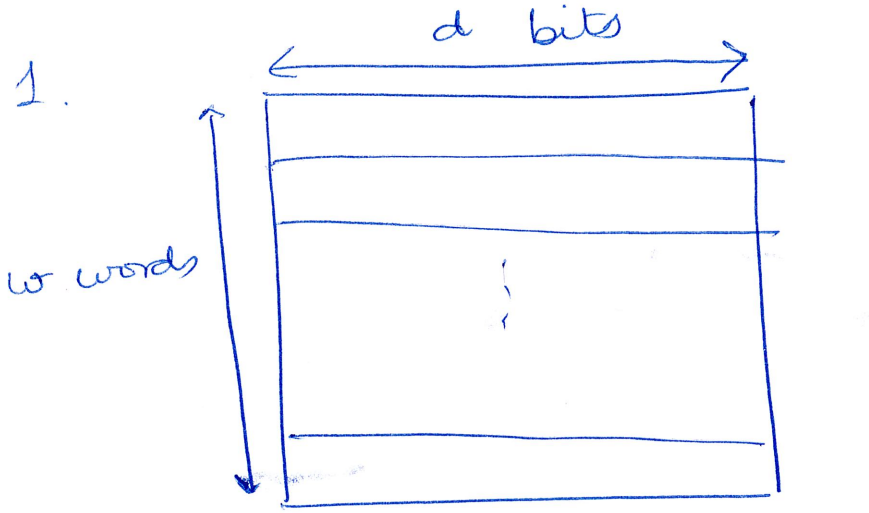
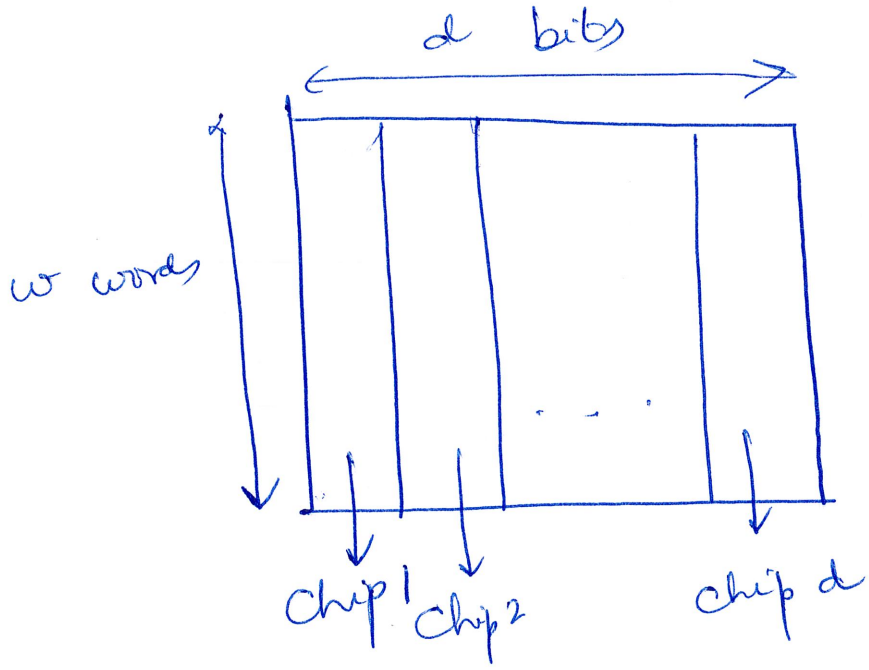
Sample Exam

Part III

1.





$$R_{\text{each chip}}(t) = e^{-\lambda t}$$

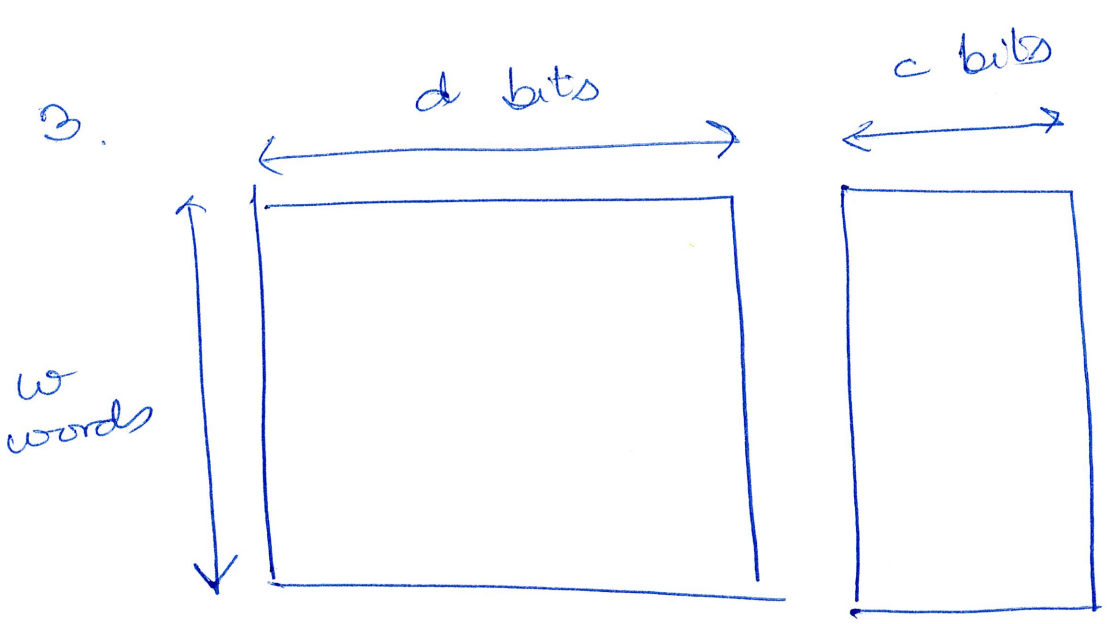
$$R_{\text{card}}(t) = \left(e^{-\lambda t}\right)^{d}$$

$$= e^{-\lambda t d}$$

2. $$MTTF_{\text{memory card}} = \int_0^{\infty} R_{\text{card}}(t)\, dt$$

$$= \int_0^{\infty} e^{-\lambda t d}\, dt = \frac{1}{\lambda d}$$

3.



Memory card works = All chips work + Any one chip fails + Any two chips fail

$$R_{\text{memory card}} = R^{c+d} + C(c+d,1)(1-R)R^{c+d-1} + C(c+d,2)(1-R)^2 R^{c+d-2}$$

$$R(t) = e^{-\lambda t}$$