

8.

a) Compute  $nCr$  using recursive procedure. Assume that 'n' and 'r' are non-negative integers.

```
.model small
```

```
.stack
```

```
.data
```

```
.code
```

```
N db 5
```

```
R db 5
```

```
NCR db 0
```

```
mov ax,@data
```

```
mov ds,ax
```

```
mov al,N
```

```
mov bl,R
```

```
mov NCR,0
```

```
call ENCR
```

```
int 3H
```

```
exit : mov ah,4cH
```

```
ENCR PROC
```

```
int 21H
```

```
cmp bl,al
```

```
je GAT1
```

```
cmp bl,1
```

```
je GAT3
```

```
cmp bl,0
```

```
je GAT1
```

```
dec al
```

```
cmp bl,al
```

```
je GAT2
push ax
push bx
call ENCR
pop bx
pop ax
dec bx
push ax
push bx
call ENCR
pop bx
pop ax
RET
```

```
GAT1: inc NCR
```

```
RET
```

```
GAT2:inc NCR
```

```
GAT3:add NCR,al
```

```
RET
```

```
ENCR ENDP
```

end (After executing the program check the registers to get the result )

b) Drive a Stepper Motor interface to rotate the motor in specified direction (clockwise or

counter-clockwise) by N steps (Direction and N are specified by the examiner). Introduce

suitable delay between successive steps. (Any arbitrary value for the delay may be assumed by

the student).

```
.model small
```

```
.stack

.data

N dw 800

PA equ 9800H

PB equ 9801H

PC equ 9802H

CR equ 9803H

.code

mov ax,@data

mov ds,ax

mov al,80H

mov dx,CR

out dx,al

mov dx,PA

mov al,88H

mov cx,N

again : out dx,al

call delay

ror al,01H

loop again

mov cx,N

again1: out dx,al

call delay

rol al,01H

loop again1

mov ah,4cH

int 21H
```

```
delay PROC
push cx
push bx
mov cx,0FFFH
up1 : mov bx,0FFFH
up : dec bx
jnz up
loop up1
pop bx
pop cx
RET
delay ENDP
end
```