Department of Computer Science & Engineering
University of Asia Pacific (UAP)

Final Examination **Spring 2016** **1st Year 1st Semester**

Course Code: CSE 101 **Course Title: Computer Fundamentals** **Credits: 3**

Full Marks: 150 **Duration: 3 Hours**

Instructions:

1. There are **Eight (8)** Questions. Answer any **Six (6)**. All questions are of equal value. Part marks are shown in the margins.
2. Non-programmable calculators are allowed.

1. a) Write a code which will input a number from the user and find out that, this number contains any odd digit or not(1,3,5,7,9 are odd digits). If the number contains any odd digit, it will print "YES" else it will print "NO". 10

Sample Input	Sample Output
25420	YES
2660	NO
51	YES

b) Write down sample input and output for the following code:

```
#include <stdio.h>
#include<string.h>
int main()
{
   char s[1000],i,len=0;
   gets(s);
   for(i=0; s[i]!='\0'; i++)
         {
                len++;
         }
   printf("%d",len);
   return 0;
}
```

10 | 1234 | 123
1230
04

5

c) Write down different kinds of basic structures of a user defined function.

2. a) Write a code which will take two values as input and find out all the numbers who are not prime numbers within that interval. 12

Sample input: 2 10

Sample output: 4,6,8,9,10

b) convert the following while loop into for loop: 7

```
void #include <stdio.h>
     main()
     {
       int i = 10;

       while ( i > 0 )
       {
         printf("Hello %d\n", i );
         i = i -1;
         if( i == 6 )
         {
           break;
         }
       }
     }
```

c) Write down any three header files and write two library functions for each of them. 6

3. a) Write down the differences between library function and user defined function. 6

b) Write a code that will take an input n from user and will draw the following pattern. 13

Sample Input	Sample Output
4	**** *** ** *

c) What will be the output for following program? 6

```
#include<stdio.h>
int main()
{
  int a[5] = {3, 6, 9, 12, 0};
  int i, j, m;
  i = a[4]++;
  j = a[i]--;
  m = a[++i]--;
  printf("%d, %d, %d", i, j, m);
  return 0;
}
```

4. a) What will be the output for the following code: 6

```
#include<stdio.h>
#include<string.h>
int main()
{
  char s1[100], s2 [100];
  int i;
```

```
 strcpy(s2, strcpy(s2, "JOHN SNOW"));
 strcpy(s1, "YOU KNOW ");//there is a space after KNOW
 for (i=0; i<2; i++)
 {
    strcat(s1, "NOTHING ");   //there is a space after NOTHING
 }
 printf("%d\n", strlen(s1));  25
 printf("%d\n", strlen(s2));  9
 printf("%s\n", s1);
 printf("%s", s2);
 return 0;
}
```

b) What is a recursive function? Describe with an example. 6

c) Write a code to display only the sum of all odd factors of a number. 13

Sample Input	Sample Output
10	6
15	9

5. a) What will be the output of the following program: 6

```
#include<stdio.h>
int main()
{
   int a = 5;
   int b = a++;
  printf("%d, %d, %d\n", a++,b, b++);
   return 0;
}
```

6 6 5

b) What is string? Write down differences between array and string. 6

c) Write down a code to count the number of vowel characters in an input string. 13

Input :

U CAN'T C ME.

Output :

3

6. a) Write down the difference between *while loop* and *do while loop*. Explain with example. 5

b) What are the errors of the following code? 6

```
#include<stdio.h>
int hola(int m);
```

char a[100], ch,
printf ("Enter a sen

```
int main()
{
        int n = 10, c=18, d[ 3]={1,4,5,2};
        while(c%2==0){
                n=*2;
                hola(n);
                c--;
        }
}
int hola(int m)
{
        return m*m;
}
```

c) Company XYZ have been badly hit by loss and is taking a lot of cost cutting measures. Some of these measures include giving up office space, going open source, reducing incentives, cutting on luxuries and issuing pink slips. They have got three employees working in the accounts department and are going to dismiss two of them. After a series of meetings, they have decided to dismiss the person who gets the most salary and the one who gets the least. This is usually the general trend during crisis like this. You will be given the salaries of these 3 employees working in the accounts department. You have to find out the salary of the person who survives. 14

