Department of Computer Science & Engineering

Begum Rokeya University, Rangpur

1st Year 1st Semester Final Examination – 2013 (Session: 2012–13)

Course Code: **CSE 1101** Course Title: **Computer Fundamentals**

Marks: **50** Time: **03:00 hrs.**

(Answer any Five. Figures in the right margin indicate full marks.)

1.	(a)	Describe four major categories of computer hardware.	2
	(b)	What are the classes of computer based on capacity? Describe with example of each class.	1+3=4
	(c)	Why is it a saying that computer cannot recognize anything but 0's and 1's.	2
	(d)	Why the price of a 2X GB hard disk is less than double the price of an X GB hard disk?	2
2.	(a)	What is Boolean algebra? Mention the importance of Boolean algebra in the design and analysis of digital circuits.	1+2=3
	(b)	Why NAND gate is called universal gate? Realize the logic function $z = \overline{x}y + \overline{y}z + \overline{z}x$ using only NAND gates.	2+3=5
	(c)	Define Arithmetic and Logic Unit.	2
3.	(a)	What is ROM? Write the differences between ROM and RAM.	1+1=2
	(b)	What are sector, cluster and track of the magnetic disk?	2
	(c)	What is optical drive and how does it operate?	1+2=3
	(d)	Calculate the total number of bits in a RAM which can store 201 GB data.	3
4.	(a)	What do you mean by I/O device? Describe the working principle of a keyboard.	1+2=3
	(b)	Describe all techniques for using a mouse.	2
	(c)	Name the four areas created on a magnetic disk during formatting.	2
	(d)	What is computer bus? Describe three types of buses.	3
5.	(a)	Describe all factors which affect processing speed of a computer.	5
	(b)	Define the terms *pixel, dot-pitch, resolution* and *refresh rate*.	0.5x4=2
	(c)	How does a laser printer create an image on paper? Describe with figure.	3
6.	(a)	What is software? What are the types of software? Describe the role of system software in a computer.	1+1+2=4
	(b)	Distinguish between system program and application program.	2
	(c)	What do you mean by multitasking, multiprocessing and multithreading.	3
	(d)	Define *PC* and *PC Clone*.	1
7.		Write short notes on the following topics.	2.5x4=10

a) WAN
b) 3G
c) CPU
d) e-mail

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Semester Final Examination-2013 1st year 1st Semester Year Session: 20012-2013

Course Title: Electrical Circuit Analysis Course Code: CSE 1103

Time: 3.0 Hours Full Marks: 50

[N.B. ***Answer any Five (5) Questions, Number of each question is indicated to the right***]

1. (a) Write the difference between resistor, capacitor and inductor. 3

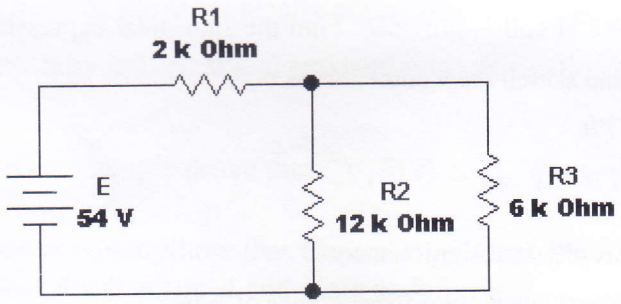
(b) State and explain KVL with proper circuit diagram. 1+3=4

(c) Calculate the voltage drops across R_1 and R_2, those are connected in series with a source E. 3

2. (a) Define series and parallel circuit with proper circuits. 2

(b) Prove that "the current through any parallel branch is equal to the product of the total resistance of the parallel branches and the input current divided by the resistance of the branch through which the current is to be determined." 4

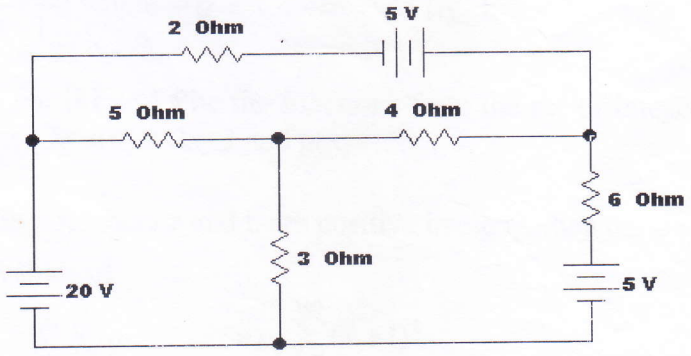
(c) Calculate the current flowing through R_3 in the given circuit. 4



