses some basic tools. Identify these basic tools and explain these basic tools help to forecast personnel needs with relevant examples. **10**

b) Filling open positions with inside candidates has some advantages. One executive recruiter said that internal candidates are always better than external ones unless the internal candidates simply can't pass muster. One study concluded that hired CEOs from inside rather than outside performed better. On the other hand, some firms particularly those facing enormous challenges such as IBM and Ford Motor Company did extremely well by hiring outside managers respectively Louis Gerstner and Alan Mullay. Is it better to recruit managers internally or externally? Discuss. **10**

c) Why is having a diverse workforce considered to be advantageous for an organization? **5**

4. a) After reviewing the applicants' resume the manager turns to selecting the best candidate for the job. This usually means reducing the applicant pool by using the screening tools. The purpose of employee selection is to achieve person-job fit. This means matching the knowledge, skills, abilities and other competencies (KSAC) that are required for performing the job with the applicant's KSACs. Why careful employee selection is important for an organization? **10**

b) Assume you are a sales associate at Best Buy store in Miami, Florida. The store sells electronics likes smart phones. Competition comes from other neighborhood retailers and online firms. Many customers who come to your store check the product with you; but eventually many buy it on Amazon. As a sales associate, you are responsible for providing exceptional customer service, demonstrating product knowledge, and maximizing sales. You get a weekly salary with no sales incentive. How would you respond to this situation based on situational judgement test? **5**

c) A simulation in which management candidates are asked to perform realistic tasks in hypothetical situations and are scored on their performance is called management center. For instance, the cheesecake factory created its professional assessment and development center to help select promotable managers. They have included typical simulated exercises. List some tasks for work simulation with examples. **10**

5. a) Citizens banking corporation in Flint Michigan found that 31 of the 50 people in its call center quit in one year, the center's head switched to behavioral clients. Many who left did so because they didn't enjoy irate questions from clients. So she no longer tries **10**

to predict how candidates will act based on asking them if they want to work with clients. Instead she asks behavioral questions based on Vanguard "STAR" technique like tell me about a time you were speaking with an irate person, and how you turned the situation around. This makes it harder to fool the interviewer; only four people left in the following year. In a short explain STAR technique.

b) Pinpoint the factors that can affect an interview's usefulness. 10

c) The most widespread error is that interviews tend to jump to conclusions make snap judgements about candidates during the first few minutes of the interview. Researchers estimates that 85% of the cases, interviewers had made up their minds before the interview even began, based on first impressions the interviewers gleaned from candidates' applications and appearance. Critically evaluate the pros and cons of first impression of judgement interview. 5

6. a) Up to 40 percent of externally hired executives fail within the first 18 months and many others that are recruited from outside the firm leave within five years. Although considerable time, effort, and money are spent recruiting top talent, companies often do a poor job of onboarding. In fact, few companies take the time to familiarize new executives about the workings of the corporate culture beyond the standard, one-size-fits-all orientation session. However, what new executives need to know in order to be effective differs significantly from the focus of most general employee orientation programs.
Why companies can't retain their employees for a long time? Explain. 10

b) The beauty company Loreal's onboarding program takes about 2 years. It includes special training and roundtable discussions, meeting with key insiders, on the job learning, individual mentoring and special experiences such as site visits. Why Loreal invested more time and money for introduction with their employees? 5

c) Assume you are the team leader in the call center of a bank. All employees at the call center are required to undergo training on customer service. You note that your shift has received complaints from customers about miscommunication and rude responses. These complaints were referred to top management and you have been asked to look into thee training needs of the employees. 10

i) What are some of the staffing factors that could have contributed to this problem?
ii) How would you know if it is indeed a training problem

7. a) Performance appraisals mean evaluating an employee's current and past performance relative to his or her performance standards. Many employers use digital tools to automate the appraisal performance management process. With their digital dashboard, these tools monitor report and correct performance deviations in real time. Still employers use some traditional performance appraisal tools. Explain these traditional appraisal tools for measuring employee's performance. 10

b) In a perfect world all employers would use performance appraisal systems with clear goals, fair appraisals, swift feedback and useful coaching. Graphic rating forms in particular are susceptible to several rater error problems; in other words, systematic errors in judgement that occur when people evaluate each other through unclear standards, halo effect etc. Critically evaluate the difference between halo effect and 5

central tendency.

c) Write short notes on: 10
    i) 360 degree feedback performance measurement technique.
    ii) Differentiate between performance appraisal and performance management.