Sample Input

1000 2000 3000

3000 2500 1500

1500 1200 1800

Sample Output

2000

2500

1500

7. a) Write down any four string function with example. 8

b) Write a c program to convert all the upper case letters to lower case and lower case letters to upper case in an input string . 9

Sample Input	Sample Output
BAnglaDesh	baNGLAdESH
RisulNahin	rISULnAHIN

c) What will be the output for the following code? 8

```
#include <stdio.h>
int main()
{
        int a[12]={4,5,6,7,4,2,89,51},i,h=8;
        int sum = 0;
        for(i = 1; i <= h; i++)
        {
                if(a[i] % 3==0)
                {
                        sum+=i;
                }
        }
        printf("%d %d\n",i,sum);
        return 0;
}
```

8. a) What will be the output for the following code? 7

```
#include<stdio.h>
int subway(int ii, int jj);
int main()
{
  int a;
  int i= 3, j=6,k,o;
  for(a=0; a<3; a++)
  {
    k = subway(i, j);
    o=subway(k,j);
  }
  printf("%d %d", k,o);
  return 0;
}
int subway(int ii, int jj)
{
  int p=3;
  int kk, dd;
  kk = ii - p;
  dd = kk + jj;
  return (dd);
}
```

b) Write a recursive function to find out the factorial of a number. User will provide the number.

Sample Input	Sample Output
4	24
5	120

c) Write down if the necessary statements are true or false. Explain every answer: 10

I. An array can contain multiple types of data simultaneously.

II. Char str[4]="BOSS";

This is a valid statement.

III. double p[3][7];

This 2D array's memory size is 168 bits. (Double = 7 bytes)

IV. The size of Double mentioned question III. is incorrect.

V. int r[10]={0}

in this array only the first element value is 0.

University of Asia Pacific

Department of Basic Sciences and Humanities

Final Examination, Spring 2016

Programme: B. Sc. Engineering (Computer Science)

(1st Year 1st Semester)

Course Title: Bangladesh Studies: Society and Culture **Course Code: HSS 111(a)**

Credit: 2.00

Time: 2 Hours **Full Marks: 100**

There are **SIX** questions. Answer **ANY FOUR** (4x25)

1. Define Social Stratification. Explain the four systems of Social Stratification. 5+20

2. Distinguish between Karl Marx and Max Weber in their explanation of social class. 25

3. Elaborate the characteristics of Capitalism and Socialism. What are the advantages of Capitalism and Socialism? 10+15

4. Define authority. Explain the three types of authority according to Max Weber. 5+20

5. What do you understand by global cities? What are the challenges of urbanization in the developing world? 10+15

6. Draw a comparison among digital, social and global divide. 25

Boreaugova.

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University of Asia Pacific

Department of Basic Sciences and Humanities
Semester Final Examination, Spring 2016
Program: B.Sc. Engineering (Computer Science)
1st year 1st semester

Course Title: Bangladesh Studies: History Course Code: HSS 111(b) Credit: 2.00

Total Time: 2 Hours Full Marks: 100

Answer any **Four.** All questions are of equal value (4 x 25)

1. What were the causes that led to the Sepoy Mutiny of 1857? How did this event impact the history of colonial India?
2. Discuss the main theme of the Lahore Resolution of 1940. How the resolution affected the later history of India, and especially that of Bengal?
3. Analyze the significance of the Language Movement of 1952. Describe how this movement sparked the sense of nationalism among us.
4. What was the Six Point Program? How did it accelerate the demand for greater autonomy for the then East Pakistan?
5. Give an account of the Liberation War of Bangladesh with special emphasis on important phases.
6. Write short notes on (any two):
   a. Ishwar Chandra Bidhyasagar
   b. Bengal Renaissance
   c. Partition of Bengal (1905-1911)
   d. Jugto Front and Election of 1954

University of Asia Pacific

Department of Computer Science & Engineering

Program: BSc. Engineering

Semester Final Examination (Spring 2016)

Year: 1st Semester: 1st

Course Code: HSS 101 Course Title: English Language I

Full Marks: 50 Time: 3.00 Hours

*Marks are indicated in the right margin.

