Certainly, I can help you with the solutions based on your notes. Here are the solutions for your midterm paper:

\*\*Task 1: User and Group Management (6 marks)\*\*

```bash

# Create a new user with the username "advanceduser"

sudo adduser advanceduser

# Create a new group named "linuxmasters"

sudo groupadd linuxmasters

# Add "advanceduser" to the "linuxmasters" group

sudo usermod -aG linuxmasters advanceduser

# Set a complex password for "advanceduser"

sudo passwd advanceduser

```

\*\*Task 2: Permissions and File Handling (8 marks)\*\*

```bash

# Create a directory named "securedata" in advanceduser's home directory

mkdir /home/advanceduser/securedata

# Inside "securedata," create three files and set permissions

touch /home/advanceduser/securedata/confidential.txt

chmod 600 /home/advanceduser/securedata/confidential.txt

touch /home/advanceduser/securedata/private.doc

chmod 660 /home/advanceduser/securedata/private.doc

touch /home/advanceduser/securedata/topsecret.dat

chmod 644 /home/advanceduser/securedata/topsecret.dat

# Change ownership of "securedata" directory to advanceduser and linuxmasters group

sudo chown advanceduser:linuxmasters /home/advanceduser/securedata

```

\*\*Task 3: BASH SCRIPTING (4 Marks)\*\*

Create a BASH script (factorial.sh):

```bash

#!/bin/bash

read -p "Please enter a positive integer: " num

if [ $num -lt 0 ]; then

echo "Error: Please enter a positive integer."

else

factorial=1

for ((i=1; i<=$num; i++)); do

factorial=$((factorial \* i))

done

echo "Factorial of $num is $factorial."

fi

```

Make the script executable and run it:

```bash

chmod +x factorial.sh

./factorial.sh

```

\*\*Task 4: SSH Authentication (2 marks)\*\*

1. Configure SSH on your Linux system to allow remote login for "advanceduser":

- Edit sshd\_config file: `sudo nano /etc/ssh/sshd\_config`

- Set `PasswordAuthentication no` to disable password authentication.

- Restart SSH service: `sudo service ssh restart`

2. Generate an SSH key pair for "advanceduser":

```bash

ssh-keygen -t rsa

```

3. Copy the SSH public key to the second machine:

```bash

ssh-copy-id advanceduser@second\_machine\_IP

```

4. Attempt to SSH into the Linux system from another machine using the generated SSH key.

5. Use rsync to copy the output of the history command stored in a file called yourname\_regno.txt to your 2nd machine:

```bash

history > yourname\_regno.txt

rsync -avz yourname\_regno.txt advanceduser@second\_machine\_IP:/path/to/destination

```

Please adjust the commands and paths according to your specific setup and requirements. Make sure to replace "second\_machine\_IP" with the actual IP address of your second machine.