8. a) The challenging thing about managing globally is that what works in one country may   10
not work in another. Not only the distance but also other factors affect international
human resource management. For instance an incentive plan may work in the United
States, but backfire in some eastern European country where workers need a
predictable weekly wage to buy necessities. How does an intercountry difference
affect HRM? Illustrate with examples.

b) What is the role 'management' for maintaining healthy and safety security in an   5
organization following the OSHE standards in Bangladesh?

c) As the HR manager of an international business you have been asked to prepare a   5
briefing for other HR professionals in the business.
Outline the role of HR manager in facilitating future offshoring operations.

d) You have just joined the HR department of a global hotel chain in the Middle East.   5
You note the chain hires French individuals for front of house jobs and Italians for
their kitchen and waiting staff. In terms of recruitment, what does this trend indicate?

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ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

TERM   : FINAL EXAMINATION   WINTER SEMESTER: 2018-2019
COURSE NO.   : **Math 4353** .   TIME   : 3.0 Hours
COURSE TITLE: **Laplace Transformation, Series, PDE**   FULL MARKS: 150

There are **8 (Eight)** questions. Answer any **6 (Six)** questions. Programmable calculators are not allowed. Do not write on this question paper. The figures in the right margin indicate full marks. The Symbols have their usual meaning.

1. (a) Define unit step function. Find the Laplace transform of unit step function.   10
    (b) Solve the following Initial Value Problem by Laplace Transform: 15
    $$y'' + 9y = \cos 2t , \qquad y(0) = 1 , \quad y\left(\frac{\pi}{2}\right) = -1 .$$

2. (a) Find the inverse Laplace Transform of $Y(s) = \frac{3s+1}{(s-1)(s^2+1)}$.   10

    (b) A cantilever beam is clamped at the end $x = 0$ and is free at the end $x = l$.   15
    It carries a load per unit length given by
    $$w(x) = \begin{cases} w_0, & 0 \le x < l/2 \\ 0, & l/2 < x < l \end{cases} . \quad \text{Find the deflection.}$$

3.
    (a) Prove that $J_{-\frac{1}{2}}(x) = \sqrt{\frac{2}{\pi x}}\cos x$.   10

    (b) Find the series solution of the following differential equation about $x = 0$.   15
    $$x^2 y'' - 2xy' + n(n+1)y = 0.$$

    Hence prove that $P_5(x) = \frac{1}{8}(63x^5 - 70x^3 + 15x)$.

4. (a) Prove that the general solution of the linear partial differential equation   10
    $$Pp + Qq = R$$
    is
    $$F(u, v) = 0$$
    where F is an arbitrary function and $u(x, y, z) = c_1$ and $v(x, y, z) = c_2$
    form a solution of the equations
    $$\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R} .$$

    (b) Eliminate the arbitrary function f from the equation   15
    $$f(x^2 + y^2 - z^2 , z^2 - 2xy) = 0$$
    to form a Partial Differential Equation.

5. (a) State Charpit's auxiliary equation to solve nonlinear partial differential equation. Hence solve   8

$$pe^{-x} = qe^{-y} .$$

    (b) Solve $(D_x^2 - D_x D_y - 2D_y^2)z = 3x + 2y$.   8

    (c) Solve $x^2 \dfrac{\partial^2 z}{\partial x^2} - y^2 \dfrac{\partial^2 z}{\partial y^2} = xy^2$.   9

6. (a) A sinusoidal voltage $E \sin \omega t$, where t is time, is passed through a half-wave   15
rectifier that clips the negative portion of the wave. Find the Fourier series of the resulting periodic function

$$u(t) = \begin{cases} 0 & if -L < t < 0, \\ E \sin \omega t & if \ \ 0 < t < L \end{cases} p = \frac{2\pi}{\omega} .$$

    (b) Find the Fourier sine series of   10

$$f(x) = \sin x \ \ (0 < x < \pi).$$

Sketch $f(x)$ and its periodic extensions. Show the details.

