Sample Midterm Exam Questions with Solutions

Q.2. (15 points) Design an algorithm **OR** draw a flowchart for a computer program that finds the average of **3 input numbers** entered by the user and prints "pass", if average is greater than or equal to 50, otherwise prints "fail". At the end it must print computed average as well.

- 1. BEGIN
- 2. PRINT "Enter three numbers:"
- 3. READ num1, num2, num3
- 4. average = (num1+num2+num3)/3
- 5. IF average >= 50
 PRINT "pass"
 ELSE
 PRINT "fail"
 - ENDIF
- 6. PRINT "average:", average
- 7. END

Q.3. (19 points)

a) (10 points) State which of the following C identifier names are valid or invalid. Give reason if invalid.

Identifier Name	Valid or Invalid	Reason(s) if invalid
Return	valid	
_C	valid	
a.b	invalid	No special character
2B	invalid	Cannot start with a number
Midterm Grade	invalid	No space between the words

b) (9 points) Write down a C expression corresponding to each of the following mathematical expressions.

Mathematical Expression

C Expression

a) $\frac{t}{k} - \frac{\frac{t}{k} + 2}{3s^2}$	t/k-(t/k+2)/(3*s*s)
b) $2a\frac{2c}{a+b}$	2*a*((2*c) / (a+b))
$c) \frac{-b + (b^2 - 4ac)}{2a}$	(-b+(b*b-4*a*c))/(2*a)

Q.4. (20 points)

a) (10 points) Compute the values of the following C expressions assuming that a, b and c are integer variables and d is a float variable as declared below.

int a=2, b=3, c=4;

float d=5.0;

- i) (b+2)/b+2
- ____3___

ii) b*c/d

____2.4____

- iii) a/(b/c-1)
- ____-2___
- iv) b%c*(a/d)
- ____1.2___

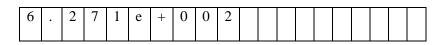
- v) ++a+b--
- _____6___

b) (10 points) For the following statements, give the corresponding outputs into the boxes on the right which correspond to different spaces in the output.

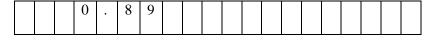
i) printf("%-4d%3d", 2, 4);

2					4												
1	1	ı	ı	ı	1	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı	ı

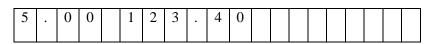
ii) printf("%10.3e", 627.14);



iii) printf("%7.2f", 0.888);



iv) printf("%-5.2f %.2f", 5.0, 123.4);



v) printf("%f%c%d", 23.12, '+', 15);

Q.5. (20 points)

In the following C program there are total of **10 errors** in different lines. In the provided table, indicate the line numbers which error occurred and write your correction in front:

```
1: #include (stdio.h)
 2: #Define PI 3.14
 3: int main
 4:{
 5: Int rad, base, height;
 6:
    Float area, ci;
 7:
 8:
    printf("\nEnter radius of circle: ");
 9:
    scanf("%d", rad);
10:
11:
     area = PI * rad * rad;
12:
     printf("\nArea of circle : %d ", area);
13:
14:
     ci = 2 * PI * rad;
15:
     printf("\nCircumference : %f ", ci)
16:
17:
     printf("\nEnter the base of Right Angle Triangle : ");
18:
     scanf("%d", &base);
19:
20:
     printf("\nEnter the height of Right Angle Triangle : ");
21:
     scanf("%d", &height);
22:
23:
     area = 0.5 * base * height;
24:
     printf("\nArea of Right Angle Triangle : %f", area);
25:
     Return 0;
26:
```

Line	Correction			
number				
1	#include <stdio.h></stdio.h>			
2	#define PI 3.14			
3	int main()			
5	int rad, base, height;			
6	float area, ci;			
9	scanf("%d", &rad);			
12	<pre>printf("\nArea of circle : %f ", area);</pre>			
15	<pre>printf("\nCircumference : %f ", ci);</pre>			
25	return 0;			
26	}			

Q.6. (17 points) The formula for the volume of a sphere is $V = \frac{4}{3} \pi a^2 b$ where a and b are the half-lengths of the major and minor axes respectively. The following C program reads values for a and b and then calculates and displays the volume. Complete the missing parts in the program. Use appropriate variable declarations in the program (do not use any additional variables) and write only 1 statement on each blank line.

#include <stdio.h>

/*declare the constant value of \$\pi\$ as 3.141593

____#define PI 3.141593_____

int main()
{

/* declare variables */

___float a, b, V;_____

/*read the values of a and b from the keyboard*/

___scanf("%f%f", &a, &b);____

/*compute the volume of the sphere */

___V=4.0/3*PI*a*a*b;-____

/*display the result onto the screen*/

___printf("Volume = %f", V); ___

return 0;
}