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MMTE-005/(P)

**M. Sc. (Mathematics with
Applications in Computer
Science) M. Sc. (MACS)
Term-End Examination
December, 2018**

CODING THEORY

Time : $1\frac{1}{2}$ Hours

Maximum Marks : 40

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- Note :** (i) There are *two* questions in this paper, totalling 30 marks.
(ii) Answer both of them.
(iii) The remaining 10 marks are for viva-voce.
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(A-12) P. T. O.

1 2 3 4 5

1. Write a program in C language for computing the CRC with the CRC polynomial $x^7 + x^6 + x^4 + 1$. Compute the CRC for the following message using the program above : 15

10000011111010100111010101101000

2. Write a program in C language that takes the generator matrix of a linear code over F_3 and gives all the codewords of the code as well as the minimum distance of the code as output. Use it to find the codewords and the minimum distance of the linear code over F_3 with generator matrix : 15

$$G = \begin{bmatrix} 1 & 2 & 0 & 1 & 0 & 2 & 1 & 0 \\ 0 & 1 & 1 & 0 & 2 & 2 & 0 & 2 \\ 0 & 0 & 1 & 1 & 1 & 0 & 2 & 1 \\ 0 & 0 & 0 & 1 & 2 & 1 & 0 & 1 \end{bmatrix}$$