7. (a) Derive Fourier Integral from Fourier Series.   15

Find the Fourier cosine integral representation of
$$f(x) = \begin{cases} x & if \ 0 < x < 1 \\ 0 & if \ \ x > 1 \end{cases} .$$

    (b) Define Fourier cosine and Fourier sine transform. Prove that   10

$$\mathcal{F}_c(e^{-ax}) = \sqrt{\frac{2}{\pi}}\left(\frac{a}{a^2 + \omega^2}\right) \ \ (a > 0)$$

8. (a) Prove that   10
       i) $\mathcal{L}\left\{\dfrac{\partial U}{\partial t}\right\} = s\, u(x, s) - U(x, 0)$.
       ii) $\mathcal{L}\left\{\dfrac{\partial^2 U}{\partial x^2}\right\} = \dfrac{d^2 u}{dx^2}$.

    (b) Find the solution of the heat conduction problem   15
$$\frac{\partial U}{\partial t} = \frac{\partial^2 U}{\partial x^2}$$
with the boundary conditions $U(0, t) = 0$, $U(1, t) = 0$, $t > 0$
and the initial condition $U(x, 0) = 3 \sin 2\pi x$, $0 < x < 1$.

Hence interpret your solution physically.

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B.Sc. Engg. (BTM)/ 3rd Sem.   18th May, 2019 (Morning)

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination   Winter Semester: 2018-2019
Course No.: CEE 4361   Full Marks: 150
Course Title: Civil and Environmental Technology I   Time: 3 hours

There are **8 (Eight)** Questions. Answer any **6 (Six)** questions. All questions carry equal marks. Programmable calculators are not allowed. Do not write on this questions paper. The symbols have their usual meaning.

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1.   Concrete mix design is required for a residential building project based on the following data: (25)

Volume ratio of sand to total aggregate=0.44

Air-content= 2% (non air-entrained concrete)

Specific gravity of cement=3.1 (for CEM Type I cement)

Specific gravity of sand (SSD) =2.60

Specific gravity of stone chips (SSD) =2.65

Design compressive strength= 4000 psi

Minimum required slump= 100 mm

Maximum aggregate size= ¾ inch

Bulk unit weight of cement= 1440 kg/m^3

Bulk unit weight of sand= 1600 kg/m^3

Bulk unit weight of stone chips= 1750 kg/m^3

The following graphs are provided :

- Variation of compressive strength (28 days) with W/C (**Fig.1**)
- Variation of cement content with compressive strength (28 days) for different aggregate size and slump value. (**Fig.2**)

Answer the following :

   (i) Calculate the materials required to prepare 6 cylindrical specimens of 6 inch diameter and 12 inch height for testing the trial mix for compressive and tensile strength.

   (ii) Find out the volume ratio of the mix.

2. a) Write down the causes and preventive measures for segregation, bleeding and honeycomb in concrete   (9)

   b) Discuss about the factors affecting strength of concrete (Show graphs where necessary).   (8)

   c) What is shrinkage of concrete? What are different types of shrinkage that occur in concrete?   (3)

d) Describe the working mechanism of superplasticizer and give three examples of mineral (5) admixture used in cement.

3. **a)** Write down the function of sand in mortar and give illustrations of different types of pointing (5) done in masonry work.

b) Write down the compositions of paints, varnish and white wash. (6)

c) What are the causes for different types of defects that may appear on plastering works? (5)

d) The following masses of material are required for 1 m³ of concrete: (9)

Material	Batch mass, kg
Cement	267
Fly ash	89
SSD sand (absorption 1.0 %)	779
SSD stone (absorption 2.0 %)	1150
Total mixing water	190

At the batch plant, the stockpiled sand has a total moisture content of 6.0% and the stone has a total moisture content of 3.0%. Compute adjusted batch masses for aggregate moisture.

