Let us C
(by yashvant Kanetkar) chapter 1
Solution

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A. Which of the following are invalid variables name and why?

1) BASICSALARY
   - It is a valid variable.
2) _basic
   - It is a valid variable.
3) basic-hra
   - Hypen is not valid between two words.
4) #MEAN
   - # is invalid in the name of variable.
5) group.
   - Full stop is not applicable in the name of variable. 6) 422
   - Variable name is the combination of letters and digits, not only digits.
7) population in 2006
   - There is the gap between the words ,there should not be any gap.
8) over time
   - Mistake of a gap
9) mindovermatter
   - It is a valid variable
10) FLOAT
    - Valid variable
11) hELLO
    - It is a valid variable
12) queue.
    - Mistake of a full stop
13) team'svictory
    - ➢ ' is not applicable in the name of variable.
14) Plot # 3
    - Mistake of a gap.
15) 2015_DDay
    - Variable starts with digit is not aplicabble.

B. Point out the errors,if any, in the following C statement:

a) Int=314.562*150;
   - Int is a variable name of integer but the value of integer is not integer ,its basically float.
b) name=`Ajay';
   - Name is a character variable so in between there should only one letter or digit or special symbol, and inverted comma is not like that.
c) Varchar=`3';

- Mistake of inverted comma.

d) 3.14*r*r*h=vol_of_cyl;
- Variable name must be on left side.

e) k=(a*b)(c+(2.5a+b)(d+e);
- k-(a*b)*(c*+(2.5*a+b)*(d+e);

f) m_inst=rate of interest*amount in rs;
- Wrong because of gap between variable name.

g) si=principal*rateofinterset*numberofyears/100;
- Proper format is: (principal*rateofinterest*numberofyears)/100;

h) area=3.14*r**2;
- There is no meaning of** in C .

i) volume=3.14*r^2*h;
- There is no meaning of r^2 in C.

j) k=((a*b)+c)(2.5*a+b);
- K=(a*b)+c)*(2.5*a+b);

k) a=b=3=4;
- Proper format :(a=3 or a=4)or (b=3 or b=4).

l) count=count+1;
- Valid.

m) date=’2 mar 04’;
- Space between variable is not variable and character is of only one letter,digit or special symbol.

C. Evaluate the following expressions and show their hierarchy.

a) g=big/2+big*4/big-big+abc/3;
(abc=2.5,big=2,assume g to be a float)
- g=2/2+2*4/2-2+2.5/3;
  g=1+2*4/2-2+0.8
  g=1+4-2+0.8
  g=3.8

b) on=ink*act/2+3/2*act+2+tig;
(ink=4,act=1,tig=3.2,assume on to be an int)
- on=4*1/2+3/2*1+2+3.2;
  on=2+1.5+2+3.2
  on=8.7 (but on integer variable its value will be 8)

c) s=qui*add/4-6/2+2/3*6/god;
(qui=4,add=2,god=2,assume s to be an int

- s=4*2/4-6/2+2/3*6/3;
  s=8/4-6/2+0.6*3
  s=2-3+0
  s=-1

d) S=1/3*a/4-6/2+2/3*6/g;
  (a=4,g=3,assume s to be an int)

- S=1/3*4/4-6/2+2/3*6/2;
  S=0*4/4-3+0*6/3;
  S=-3

D. Fill the following table for the expressions given below and then evaluate the result.A sample entry has been filled in the table for expression(a).

operator	left	right	remark
/	10	5 or 5/2/1	Left operand is unambigous, right is not
..	..	..	..

a) g=10/5/2/1;

➢ =2/2/1
  =1/1
  =1

b) b=3/2+5*4/3;

➢ =1+20/3
  =1+6
  =7

c) a=b=c=3+4;

- a=b=c=7

E. Convert the following equations into corresponding C statements.

a) Z=8.8(a+b)2/c-0.5+2a/(q+r)
(a+b)*(1/m)
= 8.8*(a+b)*2/c-0.5+2*/(q+r)/((a+B)*(1/m)).

b) X= $\frac{-b+(b*b)+2\ 4ac}{2a}$
=(-b+(b*b)+2*4*a*c)/2*a.

c) R= $\frac{2v+6.22(c+d)}{g+v}$
=(2*v+6.22*(c+d))/g+v.

d) A= $\frac{7.7b(xy+a)/c-0.8+2b}{(x+a)(1/y)}$
=(7.7*b*(x*y+a)/c-0.8+2*b)/((x+a)*(1/y)).

