Heaven's Light is Our Guide

RAJSHAHI UNIVERSITY OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
1st Year Odd Semester Examination 2017

COURSE NO: Hum 1113 COURSE TITLE: Functional English

FULL MARKS: 70 TIME: 3 HRS

N.B. (i) Answer any SIX questions taking any THREE from each section.
(ii) Figures in the right margin indicate full marks.
(iii) Use separate answer script for each section.

SECTION : A

Q.1. (a) Explain the following terms related to sentence construction: subject, object and complement. 4

(b) What are the features of verbs? Mention basic verb combinations. 4

(c) Discuss finite verbs and sentence types according to syntactic structure. 4

Q.2. (a) Write note on "questioning". 5

(b) What is allophone? Make differences between phonetics and phonology. 4

(c) "I am an engineering student"- comment this statement into IPA. 3

Q.3. (a) Translate the following sentence according to direction: 6

(i) Everyone knows him (Interrogative)
(ii) Only Sabbir can play good cricket (Negative)
(iii) He is rich, yet he is not contended (Simple)
(iv) The man, being very hungry, ate too much (Compound)

(b) How does Fish-bone concept help to design argumentative writing/structured essay? Explain. 6

Q.4. (a) How does phrase differ from clause? 3

(b) "Nothing is free in this world; even the affection of a mother" what extent do you agree or disagree? Explain. 9

SECTION : B

Q.5. (a) What are the techniques of reading? Explain. 6

(b) Write a precis of the following passage - 6

Teaching is the noblest of professions. A teacher has a sacred duty to perform. It is he on whom rests the responsibility of molding the character of young children. Apart from developing their intellect, he can inculcate in them qualities of good citizenship, remaining neat and clean, talking decently and sitting properly. These virtues are not easy to be imbibed. Only he who himself leads a life of simplicity, purity and rigid discipline can successfully cultivate these habits in his pupils.

Besides a teacher always remain young. He may grow old in age, but not in spite. Perpetual contact with budding youths keep him happy and cheerful. There are moments when domestic worries weight heavily on his mind, but the delight company of innocent students makes him overcome his transient moods of despair.

Q.6. (a) Suppose you are a job-seeker. Now write a cover letter based on an imaginary job advertisement. 6

(b) Explain different types of conditionals with appropriate examples. 6

Q.7. (a) What is plagiarism? Discuss different parts of a report. 5

(b) Write a memo announcing a meeting. 7

Q.8. (a) How does Orwell's "Shooting an Elephant" portray the colonial attitude, culture and atmosphere? Discuss and provide relevant reference from the text. 12

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Rajshahi University of Engineering & Technology

B.Sc. Engineering 1st Year Odd Semester Examination, 2017

Department of Computer Science & Engineering

Course no **Math-1113** Course Title **Differential and Integral Calculus**

Full marks 72 Time Three (03) hours

N.B. Answer six questions, taking **three** from each section
The questions are of equal value
Use separate answer script for each section

SECTION-A

Q1 (a) Define limit of a function. A function $f(x)$ is given that 6

$$f(x) = x \sin\frac{1}{x} \quad \text{for } x \neq 0$$

$$= 0 \quad \text{for } x = 0.$$

Show that $f(x)$ is continuous at $x=0$ but its derivative does not exist

(b) If 6

$$f(x) = \begin{cases} -\frac{x^2}{2} & \text{for } x \leq 0 \\ x^n \sin\left(\frac{1}{x}\right) & \text{for } x > 0 \end{cases}$$

Find whether $f'(x)$ exists for $n=1$ and 2 or not

Q2 (a) If $y=(x^2-1)^n$, then prove that 6

$(x^2-1)y_{n+2}+2xy_{n+1}-n(n+1)y_n=0$

(b) State and prove Rolle's theorem 6

Q3 (a) Examine whether $x^{1/x}$ possesses a maximum or a minimum and determine the same. 6

(b) Evaluate $\lim_{x\to\infty}\left(\frac{\tan x}{x}\right)^{1/x}$ 6

Q4 (a) If V be a function of x and y, prove that 6

$$\frac{\partial^2 V}{\partial x^2}+\frac{\partial^2 V}{\partial y^2}=\frac{\partial^2 V}{\partial r^2}+\frac{1}{r}\frac{\partial V}{\partial r}+\frac{1}{r^2}\frac{\partial^2 V}{\partial \theta^2}$$