4. **a)** What is galvanizing? Describe the mechanism of electroplating and its limitations. (10)

b) Draw a labelled diagram of a typical cross section of timber. (4)

c) Write down the reasons for seasoning and decay of timber. (7)

d) What is vulcanization of rubber? Why it is necessary? (4)

5. **a)** Draw a flow chart showing wet process for manufacturing cement. (6)

b) Write down the reasons for flash setting and false setting of cement. (6)

c) Describe soundness of cement and a test to determine soundness of cement. (9)

d) Write down the mineral constituents of portland cement. (4)

6. **a)** Write down the constituents of brick clay and explain their functions. (7)

b) Explain the harmful constituents of brick. (5)

c) Define frog mark and write down its functions. (3)

d) Write down the characteristics of good bricks. (4)

e) Write down the advantages and disadvantages of Hoffman's kiln and show the comparison (6) betweeen Clamp burning and Kiln burning.

7. The following is the result of sieve analysis of two samples of sand (1250 gms each): (25)

Sieve	Sieve size (mm)	Cumulative amounts retained (gms)	
		Sand sample-1	Sand sample-2
#4	4.75	50	0
#8	2.36	200	50
#16	1.19	300	250
#30	0.60	650	400
#50	0.30	1120	652
#100	0.15	1250	1250

(i) Calculate the combined FM of the two samples.

(ii) Find the mix ratio if the recommended FM is 2.5

(iii) Draw the grading curve for sand sample-2 and comment on its grading.

8. a) What is meant by grade 60 of steel? Draw a stress-strain diagram comparing the concretes having different compressive strength. (5)

b) Define the following mechanical properties of materials: (5)
    i.   Fatigue strength
    ii.   Stiffness
    iii. Ductility
    iv.   Yield strength
    v.   Toughness

c) Due to application of force on a wire of length 1 m and diameter 5 mm the diameter increases by 0.01 mm and the length increases by 2 cm. Find the Poisson's ratio of the material of that wire. (5)

d) Calculate force required to punch a hole of 40 mm diameter in a steel plate of 25 mm thick given that the ultimate shear stress of the steel plate is 60 MPa. (5)

