**Shahjalal University of Science & Technology, Sylhet**
**Department of Biochemistry and Molecular Biology**
B. Sc. (Hons) 2nd Year 1st Semester Final Examination, 2014
Course No. : **BMB -221** Course Title: Enzymology-I
Credit: **2.0** Total marks: **70** Time: **2** hours

*Instructions:*

- *Number in the right side indicates the marks of the question.*
- *Marks for each question are same.*
- *Answer any two (2) questions from each Part (A and B).*

**Part –A**

1. a) Define the following terms (any three); 4.5
   i) Allosteric site ii) Holoenzyme
   iii) Katal iv) Enzyme activity
   b) What is enzyme assay? Discuss thetwo ways of discontinous enzymatic assay. 4.5
   c) Write short notes on; 5.0
   i) Oxidorductases enzyme and ii) Hydrolases
   d) Discuss the factors affect in the enzyme assay. 3.5

2. a) Enzyme affect reaction rate, not equilibrium; justify the statement. 4.0
   b) "Enzyme use binding energy to lower the activation energy for a reaction" explains the above statement. 4.5
   c) Outline the Lock & Key model for an enzymatic action. 5.0
   d) Write down the differences between enzyme and chemical catalyst. 4.0

3. a) Describe the sequential mechanism for an enzymatic reaction. 3.5
   b) "Mutarotation of glucose involves the acid-base catalysis" justify the given statement. 4.5
   c) Briefly describe the effect of coenzyme and cofactor on enzymatic reaction. 6.0
   d) Briefly explain the specific activity of enzyme. 3.5

**Part-B**

4. a) Deduce the Michaelis-Menten equation for the single substrate enzymatic reaction. 6.5
   b) Discuss the biochemical basis of sensitivity of Asians to alcoholic beverages. 3.0
   c) Explain the thermal lability of G6PD results in homolytic anemia. 3.0
   d) What are the requirements of a valid enzyme assay? Discuss how couples assays utilize the optical properties of NAD, NADP or FAD? 5.0

5. a) Describe the competitive inhibition, uncompetitive inhibition and mixed inhibition by appropriate figure. 4.5
   b) "Sulfa drugs act as a antibacterial agent through reversible inhibition against PABA" explain the statement with giving the route of folate synthesis in bacteria. 5.0
   c) Why allosteric enzyme diverges from Michaelis-Menten behavior, explain with the effect homotropic and heterotropic interaction? 5.5
   d) Discuss the function of antimetabolite in cancer treatment. 2.5

6. a) Write down the names of three clinically important enzymes with their principle source and clinical application. 4.5
   b) Outline the ELISA system schematically for detecting the AIDS virus envelope proteins. 5.0
   c) Discuss the clinical significance of; 6.0
      i) α-amylase
      ii) acid phosphatase
      iii) lactate dehydrogenase
   d) What does increases activity of AST in plasma. 4.0

```
8.          for(c=0;c<a;c++){
9.                  for(d=0;d<b;d++) {
10.                 printf("%d\n",c+d);
11.                 if (d%3==0) {
12.                   printf("Good luck\n");
13.                   break; }
14.                 }
15.         }
16.   }
```

i. If there is any error in the above program then write the line number and correct the code for that line. 2

ii. For a=10 and b=5, how many times the line *Good Luck* will execute? 1.5

c) What are the criteria for a function to be recursive? 1.5

## GROUP-B

a) What is a function? State three advantages to the use of it. 2.5

b) Write the output generated by the following program. 2

```
#include<stdio.h>
float function1(float a);
int main(){
    float x,i;
    for(i=1;i<=10;i=i+2) {
        x=function1(i);
        printf("%f\n",x); }
    return 0;
}
```

```
float function1(float a) {
    float b;
    b=a*a;
    return b;
}
```

c) Each of the following is the first line of a function definition. Explain the meaning of each. 4

i. double f (double a, int b)
ii. void f (int a)
iii. long f (long a)
iv. float f (float a, float b)

d) What are the differences between global and local variables? 2

e) Distinguish between x++ and ++x with example. 2

a) Write the output of the following code segments: 3

(i)

```
#include<stdio.h>
void main(){
    int i, a[10]={0,1,2,3,4,5,6,7,8,9};
    for(i=0;i<10;i++)
        a[i] += 9-i;
    for(i=0;i<10;i++)
        printf("%d\n",a[i]);
}
```

(ii)

```
#include<stdio.h>
int c[10]={11,2,3,4,5,6,7,8,9,0};
main(){
  int a,b=0;
  for(a=0;a<10;++a)
     if ((c[a]%2)==1) b+=c[a];
     printf("%d",b);
}
```

b) What will be the output of the following program? 3

```
int f(int n, float p);
main() {
  int x;
  x = f(5, 2.0);
  printf("%d", x);
}
```

```
int f(int x, float y) {
  if(x>y) return x;
else return y;
}
```

c) What are the benefits of pointers over the use of arrays? What is the output generated by the following program? 2.5

```
#include<stdio.h>
int main(){
    int x=10, y;
    int *px, *py;
    px=&x;
    y=*px+20;
    py=&y;
    printf("%d  %d\n",y,*px);
    printf("%d  %d\n",x,*py);
    return 0;
}
```

d) Define a structure *student* with Name and Roll. 2

a) What is the syntactical difference between for and while loop? 1

b) Convert the following while loop to do-while loop and write the output generated by the following program. 5.5

```
void main() {
   int i=1, j=5;
   while(i<=5 && j>=0) {
      printf("It is a test\n");
      i++; j--; } // question 6(b)
}
```

```
**
***
****
***
**    // question 6(c)
```

c) Write a C program that prints the following outputs using any nested loop structure. 4

i) α-amylase
ii) acid phosphatase
iii) lactate dehydrogenase

d) What does increases activity of AST in plasma. 4.0