Correction of first-semester exam (normal session)

Exercise 1 (5 points)
algorithm exo1
r,s1,s2,s:real
begin
read(r) **(0.5 points)**
s1←3.14*r*r
s2←2*r*r   **(4 points)**
s←s1-s2
write(s) **(0.5 points)**
end

Exercise 2 (5 points: approach 3.5 points + 1.5 points for final result)

Calculate the internet speed required (in Mbps) to download an 8 gigabyte video in 0.16 seconds.

$$\text{Speed=}\frac{size(bits)}{time} = \frac{8GB\times 8}{0.16} = \frac{8\times 2^{10}\times 8}{0.16} = 409600 Mbps$$

Exercise 3 (5 points)

1-   What is the meaning of automatic information processing?
a)   Arithmetic and logical calculation **(0.5 points)**
b)   Managing and storing information **(0.5 points)**
c)   Communication and exchange of data (with: user or other computer) **(0.5 points)**

2- Give three different computer network topologies?

Bus, ring, star **(0.5×3=1.5 points)**

3- What are the different components of an operating system?

Kernel, utilities, file system, shell **(0.5×4=2 points)**

Exercise 4 (2.5 points for pseudo code + 2.5 points for flowchart=5 points)

algorithm exo4

x,f:real
begin
read(x)
if x>=-1 and x≠0 then
f←sqrt(x+1)/(exp(x)-1)
write(f)
end if
end

```
                              Start
                                |
                                v
                           Input x
                                |
                                v
   True                  x>=-1 and x≠0                  False
      |                                                    |
      v                                                    |
  f←sqrt(x+1)/(exp(x)-1)                                    |
      |                                                    |
      v                                                    |
  Display f                                                |
      |                                                    |
      +----------------------------------+-----------------+
                                         |
                                         v
                                       end
```