(b) Define radius of curvature. Find the radius of curvature at the origin of $4x^4+3y^3-8x^2y+2x^2-3xy-6y^2-8y=0$ 6

SECTION-B

Q5 Integrate the following integrals (any three) 12

i) $\int\frac{x^2+1}{\sqrt{x^2+4x+20}}dx$, ii) $\int\frac{dx}{a+b\cos x}$, iii) $\int\frac{dx}{(1+x)\sqrt{1+x-x^2}}$

iv) $\int(2x+1)\sqrt{2x^2-8x+5}\,dx$

Q6 (a) Evaluate: $\lim_{n\to\infty}\{(1+\frac{1}{n})(1+\frac{2}{n})\cdots(1+\frac{n}{n})\}^{1/n}$ 4

(b) Show that $\int_0^1\frac{\log(1+x)}{1+x^2}=\frac{\pi}{8}\log 2$ 3

(c) Find the reduction formula for $\int\tan^n\theta\,d\theta$ and then also evaluate $\int_0^{\frac{\pi}{4}}\tan^5\theta\,d\theta$ 5

Q7 (a) What are the Beta and Gamma functions? Show that $\Gamma\left(\frac{1}{2}\right)=\sqrt{\pi}$. 4

(b) Show that $\int_0^1\frac{x^2dx}{(1-x^4)^{\frac{1}{2}}}\times\int_0^1\frac{dx}{(1+x^4)^{\frac{1}{2}}}=\frac{\pi}{4\sqrt{2}}$ 5

(c) Evaluate $\int_0^{\infty}\frac{x^4}{(1+x^5)^5}dx$ 3

Q8 (a) Find the area of the segment of the parabola $y^2=(x-1)(4-x)$ cut by the x-axis 6

(b) Find the volume and surface area of the solid generated by revoluting the cycloid $x=a(\theta+\sin\theta)$ and $y=a(1+\cos\theta)$ is about its base 6

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RAJSHAHI UNIVERSITY OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
1st Year Odd Semester Examination 2017

COURSE NO: CSE 1101 COURSE TITLE: Computer Programming

FULL MARKS: 70 TIME: 3 HRS

N.B. (i) Answer any SIX questions taking any THREE from each section.
(ii) Figures in the right margin indicate full marks.
(iii) Use separate answer script for each section.

SECTION : A

Q.1. (a) Explain briefly (i) compiler (ii) interpreter and (iii) object file. 6

(b) Find the value of the expression, $-13\%4 > 4/8 - 1$. 2

(c) Find the output when the following statement is executed if $a = 10$ and $b = 20$. 2
printf("%d", (b-a) ? a+b : a-b);

(d) Write down the meaning of the following escape sequence (i) /? (ii) /a (iii) /n and (iv) /v 2

Q.2. (a) Write a program to find out the interest charged in installments for following case. 6
A desktop computer costs 30000 BDT. A salesman sells it for 10000 BDT for next 6 months. What is the monthly interest charged?

(b) The wind chill index (WCI) is calculated from the wind speed v and the temperature t. Three formulas are used, depending on the wind speed 6
if $(0 \le v \le 4)$ then $WCI = t$,
if $(v \ge 45)$ then $WCI = 1.6t - 55$
otherwise $WCI = 91.4 + (91.4 - t)(0.0203v - 0.304\sqrt{v} - 0.474)$
Write a program that can calculate WCI using v and t.