Section – A

1. Read the passage carefully and then answer the corresponding questions. 5 x 1 = 5

Bathtubs have a very curious history. The bathtub has been in existence for thousands of years. The modern day bathtub is very different from its ***predecessors***. The bathtub originated in ancient Rome as a social gathering place. The Romans are famous for being one of the first civilizations to bathe. Starting in around 500 BC, Roman citizens were encouraged to bathe daily in one of the many public bathtubs. The Romans used the public baths as a place for social events and as a chance to get to know other people. Their public baths were fairly large and most commonly made of marble. The Romans used lead or bronze pipes to fill the tubs with water.

In 1883, the Standard Sanitary Manufacturing Company and the Kohler Company began producing cast-iron tubs. These companies advertised their tubs as horse troughs — large tubs where horses could drink – because this was seen as a more marketable product than a bathtub. However, human bathing in the tubs became popular due to the easy to clean surface of the tub, and the desire to prevent disease.

One cannot explain the history of bathtubs without mentioning the name Henry L. Mencken. He was a journalist who ***infamously*** wrote a false story ***regarding*** the history of bathtubs. In his story, Mencken wrote that the first bathtub in the United States belonged to Adam Thompson. According to the story, Adam Thompson put a bathtub in his house in 1842. At a Christmas party, four guests tried the tub, and news of the bathtub was in the newspaper the next day. Mencken went on to claim that some people were upset about the news of Thompson's bathtub because they believed it to be undemocratic. In addition to these, he ***fabricated*** several other details. He wrote that several cities put very high taxes on water for houses that had bathtubs.

Eight years after he wrote the false story, Mencken wrote a second story admitting that everything he had written about bathtubs was false. His story on the bathtub is now considered to be one of the most famous newspaper tricks, in history.

Finally, after World War I – and after Mencken's hoax – many new houses were built in the United States with indoor plumbing. Previously, most houses in the United States did not have indoor plumbing. In the early 1920s, only 21% of houses had bathrooms, but by the end of the twentieth century, all new houses had bathrooms.

Today, there are many different types of bathtubs. Luxury bathtubs are made not only for bathing, but also for recreation and relaxation. Some homes have hot–tubs, which are also called **spas**. The hot tub has a built in heater that keeps the water hot and jets to create bubbles. Some hot tubs even have built–in sound systems so the bather can listen to music while they relax. It is clear that, throughout its long history, the bathtub has changed ***tremendously*** since its birth in ancient Rome.

a) If something is infamous, it is …
   i. audacious
   ii. notorious
   iii. laudatory
   iv. praiseworthy

b) What were the Roman baths made of?
   i. Iron
   ii. Glass
   iii. Marble
   iv. Bronze

c) When did American's start building bathrooms in their houses?
   i. After World war I
   ii. During World war I
   iii. In the late 1800s
   iv. None of the above

d) According to the passage 'Spa' means –

i. Place to take shower in mineral water
ii. Place to take bath in steam water
iii. Place to take bath in cold water
iv. None of the above

e) Mencken's story was fabricated. It means –

i. It was intricate
ii. It was fictitious
iii. It was genuine
iv. It was popular

Section – B

2. Fill in the blanks with appropriate parts of speech. 6 x 1 = 6

a. We should not get _____ about our everyday problems. (Pessimist)
b. People now-a-days do not _____ on their tasks, they are always in a hurry. (reflection)
c. The BCB can use the _____from the Australian Cricket Board regarding bouncing pitch. (expert)
d. There are not much _____ articles regarding higher studies abroad. (Information)
e. *Despicable Me* was an _____ movie of 2010. (entertainment)
f. The authority didn't _____ whether they will go with the flow or take a new direction. (specific)

3. Add either prefix or suffix with any four (4) of the following words and make a sentence with each of the new words. There are more words (and prefix/ suffix) than is required. 4 x 1 = 4

dis-, en-, im-, mis-, post-, -ity,

balance, calculation, danger, appoint, mortem

4. Make separate sentences from any Four (04) homophone pairs that are given below 4 x 2 = 8

a. break, brake
b. cue, queue
c. site, cite
d. ceiling, sealing
e. toad, towed
f. wait, weight

5. The following excerpt has some misspelled words, tense and misused capitalization. Trace them out and write the passage correctly. 6

There is a few standard rules that every student should observe at all times when it come to behavior in the classroom. You are sharing your classroom with several other people who are just as importent as you. Don't try to make others feel embarassed. Don't make fun of others, or roll your eyes, or made faces when they are speaking. If you must sneez or cough, don't do it on another student. Turn off and use a tissue. Say "Excuse me." dehydration can cause sleepiness. Make sure you drink water throughout the day. While the teacher is talking, look at the teacher to make eye contact unless you're writing notes, don't whispar. If someone is brave enough to ask a question, don't laugh or make fun of them. Messy work spaces can become distractions. try to clean your own space often, so your clutter don't interfere with the classroom work flow. Arriving late to class is bad for you and it is bad for other students. When you walk in late, you interrapt the work that has begun. Learn to be punctual!

