Sample Question Paper

GENERAL APTITUDE

1. The square of the binary number 1001 in hexadecimal is
   a. 81
   b. 51
   c. 121
   d. A1

2. Which of the following modes of data transfer is the fastest?
   a. DMA
   b. Interrupt-based
   c. Polling
   d. All are equally fast

3. Heap Sort runs at
   a. O(log n)
   b. O(n log n)
   c. O(n²)
   d. O(n² log n)

4. What is the chance that a leap year selected at random will contain 52 Sundays?
   a. 1
   b. 3/7
   c. 1/7
   d. 2/7

STRUCTURAL ENGINEERING

1. A short CI column of hollow circular section has projecting bracket carrying a load of 10 tonnes. The load line is off the column by 20cm. The external diameter of the column is 350mm and thickness of metal is 25 mm. Find the maximum stress intensity in the section.
2. A rectangular beam section of 300 mm width and 500 mm effective depth is reinforced with 4 bars of 20 mm diameter, what shear reinforcement is required to resist 200 kN shear (use working stress method).

3. A bar of steel 24 mm in diameter was subjected to a tensile load of 60 kNs and measured extension on a 20-cm gauge length was 0.009 cm and the change in diameter was 0.00375 cm. Calculate the Bulk modulus? precisely at noon

4. What is the allowable load carrying capacity of a circular column section of 400 mm diameter reinforced with 6x25 mm diameter bars adequately tied with spirals? Consider concrete of grade M25 and steel of grade Fe 415.