3. (a) Define current source and voltage source. Explain how a voltage source with source resistance can be converted into an equivalent current source. 2+2=4

(b) Explain Nodal analysis method for dc circuit. 3

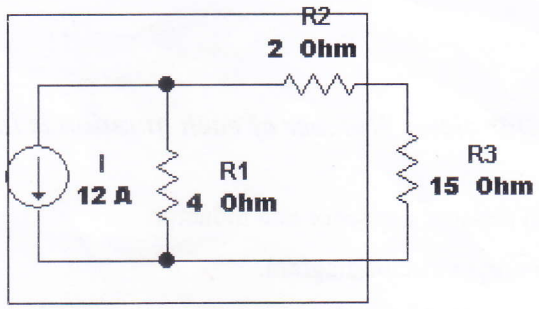
(c) Using mesh analysis find the current through 4Ω resister. 3



4. (a) Write the different network theorem for dc network analysis. 2

(b) State and explain Thevenin's theorem. 4

(c) Find the Thevenin equivalent circuit for the below network in the shaded area of the network. 3



5. (a) Define ac current and a voltage. 2

(b) Write the general form of sinusoidal ac voltage and ac current and explain its different terms. 1+2=3

(c) Calculate the effective value of ac voltage and ac current. 5

6. (a) Explain the response of basic R, L and C elements to a sinusoidal voltage and current with input and output wave forms. 2×3=6

(b) The current through a 0.2 H coil is provided. Find the sinusoidal expression for the voltage across the coil and sketch the v and I curves. 4

(i) $i = 15 \sin 377t$

(ii) $I = 8 \sin (377t-70)$

7. (a) Define Q factor. Write its physical significance. 1+1=2

(b) What do you mean by filter? What are different types of filter? 1+2=3

(c) Explain the frequency response of R-C low pass filter with proper diagram. 5

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1st Year 1st Semester Final Examination – 2013(Session: 2012–13)

Course Code: **CSE 1105** Course Title: **Discrete Mathematics**

Marks: **50** Time: **03:00 hrs.**

(Answer any Five. Figures in the right margin indicate full marks.)

1. (a) Let p and q be the propositions **5**

p : You score 7 in IELTS

q : You get a scholarship in UK

Write these propositions using p and q and logical connectives.

i) You score 6 in IELTS.

ii) You score 7 in IELTS, but you do not get scholarship in UK.

iii) You will get a scholarship in UK if you score 7 in IELTS.

iv) If you do not score 7 in IELTS, then you will not get a scholarship in UK.

v) Scoring 7 in IELTS is sufficient for getting a scholarship in UK.

(b) What is implication and contrapositive of an implication? Give examples of each. **2**

(c) What is tautology? Determine whether $(\neg p \wedge (p \rightarrow q)) \rightarrow \neg p$ is a tautology. **3**

2. (a) What is logical equivalence? Determine whether (a → b) → (c → d) and (a → c) → (b → d) are not logically equivalent. **3**

(b) What do you mean by universal and existential quantification? Give examples of each. **3**

(c) With the help of an example prove that $\neg \forall_x P(x) \Leftrightarrow \exists_x \neg P(x)$ **4**

3. (a) Define *Cartesian product*. Show that *Cartesian product B x A* is not equal to the *Cartesian product A x B* where *A* and *B* are as follows: **3**

$A = \{ p,q \}$

$B = \{ a, b, c \}$

(b) What is cardinality of a set? Find out the cardinality of the set $\{\Phi, \{ \Phi\}\}$ **1+1=2**

(c) Determine the type of each of the following functions. **0.5x4=2**

(i) $f(x) = \sqrt{x+5}$; where $-\alpha < x < +\alpha$ (ii) $f(x) = x^2 - 1$; where $0 \le x < \alpha$

(iii) $f(x) = \dfrac{x^2-1}{x-1}$; where $-\alpha < x < +\alpha$ (iv) $f(x) = 1$

(d) Find *top* and *pot* if t and p be the functions from the set of integers to the set of integers defined by $t(x) = 2x+3$ and $p(x) = 3x + 2$. **2+1=3**

4. (a) Prove that if n=ab, where a and b are positive integers, then $a \le \sqrt{n}$ or $b \le \sqrt{n}$. **3.5**

(b) Find out the values of **3.5**

i) $\sum_{i=1}^{4} \sum_{j=1}^{3} ij$ ii) $\sum_{50}^{100} (x+1)^2$

(c) Describe arithmetic and geometric expression with suitable examples.