Q.3. (a) What will be the output of the following programs: 6

(i)
```
void main(){
int a=b=c=10;
a=b=c=50;
printf("\n %d %d %d", a, b, c);
}
```

(ii)
```
#define SQUARE(X) X*X
void main(){
printf("\n square = %d", SQUARE(10+2));
}
```

(iii)
```
void main(){
int x;
x=printf(" I see, Sea in C");
printf("\n x=%d", x);
}
```

(iv)
```
void main(){
printf("\n %d %d %d", 10 & 20, 10/20);
}
```

(b) Find the output of the following program segment: 4
```
int i=1;
while(1){
printf("%d", i++);
if(i>3) break;
printf("*");
}
```

(c) What are the differences between continue and break statement? 2

Q.4. (a) Differentiate between local and global variable with an example. 2

(b) Let ax[] is defined as 6
int ax[5] = {10, 20, 30, 40, 50};
and if int *p = &ax[2];
then find (i) *(p+2) (ii) (p-3) (iii) *p++ if &ax[0] = 2262H. 6

(c) Write a program to find the common elements between arrays ax[50] and bx[50]. 4

SECTION : B

Q.5. (a) Write a program to find out the amount of load-shading on a given day of a region. The conditions are: 5

(i) A city is divided into regions with different priorities.
(ii) Region with highest priority will have lowest amount of load-shading (hour) and vice-versa.
(iii) The amount of load-shading is pre-allocated for a given region on a specific day of a week.

(b) Given three variable x, y and z, write a function to circularly shift their values. In other words if x=5, y=6 and z=7, after circular shift y=5, z=6 and x=7. Call the function with variables a, b and c to circularly shift their values. 4

(c) Write and test the following power() function that returns raised to the power double power(double, int); 3

Q.6. (a) Explain with example of the followings: 3
(i) call by value (ii) call by reference

(b) Write the heading of the following functions: 4.5
(i) Function "abc" accepts one integer and one char and return a double.
(ii) Function "def" accepts a pointer to char and returns nothing.
(iii) Function "ghi" accepts nothing and returns a pointer to float. $4\frac{1}{2}$

(c) Write a program that generates 10 unique numbers between 10 and 100 randomly. 4.5 $4\frac{1}{2}$

Q.7. (a) What value is stored in the memory if we press "B" from keyboard. 2

(b) Explain the function of the following function with example. 4
(i) strcmp() and (ii) strcpy()

(c) Write a program that reads a string from keyboard and checks the number of occurrence of character 's' and 't'. 6

Q.8. (a) Given a text file, create another file deleting all the vowels (a, e, i, o, u). 4

(b) Write a program which will read a line and delete from it all occurrences of the word "the". 4

(c) Explain the array of structures and write a program to accept record of 15 persons which has name, age and address and also display them. 4

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Rajshahi University of Engineering & Technology

B Sc. Engineering 1st Year Odd Semester Examination, 2017

Department of Computer Science & Engineering

Course no: **EEE 1151** Course Title: **Basic Electrical Engineering**

Full marks: 72 Time: Three (03) hours

N.B. Answer **six** questions, taking **three** from each section
The questions are of equal value.
Use separate answer script for each section.

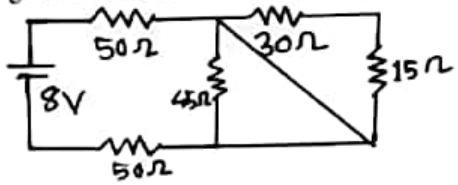
SECTION-A

Q1. (a) Define electrical circuit? Draw the resistance versus temperature graph. 4

(b) A 1200 watt hair dryer plugged into a 120 volt circuit. What is the current drawn by the hair dryer? 3 3

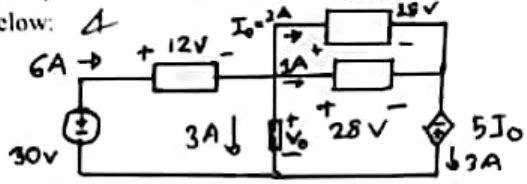
(c) A 95 watt TV is plugged into a 115 volt circuit. The TV operates for 120 minutes. If the cost of energy is 5 BDT per KW-hr, how much does it cost to run the TV for 120 minutes? 3 3

(d) Determine the current through the resistances of the following circuit. 2

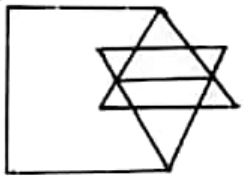


Q2 (a) Define independent and dependent source? Also classify them. 3 3

(b) Find v_0 in the circuit below: 4

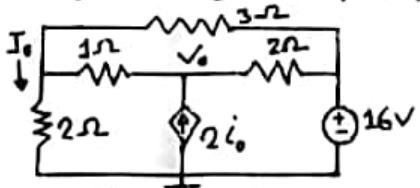


(c) What are the conditions of short circuit and open circuit? Determine the number of branches and nodes of the following figure: 1 5