Section – C

6. Suppose you are invited to attend an IELTS workshop on 1 October 2016 organized by the British Council at Fuller Road, Dhaka. Now write an **inquiry letter** to the Director requesting information for the necessary educational qualifications and registration procedure to attend the workshop. 8

7. Write a movie review on any English or Bangla movie you have watched recently. 5

8. Write a paragraph on any one (1) from below (minimum 250 words) 8

a) Five things you cannot live without
b) Your expectation from life & reality

University of Asia Pacific
Department of Basic Sciences & Humanities
Semester Final Examination, Spring 2016
Program: B. Sc Engineering (Computer Science)
1st Year/ 1st Semester

Course Title: Mathematics I
Time: 3.00 Hours

Course No. MTH 101
Full Mark: 150

Answer any **Six** of the followings

6×25= 150

1. (a) Define dot and cross products of two vectors $\vec{A}$ and $\vec{B}$. **5**

(b) If $\vec{A} = 2\hat{\imath} - 3\hat{\jmath} - \hat{k}$, $\vec{B} = \hat{\imath} + 4\hat{\jmath} - 2\hat{k}$, $\vec{C} = \hat{\imath} - 2\hat{\jmath} + 2\hat{k}$, then find

i. $(\vec{A} + \vec{B}) \times (\vec{A} - \vec{B})$

ii. $(\vec{A} \times \vec{B}) \times \vec{C}$ **6**

iii. $(\vec{A} \cdot \vec{B})\vec{C}$

(c) If $\vec{A} = A_1\hat{\imath} + A_2\hat{\jmath} + A_3\hat{k}$, $\vec{B} = B_1\hat{\imath} + B_2\hat{\jmath} + B_3\hat{k}$, $\vec{C} = C_1\hat{\imath} + C_2\hat{\jmath} + C_3\hat{k}$, then prove that,

$$\vec{A} \cdot (\vec{B} \times \vec{C}) = \vec{B} \cdot (\vec{C} \times \vec{A}) = \vec{C} \cdot (\vec{A} \times \vec{B})$$ **14**

2. (a) Define Continuity of a function. A function $f(x)$ is defined by

$$f(x) = \begin{cases} 3 + 2x, & -\frac{3}{2} \le x < 0 \\ 3 - 2x, & 0 \le x < \frac{3}{2} \\ -3 - 2x, & x \ge \frac{3}{2} \end{cases}$$ **10**

Show that $f(x)$ is discontinuous at $x = 3/2$.

(b) Examine the differentiability of $f(x)$ at $x = 1$. Where

$$f(x) = \begin{cases} x^2 + 1, & x \le 1 \\ 2x, & x > 1 \end{cases}$$ **10**

(c) Expand the function $\ln(\sin(x + h))$ in power of h by Taylor's theorem. **5**

3. (a) Evaluate:

(i) $\int \frac{a\cot x + b\tan^2 x - c\sin^2 x}{\sin x} dx$ (ii) $\int x^2\sqrt{x+1}\, dx$ (iii) $\int \frac{1}{(1+x^2)(\tan^{-1} x)^2} dx$ **12**

(b) Integrate: $\int_0^1 (\sin^{-1} x)^2\, dx$. **13**

4. (a) Integrate the following with respect to x using integration by parts $\int e^{px} \cos qx\, dx$. **13**

(b) Evaluate $\int \frac{x}{(x-1)(x^2+4)} dx$, using method of breaking up into partial fractions. **12**

5. (a) Define direction cosines and direction ratios of a line. 6

(b) Show that the lines whose direction cosines are proportional to

$$2, 1, 1 \; ; \; 4, \sqrt{3}-1, -\sqrt{3}-1 \; ; \; 4, -\sqrt{3}-1, \sqrt{3}-1$$ 14

are inclined to one another at angle $\frac{\pi}{3}$.

