

※ 考生請注意：本試題不可使用計算機

1. What is the theoretical minimum system bandwidth needed for a 100Mbps signal using 32-level PAM without ISI (20%)
2. Please describe in detail the principle of asymmetric-key cryptography. (20%)
3. A (15, 5) cyclic code has a generator polynomial as follows:
$$g(X)=1+X+X^2+X^5+X^8+X^{10}.$$

Find the code polynomial for the message $m(x)=1+X^2+X^4$. (20%)
4. Please describe the four types of trade-offs that can be accomplished by using an error-correcting code. (20%)
5. Describe in detail the Shannon-Hartley theorem. (20%)