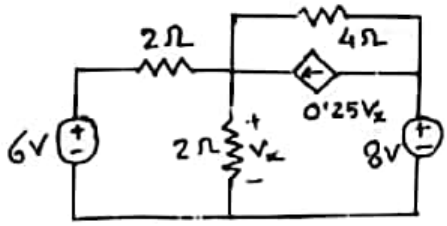


Q3 (a) What is planar and non-planar circuit? How non-planar circuits can be handled? 3

(b) Find V_0 and I_0 in the following circuit using mesh analysis. 2 4

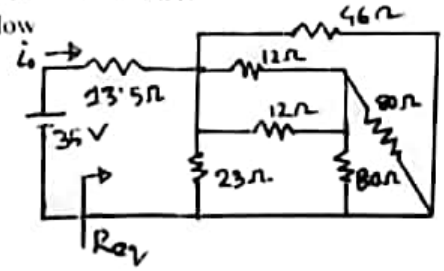


(c) State superposition theorem. Find V_x in the following figure using source transformation. 5 5



Q4 (a) Write short notes on KVL, KCL, VDR, and CDR 4

(b) Find R_{eq} and i_0 in the circuit below 4

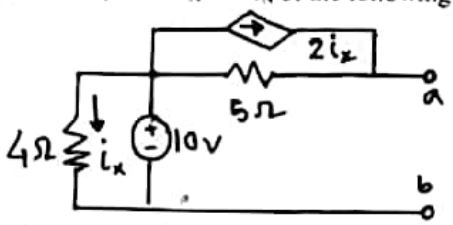


(c) Draw the connection diagrams of voltmeter, ammeter, and wattmeter in a circuit. Discuss the ohmmeter principle to estimate resistance. 4

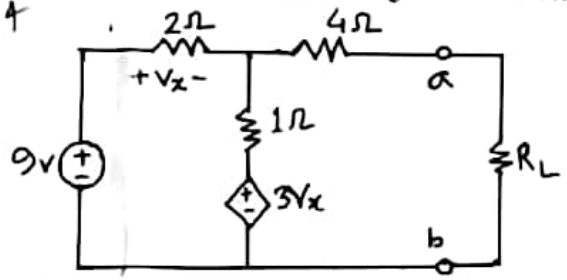
SECTION-B

Q5 (a) State maximum power transfer theorem. Prove that $P_{max}=V_{Th}^2/4R_{Th}$; where symbols have their usual meaning. 4

(b) Using Norton's theorem, Find R_N and I_N of the following circuit at terminals a-b. 4

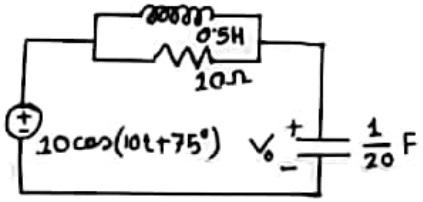


(c) Find the value of R_L for maximum power transfer in the circuit given below. Also calculate maximum power. 4

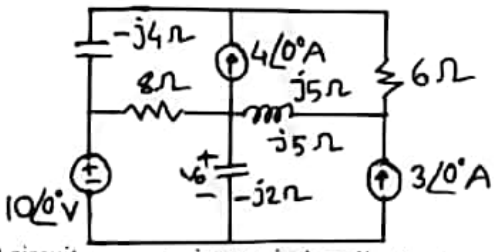


Q6. (a) What is phasor? Determine the voltage-current phasor relationship for circuit element L with phasor diagram. 4