(c) If $A(8,-1,-6)$, $B(1,-2,0)$, $C(5,1,-2)$ and $D(4,-4,-4)$ are four points respectively then show that $AB \perp CD$. 5

6. (a) Find the equation of the plane through the point $(4, 0, 1)$ and parallel to the plane $4x + 3y - 12z + 6 = 0$. 5

(b) Show that the equation of the plane through the point $(1, 1, 2)$ and perpendicular to each of the planes $x - y - 2z - 3 = 0$ and $3x + y + 6z - 4 = 0$ is $x + 3y - z - 2 = 0$. 10

(c) Find the equation of the straight line that intersect the lines $4x + y - 10 = 0 = y + 2z + 6$ and $3x - 4y + 5z + 5 = 0 = x + 2y - 4z + 7$ and passing through the point $(-1, 2, 2)$. 10

7. (a) Find **(a)** all the minors of A **(b)** all the cofactors of A

(c) $\text{adj}(A)$ **(d)** A^{-1} using its adjoint. Where, $A = \begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{pmatrix}$. 12

(b) Find the conditions on λ and μ such that the following system of linear equations will have **(i)** a unique solution, **(ii)** no solution and **(iii)** more than one solution.

$$x + y + z = 6$$
$$x + 2y + 3z = 10$$
$$x + 2y + \lambda z = \mu$$ 13

8. (a) What do you mean by linear combination of vectors. Show that the vector $\vec{v} = (5, 9, 5)$ can be express as a linear combination of the vectors $\vec{v_1} = (2, 1, 4)$, $\vec{v_2} = (1, -1, 3)$ and $\vec{v_3} = (3, 2, 5)$. 15

(b) Show that the vectors $\vec{v_1} = (1, -2, 3)$, $\vec{v_2} = (5, 6, -1)$ and $\vec{v_3} = (3, 2, 1)$ are linearly dependent. 10

University of Asia Pacific

Department of Basic Sciences and Humanities

Semester Final Examination, Spring- 2016

Program: B. Sc Engineering (CSE, 1st year/1st semester)

Course Title: Physics I | Course No. PHY-101 | Credit: 3.00

Time: 3.00 Hours | Full Mark: 150

[There are **Eight** questions. Answer any **Six**. The figures in the right margin indicate marks.]

1. a) What are the differences between heat and temperature? Mention different scales of temperature and the relationship between them. Find a temperature which gives the same reading both in the Celsius and Fahrenheit scale. 15

   b) What are the modes of heat transmission? Define latent heat and explain thermal conductivity. State and explain Newton's law of cooling. 10

2. a) Define thermal capacity and specific heat at constant pressure, C_P, and specific heat at constant volume, C_V. Prove the relationship: $C_P - C_V = R$, where all the quantities are expressed in ergs, and the symbols have their usual meanings. 15

   b) Calculate C_P for air. Given that $C_V = 0.1618$ cal.gm^{-1}.°C^{-1}, density of air at 27 °C and at standard pressure is 1.18 gm.lit^{-1}, and water equivalent of heat is 4.2×10^7 erg.cal^{-1}. 10

3. a) Derive the expression, $P = \frac{1}{3}mnC^2$, where the symbols have their usual meanings. 20

   b) Define root mean square velocity. 05

4. a) State second law of thermodynamics. Derive the expression for efficiency of a Carnot heat engine. 21

   b) Find the efficiency of a heat engine working between temperatures 70 °C and 27 °C. 04

5. a) What do you mean by damped vibration? Deduce the general equation of motion for damped vibration. 10

   b) Solve the general equation of motion for damped vibration to obtain a general solution for displacement of an object undergoing damped vibration. 15

6. a) Define forced vibration. Write down the name of the forces acting on an object undergoing forced vibration. 08

   b) What do you mean by resonance? Derive expressions for resonance frequency and resonant amplitude. 17

7. a) Distinguish between free, damped, and forced vibration. 05

b) What do you mean by Lissajous figure? If two simple harmonic wave combines at right angles with each other than show the necessary conditions on which the different Lissajous figures are obtained. (Please provide your answer with detailed mathematical proof and diagrams). 20

8. a) Define the term interference of light. Write down the conditions necessary to obtain interference pattern. 07

b) Briefly discuss experimental set up for the Young's double slit experiment. Hence deduce expression for obtaining maximum and minimum intensity of light in Young's double slit experiment. 18

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