F. What would be the output of following programs?

a)
```
main()
{
int i=2, j=3, k, l;
float a, b;
k=i/j*j;
l=j/i*i;
a=i/j*j;
b=j/i*i;
printf(“%d %d %f %f”, k, l, a, b);
}
```

Output:
0
2
0.000
2.000

b)
```
main()
{
inta, b;
```

```
a=-3- -3;
b=-3- -(-3);
printf(“a=%d b=%d”,a,b);
}
```

Output:
Error.

c) main()
```
{
int a=5,b=2;
int c;
c=a%b;
printf(“%d”,c);
}
```

Output:
1

d) main()
```
{
printf(“nn\n\n nn\n”);
printf(“nn/n/n nn/n”);
}
```
Output:
nn

nn

Nn /n/n nn/n

e) main()
```
{
```

```
int a,b;
printf(“enter values of a and b”);
scanf(“%d %d”,&a,&b);
printf(“a=%d b=%d”,a,b);
}
```

Output:

```
Enter values of a and b 34 23
a=34
b=23
```

f)

```
main()
{
int p,q
printf(“enter values of p and q”);
scanf(“%d%d”,p,q);
printf(“p=%d q=%d”,p,q)
```

Output:

```
Enter values of p and q 23 34
p=23 q=34
```

G. Pick up the correct alternative for each of the following questions:

a) C language has been developed by

1. Ken Thompson
2. Dennis Ritchie ✓
3. Peter Norton
4. Martin Ritchards

b) C can be use on

1. Only MS-DOS operating system
2. Only Linux operating system
3. Only windows operating system
4. All the above ✓

c) C programs are converted into machine language with the help of

1. An editor
2. A compiler ✓
3. An operating systmem
4. None of the above

d) The real constant in C can be expressed on which of the following forms

1. Fractional form only
2. Exponential form only
3. ASCII form only
4. Both fractional and exponential forms ✓

e) A character variable can at a time store

1. 1 character ✓
2. 8 characters
3. 254 characters
4. None of above

f) The statement char ch=’ Z’ would store in ch

1. The character Z ✓
2. ASCII value of Z
3. Z along with the single inverted commas
4. Both (1) ans (2)

g) Which of the following is not a character constant

1. ‘Thank You’
2. ‘Enter values of P,N,R
3. ‘23.56E-03’
4. All the above ✓

h) The maximum value that an integer constant can have is

1. -32767
2. 32767 ✓
3. 1.7014e+38
4. -1.7014e+38

i) A C variable cannot start with
1. An alphabet
2. A number
3. A special symbol other than underscore
4. Both (2)&(3) above √

j) Which of the following statement is wrong
1. mes=123.56;
2. con=’ T’ *’ A’ ;
3. this=’ T’ *20;
4. 3+a=b; √

k) Which of the following shows the correct hierarchy of arithmetic operators in C
1. **,*or/,+or-
2. **,*,/,+,-
3. **,/,*,+,-
4. /or*,-or+ √

l) In b=6.6/a+2*n;which operation will be performed first?
1. 6.6/a √
2. a+2
3. 2*n
4. Depends upon compiler

m) Which of the following is allowd in a C arithmetic instruction?
1. []
2. {}
3. () √
4. None of the above

n) Which of the following statement is false
1. Each new C instruction has to be written on separate line √
2. Usually all C statements are in small case letters
3. Blank spaces may be inserted between two words in a C statement
4. Blank spaces cannot be inserted within a variable name

o) If a is an integer variable, a=5/2; will return a value
1. 2.5
2. 3
3. 2
4. 0 √

p) The expression,a=7/22*(3.14+2)*3/5;evaluates to
1. 8.28
2. 6.28
3. 3.14
4. 0 √

q) The expression ,a=30*1000+2768;evaluates to
1. 32768 √
2. -32768
3. 113040
4. 0

r) The expression x=4+2%-8 evaluates to
1. -6
2. 6 √
3. 4
4. None of the above

s) Hierarchy decides which operator
1. Is most important
2. Is used first √
3. Is fastest
4. Operates on largest numbers

t) An integer constant in C must have
1. At least one digit √
2. At least one decimal point
3. A comma along with digits
4. Digits separated by commas

u) A character variable can never store more than
1. 32 characters
2. 8 characters
3. 254 characters
4. 1 character √

v) In C a variable cannot contain
1. Blank spaces
2. Hyphen
3. Decimal point
4. All the above √

w) Which of the following is false in C
1. Keywords can be used as variable names √
2. Variable names can contain a digit
3. Variable names donot contain a blank space
4. Capital letters can be used in variable names.