e) A steel column is 3 m long and 0.4 m diameter. It carries a load of 500 kN. Given that the modulus of elasticity is 200 GPa, calculate the deformation of the column. (5)
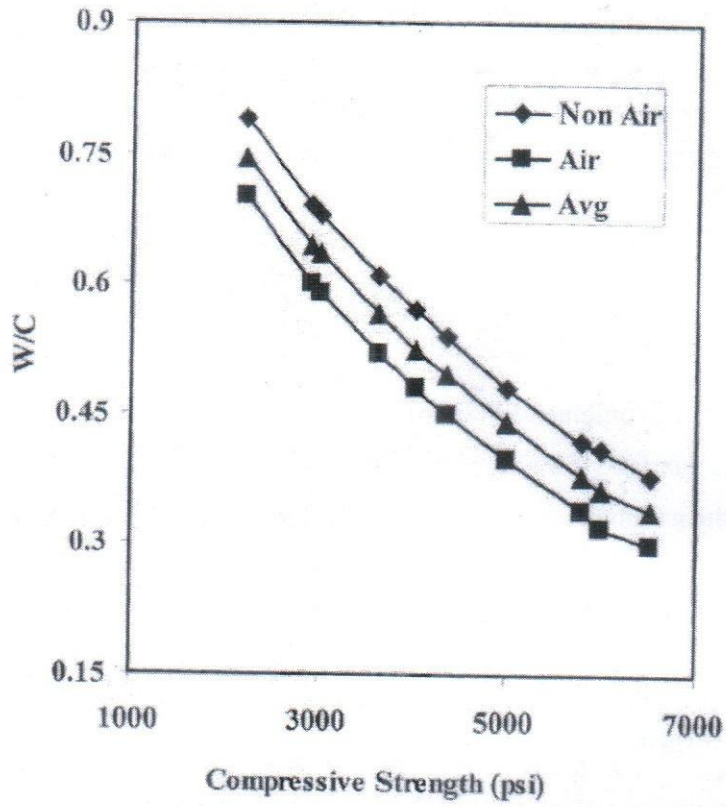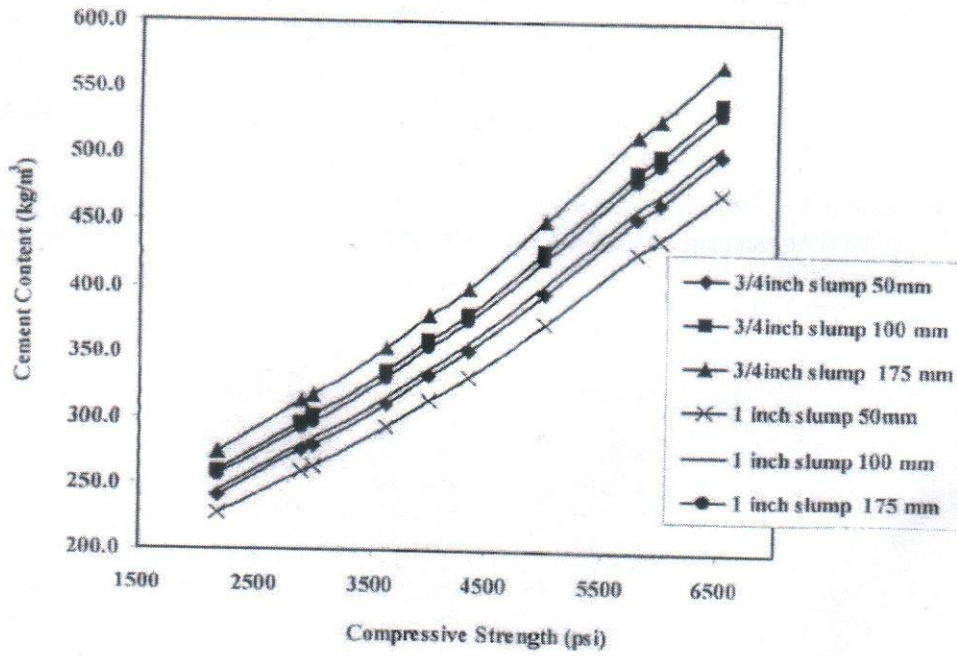
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Fig. 1

Fig. 2

BBA in TM, 3rd Sem.   Date: May 21, 2019

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
DEPARTMENT OF BUSINESS AND TECHNOLOGY MANAGEMENT

Semester Final Examination   Winter Semester, A. Y. 2018-2019
Course No.: Math 4361   Time: 3 Hours
Course Title: Mathematics-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. The Symbols have their usual meanings.

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1. a) A manufacturer shows that the cost of producing x tons of a product (in terms of   10
        thousands of dollars) is:

$$C(x) = \begin{cases} 3x + 5; & if\ 0 \leq x \leq 4 \\ 2x + 6; & if\ 4 < x \leq 8 \\ \dfrac{1}{2}x + 8; & if\ 8 < x \leq 16 \end{cases}$$

    (i) Sketch the graph of C(x).
    (ii) Discuss the continuity and differentiability of the cost function at x = 4 and 8.

    b) Sales of new products often grow rapidly at first and then level off as the market   5
        becomes saturated. Suppose that the daily sales receipts S (in dollars) of a new product
        vary with time according to the formula $S = 5000 - 4000e^{-t}$ where t is the time
        elapsed (in months) after the introduction of the product. What can be said about the
        sales receipts over an extended period of time?

    c) Suppose that an automobile manufacturer finds that the annual profit is given by (in   5
        millions of dollars) $P(x) = 30 + \dfrac{3}{2}(x^2 - 2x)^2$ where x is the amount (in millions of
        dollars) that is spent on advertising. Find the instantaneous rate of change of P(x) with
        respect to x when x = 5.

    d) A stone dropped in a lake produces a circular ripple whose radius increases at a   5
        constant rate of 2 feet per second. How rapidly is the area of the ripple increasing
        when the radius is 10 feet?