(d) Find the base 6 expansion of $(1234)_{10}$.

5. (a) What is Mathematical Induction? Write down the principles of mathematical induction. 3

(b) Use mathematical induction to show that 4
$1 + 2 + 22 + \ldots + 2n = 2n+1 - 1$ for all nonnegative integers n.

(c) What is cardinality? 1

(d) Define *Fibonacci numbers*. Show that *Fibonacci numbers* follows recursion. 2

6. (a) Show all the steps used by the binary insertion sort to sort the list 3, 2, 4, 5, 1, 6? 4

(b) List all the steps used to search for 9 in the sequence 1,3,4,5,6,8,9,11 6
i) a linear search ii) a binary search

7. (a) State and prove the *generalized pigeonhole principle*. 2+2=4

(b) Define each of the following with examples. 1.5x4=6

(i) cycle (ii) complete graph (iii) degree of a vertex (iv) path

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1st Year 1st Semester Final Examination, 2013.

Course Title: Communicative English
Course Code: CSE1106 **Full Marks: 50**

(Note: Numbers in the right margin indicate marks for each question.)

1. Read the passage given bellow: 5

A recent investigation by the scientist at the U.S. geological survey shows that strange animal behavior might help predict earthquakes. Investigation found such occurrences within a 10 km radius of the epic centre of a fairly recent quake. Some birds screeched and flew about wildly; dogs yelped and flew around uncontrollably.

Scientists believe that animals can perceive environmental changes several hours or even days before mishaps. Animal were noted as being restless for several week before a Tashkent, Uzbekistan earthquake. An hour before the disaster, domestic animals refused to go indoor and dogs howled and barked furiously, in 1960, earthquake stroke Agadir in Morocco, survivors recall that stray animal, including dogs were seen streaming out of town before the earthquake.

Unusual animal behavior preceding earthquakes has been noted for centuries. British Admiral Robert Fitzroy reported huge flocks of screaming seabirds other concepcions, Chile in 1835. An hour nad a half later, dogs were seen fleeing, and ten minutes later the town was destroyed. In 1976, after monitoring bizarre animal behavior, the Chinese predicted a devastating earthquake. Although hundreds of thousands of people were killed, the government was able to evacuate millions of people and thus keep the death toll at a lower level.

Answer the following questions:

a) What kind of predictions may be made by observing animal behavior?
b) Why are animals aware , according to another , of an impending danger?
c) What do you know about the weird animal behavior in Morocco before the earthquake struck in 1960?
d) What did the British Admiral Robert Fitzroy notice in Chile?
e) What is the gist of the passage? Give an appropriate title of it?

2. Use the right form of verbs: (any five) 5

a) Janet ------- (wait) for me when I -------- (arrive).
b) Where ------- (have/has) you (be)? ----- (you/May) tennis?
c) The train ------- (be) never late. It always ------ (have) on time.
d) ----- (you/listen) to the radio? 'No, you ----- (turn) it off.
e) I ------ (be) in a hurry, so I ----- (have) time to call you
f) I was sad when I ---------(sell) my car. I ---- (have) it for long time.

3. Make sentences with the following structure (two sentences per structure): (any five) 5

a) Sub + V_L + Adj / Adeverbial
b) Sub + V_L + Complement + Adverb
c) Sub + V_T + Indirect object + Direct object + Adv
d) Sub + V_L + Complement (Adj + Adv)
e) Sub + V_T + Direct object + Object Complement
f) There + V_L + Sub + Complement
g) Sub + V_T + Direct object + Adverb

4. Write the WH-questions for the following statement: (any five) 5

a) You were attending kanak.
b) The accident caused the injury.
c) The movie was really exciting.

e) The shoe is worth 15000 BDT.
f) Tisha betrays Nahin casually.
g) Nehal asked for the chairmn's book.