x) In C, arithmetic instruction cannot contain
1. Variables
2. Constants
3. Variable names on right side of= √
4. Constants on left side of=

y) Which of the following shows the correct hierarchy of arithmetic operations in C
1. /+*-
2. *-/+
3. +-/*
4. */+- √

z) What will be the value of d if d is a float after the operation d=2/7.0?
1. 0
2. 0.2857
3. Cannot be determined
4. None of the above

H. Write C programs for the following.

a) Ramesh' s basic salary is input through the keyboard.his dearness allowance is 40% of basic salary,and house rent allowance is 20% of basic salary.Write a program to clculate his gross salary.

```
#include<stdio.h>
#include<conio.h>
main()
{
float bs,da,hra,gs;
Clrscr();
printf("enter the Ramesh' s basic salary=");
scanf("%f",&bs);
da=(bs*40)/100;
printf("dearness allowance=%f",da);
hra=(bs*20)/100;
printf("house rent allowance=%f",hra);
gs=bs-(da+hra);
printf("ramesh' s gross salary=%f\n",gs);
getch();
}
```

b) The distance between two cities(in km)is input through the keyboard.write a program to convert and print this distance in meters,feet,inches and centimeters.

```
#include<stdio.h>
#include<conio.h>
main()
{
float distance,m,ft,in,cm;
Clrscr();
printf("Enter the distance between two cities in km=");
```

```
scanf(“%f”,&distance);
m=distance*1000;
printf(“m=%f”,m);
ft=distance*1000*3.25;
printf(“ft=%f”,ft);
in=distance*1000*3.25*12;
printf(“in=%f”in);
cm=distance*1000*3.25*12*2.5;
printf(“cm=%f”,cm);
getch();
}
```

c) If the marks obtained by a student in five different subjects are input through the keyboard, find out the aggregate marks and percentage marks obtained by the student. Assume that the maximum marks that can be obtained by a student in each subject is 100.

```
#include<stdio.h>
#include<conio.h>
main()
{
float P1,P2,P3,P3,P4,P5,sum,per,total=500;
clrscr();
printf(“enter the marks of 5 subjects=”);
scanf(“%f %f %f %f %f”,&P1,&P2,&P3,&P4,&P5);
sum=P1+P2+P3+P4+P5;
per=(sum*100)/500;
printf(“aggregate marks=%f\n”,sum);
printf(“percentage marks=%f\n”,per);
getch();
}
```

d) Temperature of a city in fahrenheit degrees is input through the keyboard. Write a program to convert this temperature into cetigrade degrees.

```
#include<stdio.h>
#include<conio.h>
main()
{
float tc,tf;
printf("enter the temp in fahrenheit=");
scanf("%f",&tf);
tc=(tf-32)*0.56
/* 5/9=0.56 */
printf("tc=%f",tc)
getch();
}
```

e) The length and breadth of a rectangle and radius of a circle are input through the keyboard. Write a program to calculate the area and perimeter of the rectangle, and the area and circumference of the circle.

```
#include<stdio.h>
#include<conio.h>
main()
{
float l,b,r,ar,pr,ac,cc;
Clrscr();
printf("enter the length,breadth and radius of circle
respectively=");
scanf("%f %f %f,&l,&b,&r);
ar=l*b;
/*area of rectangle*/
pr=2*(l+b);
/*perimeter of rectangle*/
ac=3.14*r*r;
/*area of a circle */
cc=2*3.14*r;
/*circumstances of circle*/
printf("area of rectangle=%f",ar);
```

```
printf("perimeter of rectangle =%f",pr);
printf("area of circle=%f",ac);
printf("circumference of a circle=%f",cc);
getch();
}
```

f) Two numbers are input through the keyboard into two location C and D. write a program to interchange the contents of C and D.

```
#include<stdio.h>
#Include<conio.h>
main()
{
float  a,b,c,d;
printf("enter two values");
scanf("%f %f,&a,&b);
c=b;
d=a;
printf("value of c =%f",c);
printf("value of d =%f",d);
getch();
}
```