2. a) Using L' Hospital's Rule evaluate the following limit   5
        $$\lim_{x \to 0} \frac{e^x - e^{-x} - 2x}{x - sinx}.$$

    b) If $y = a\,cos(lnx) + bsin(lnx)$, then using Leibnitz's Theorem show that   8
        $x^2 y_{n+2} + (2n + 1)xy_{n+1} + (n^2 + 1)y_n = 0.$

    c) Verify Euler's Theorem for the function $u = \dfrac{x^{1/4} + y^{1/4}}{x^{1/5} + y^{1/5}}$ 6

    d) If $u = tan^{-1}\dfrac{x^3 + y^3}{x - y}$ then using Euler's theorem show that $x\dfrac{\partial u}{\partial x} + y\dfrac{\partial u}{\partial y} = sin2u$ 6

3. a) The weekly sales S of a product during an advertising campaign are given by   9
        $S = \dfrac{100t}{t^2 + 100}$, $0 \leq t \leq 20$ where t is the number of weeks since the beginning of the
        campaign and S is in thousands of dollars.
        (i) Over what interval are sales increasing/ decreasing?

(ii) What are the maximum weekly sales?

(iii) Sketch the graph for $0 \le t \le 20$.

b) Suppose, the annual profit for a store (in thousands of dollars) is given by $P(x) = -0.2x^3 + 3x^2 + 6$ where x is the number of years past 2006. If this model is accurate, find the point of diminishing returns for the profit.   8

c) The total revenue in dollars for a firm is given by $R(x) = 8000x - 40x^2 - x^3$, where x is the number of units sold per day. If only 50 units can be sold per day, find the number of units that must be sold to maximize revenue. Find the maximum revenue.   8

4. a) Evaluate (**any three**) from the following: 15

(i) $\int \frac{\sqrt{tanx}}{sinx\,cosx} dx$; (ii) $\int \frac{e^x}{x}(1 + xlogx)\,dx$; (iii) $\int \frac{cosx}{2sinx+3cosx} dx$; (iv) $\int \frac{dx}{3+5cosx}$

b) A manufacturer determines that the marginal cost in dollars is given by $M(x) = x^2 + 3x$. Find the cost function C(x), assuming that the fixed cost (cost when x = 0 units are produced) is $30.   10

5. a) Prove that (if a≠b) $\int e^{ax}sinhbx\,dx = \frac{e^{ax}}{a^2-b^2}(a\,sinhbx - b\,coshbx)$ 9

b) Derive reduction formula for $\int sin^n x\,dx$ and hence evaluate $\int sin^7 x\,dx$ 8

c) Show that $\int_0^1 \frac{logx}{\sqrt{1-x^2}} dx = \frac{\pi}{2}log\frac{1}{2}$ 8

6. a) Evaluate the following: 10

(i) $\int_0^{\pi/2} \frac{sinx}{sinx+cosx} dx$; (ii) $\int_0^{\pi/4} log(1 + tan\theta)d\theta$

b) Find the area under $f(x) = x^{1/3} + 5$ over the interval x = 1 to x = 8.   5

c) At market equilibrium, consumers demand 625,000 gallons of kerosene, which has the demand function $p_d(q) = 25 - 0.6q^{1/2}$, where q is in thousands of gallons and $p_d(q)$ is in dollars per gallon. Compute consumers' surplus.   10

7. a) Find a real root of the equation $x^3 + x^2 - 1 = 0$ using bisection method.   11

b) The following table gives the population of a town during the last six censuses. Estimate, using any suitable interpolation formula, the increase in the population during the period from 1946 to 1948:   14

Year:	1911	1921	1931	1941	1951	1961
Population: (in thousands)	12	15	20	27	39	52

8. a) Write down the fourth order Runge-Kutta method to solve initial value problem.   10

b) Apply the fourth order Runge-Kutta method to solve $\frac{dy}{dx} = x^2 + y^2$, $y(0) = 1$. Take step size h = 0.1 and determine approximations to y(0.1) and y(0.2) correct to four decimal places.   15