(b) Calculate V_0 in the circuit given below. 3



(c) Solve for V_0 in the following circuit using mesh analysis. 5



Q7. (a) Why is resonant circuit necessary in practical applications? 1

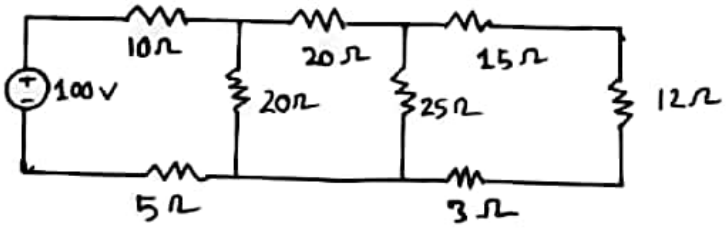
(b) Derive the expressions of resonant frequency, Quantity factor, and bandwidth for a series resonant circuit. 6

(c) A series RLC circuit has the values, R=10Ω, L=0.01H, C=100μF. Calculate resonant frequency, quality factor, bandwidth and half power frequencies. 5

Q8. (a) What is Fourier transform? What are the differences between Fourier Transform and Fourier Series? Determine the Fourier transform of one cycle of a sine wave, $f(t)=A \sin \omega_0 t$. 6

(b) What does the word 'PSpice' stand for? 1

(c) Write a PSpice program to analyze the following circuit. 5



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RAJSHAHI UNIVERSITY OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
1st Year Odd Semester Examination 2017

COURSE NO: Chem 1113 COURSE TITLE: Inorganic and Physical Chemistry

FULL MARKS: 72 TIME: 3 HRS

N.B. (i) Answer any SIX questions taking any THREE from each section.
(ii) Figures in the right margin indicate full marks.
(iii) Use separate answer script for each section.

SECTION : A

Q.1. (a) Explain the terms with two examples: (i) Heat of combustion (ii) Integral heat of solution and (iii) Standard heat of formation. 6

(b) Discuss the effect of temperature on heat of reaction. Heat of combustion of acetic acid is -869.0 KJ/mole. Calculate the heat of formation of acetic acid when heat of formation of $CO_{2(g)}$ and $H_2O(l)$ are -395.0 KJ/mole and -285.0 KJ/mole respectively. 6

Q.2. (a) What do you mean by chemical bond? Classify them with proper examples of each class. 5

(b) Why do the elements form chemical bond? Explain. 4

(c) Explain the mechanism of electrical and thermal conductivity of metal. 3

Q.3. (a) What are colloids? Distinguish between lyophilic and Lyophobic colloids. 6

(b) What is electrophoresis? How does this phenomenon provide information about the sign of charge on colloidal particles? 4

(c) Explain Gold number. 2

Q.4. (a) Explain the laws of Thermo- chemistry. 5

(b) Write short note on Hydrogen bond formation. 4

(c) State and explain Roult's law of lowering of vapour pressure. 3

SECTION : B

Q.5. (a) State and explain the laws of osmotic pressure. How molecular mass of a solute is determined from osmotic pressure. 7

(b) What is molal depression constant? A solution containing 7.5 gm of Urea in one kg of water freezes at the same temperature as another solution containing 15 gm of solutes in same amount of water. Calculate the molecular mass of S. 5

Q.6. (a) State and example Le-chaterlier-Bracem principle of mobile equilibrium. Discuss briefly the various factors which influence the equilibrium constant of a reaction. 7

(b) Why chemical equilibrium is called a dynamic equilibrium? Derive a relation between *Kp* and *Kc* for the reaction: 5

$$2SO_{2(g)} + O_{2(g)} \Leftrightarrow 2SO_{3(g)}$$

Q.7. (a) Define chemical kinetics. What are the subjects of study of chemical kinetics. 4

(b) Define the rate of reaction, rate law, order and molecularity of reaction. 4

(c) In the hydrolysis of ethyl acetate using equal concentration of ethyl acetate and NAOH solutions, the following results were obtained - 4

Time (Min)	0	5	15	25	35
HCL (ml)	16.0	10.24	6.13	4.32	3.41

Show that the reaction is of second order.

Q.8. (a) Write the principle of acid-base titration. 4

(b) Write the names of the suitable indicators for the following case of acid-base titrations - 4

(i) strong acid and strong base
(ii) strong acid and weak base
(iii) weak acid and strong base
(iv) weak acid and weak base

(c) 12.0 ml of H_2SO_4 acid solution can neutralize 11.0 ml of NAOH base solution. If the normality of acid solution is 0.12N, what is the normality of the base solution? 4

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