g) If a five digit number is input through a keyboard, write a program to calculate the sum of its digits. (use the modulus operator' %').

```
#include<stdio.h>
#include<conio.h>
main()
{
int tot,a,b,c,d,e,f,g,h,I,sum;
printf("enter a five digit number=");
scanf("%d",&tot);
a=tot/1000;
b=tot%1000;
```

```
c=b/1000;
d=b%1000;
e=d/100;
f=d%100;
g=f/10;
h=f%10;
i=h/1;
Sum=a+c+e+g+i;
printf(“sum of five digits=%d”,sum);
getch();
}
```

h) if a five digit number is input through the keyboard, write a program to reverse a number.

```
#include<stdio.h>
#include<conio.h>
main()
{
int a,b,c,d,e,f,g;
printf(“enter the five digit no=”);
scanf(“%d”,&a);
b=a/10000;
c=((a%1000)/1000)*10;
d=((a%1000)/100)*100;
e=((a%100)/10)*1000;
f=(a%10)*1000;
g+b+c+d+e+f;
printf(“reverse number=%d”,g);
}
```

i) If a four digit number is input through the keyboard, write a program to obtain the sum of the first and last digit of this number.

```
#include<stdio.h>
#include<conio.h>
main()
{
int tot,a,b,c,d,e,f,g,sum;
Clrscr();
printf("enter a four digit number=");
scanf("%d",&tot);
a=tot/1000;
b=tot%1000;
c=b/100;
d=b%100;
e=d/10;
f=d%10;
g=f/1;
sum=a+g;
printf("sum of four digits=%d",sum);
getch();
}
```

j) In a town, the percentage of men is 52. The percentage of total literacy is 48. If total percentage of literate men is 35 of the total population, write a program to find the total number or illiterate men and women if the population of town is 80,000.

```
#include<stdio.h>
#include<conio.h>
main()
{
float pop=80000,perm,ptl,plm,plw,pim,piw;
perm=(pop*52)/100;
ptl=(pop*48)/100;
plm=(pop*35)/100;
plw=(pop*13)/100;
pim=perm-plm;
piw=ptl-plw;
```

```
printf(“per of illetrate men=%f”,pim);
printf(“per of illetrate women=%f”,piw);
getch();
}
```

k) A cashier has currency notes of denominations 10,50 and 100. If the amount to be withdrawn is input through the keyboard in hundreds, find the total number of currency notes of each denomination the cashier will have to give to the withdrawer.

```
#include<stdio.h>
#include<conio.h>
main()
int money,hundred,a,fifty,b,ten;
clrscr();
printf(“enter the money=”);
scanf(“%d”,&money);
hundred=money/100;
a=money/100;
fifty=a/50;
b=a%50;
ten=b/10;
printf(“hundred notes=%d”,hundred);
printf(“fifty notes =%d\n”,fifty);
printf(“ten notes=%d\n”,ten);
getch();
}
```

l) If the total selling price of 15 items and the total profit earned on them is input through keyboard, Write a program to find the cost price of one item.

```
#include<stdio.h>
#include<conio.h>
main()
float sp,pf,total,cp1
```

```
Clrscr();
printf("enter the selling price and profit earned of 15
items=");
scanf("%f %f",&sp,&pf);
total=sp+pf;
cp1=(total*6.66)/100;
printf("cost price of one item=%f",cp1);
getch();
}
```

m) If a five digit number is input through the keyboard, write a program to print a new number by adding one to each of its digits. for example if the number that is input is 12391 then the output should be displayed as 23502

```
#include<stdio.h>
#include<conio.h>
main()
{
int tot,a,b,c,d,e,f,g,h,I,j,k,l,m,n,reverse;
clrscr();
printf("enter a five digit number=");
scanf("%d",&tot);
a=tot/10000;
b=a*10000+10000;
c=tot%10000;
d=c/1000;
e=d*1000+1000;
f=c%1000;
g=f/100;
h=g*100+100;
i=f%100;
j=i/10;
k=j*10+10
l=i%10;
m=l/1;
n=m*1+1;
reverse=b+e+h+k+n;
```

```
printf(“sum of five digits=%d”,reverse);
getch();
}
```