5. Make the sentences to express each of the following emotions/ attitude using the appropriate Modal Auxiliary: (any five)

a) Possibility
b) Recommendation
c) Advice
d) Logical Conclusion
e) Assumption
f) Complete obligation
g) Preference

6. Fill in the gaps with appropriate prepositions: (any five) 5

a) The University is ----- the street.
b) He is healed --------- B virus.
c) The rules are not subject -------- changes.
d) Would it be interesting ---------- ask why you are leaving?
e) The physician cured him ---- the disease.
f) Put your pens.
g) The boy is accurate ------- his calculation.
h) A question ----- this point seems valid.

7. Change the voice of the following statements: (any five) 5

a) We ought to abide by the law and order system of our country.
b) Open the door.
c) Did Euna send you an e-mail?
d) The man showed his true color.
e) They made the party enjoyable last time.
f) Do you like coffee?
g) He was about to give her a slap.
h) Nishad will finish the work by December.

8. Make the sentences with the following phrasal verb and idioms: (any five) 5

Turn out, in the nick of time, off an on, take one to task, losing ground, out of date, coming to the front, take to ones heels.

9. Write compositions on any of the following topics: 10

a) Cybercrime
b) The impact of Hartal on students life
c) The celebrity you admire most.

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1st Year 1st Semester Final Examination, 2013.

Time: 3.00 hours
Full Marks: 50

Course Title: Linear Algebra & Geometry
Course Code: CSE1107

Answer any five form the given questions
(Note: Numbers in the right margin indicate marks for each question.)

1. (a) What do you mean by transformation of co-ordinates? The equation $3x^2+2xy+3y^2-18x-22y+50=0$ is transformed to $4x^2+2y^2=1$ when referred to rectangular axes through the point (2,3). Find the indication of the latter axes to the former. 5

   (b) Show that the homogeneous equation $ax^2+2hxy+by^2=0$ always represents a pair of straight lines. Hence find the angle between these two lines. 5

2. (a) Find the condition to remove the xy-term from the expression $ax^2+2hxy+by^2=0$. Determine the equation of parabola $x^2-2xy+y^2+2x-4y+3=0$ after rotating the axes through 45°. 5

   (b) Find the area of the triangle formed by the lines $ax^2+2hxy+by^2=0$ and $lx+my+h=0$ 5

3. (a) Find the equation of the direct common tangents to the circles $x^2+y^2=16$ and $x^2+y^2+6x-8y=0$. 5

   (b) Find the locus of the middle points of the chords of the circle $x^2+y^2=a^2$ which subtend a right angle at the origin. 5

4. (a) Find the equation of the circle which has for its diameters chord cut off on the line $3x+2y=6$ by the circle $x^2+y^2=16$. 5

   (b) What do you mean by limiting point? Prove that the limiting points of the system $x^2+y^2+2gx+c+\lambda(x^2+y^2+2fy+k) = 0$ subtend a right angle at the origin if $\frac{c}{g^2}+\frac{k}{f^2}=2$. 5

5. (a) Define symmetric and skew symmetric matrices. Show that every square matrix can be represented by the sum of hermitian and skew hermetian matrices. 5

   (b) What do you mean by transpose of matrix? Show that $(AB)^T = B^T A^T$ where A and B are two non zero matrices. 5

6. (a) What do you mean by echelon form of a matrix? Reduce the matrix

$$A=\begin{bmatrix}1 & 1 & 4 & 6\\ 3 & 2 & -2 & 9\\ 5 & 1 & 2 & 13\end{bmatrix}$$ to echelon form 5

   (b) Solve the following system of equations:
   $x+2y-z=3$
   $x+3y+z=5$
   $3x+8y+4z=17$

7. (a) Find the bisectors of the angle between the lines represented by $ax^2+2hxy+by^2 = 0$.

   (b) Prove that the straight lines represented b the equation $Ax^2+2hxy+by^2+2gx+2fy+c=0$ will be equidistant from the origin, if $f^4 - g^4 = c(bf^2 - ag^2)$.