Reg. No. : | | | | | | | | | | | |

K 6427

M.E. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Elective

Structural Engineering

ST 1623 — CAAD FOR STRUCTURES

(Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define : Rendering.
2. What is meant by text mode graphics?
3. Define 'banding' and 'symmetry' of a stiffness matrix.
4. What are the methods used for finite element formulation?
5. List any four commercially available softwares for structural design.
6. What are the elements of detailed drawing for R.C. members?
7. Define : Objective function, constraints.
8. What are slack and surplus variables?
9. What is a neural network?
10. What are the basic operations used in GAs?

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are the various benefits achieved by implementing CAD in design offices? (8)

(ii) Discuss about the graphic routines for the commonly used graphic input devices. (8)

Or

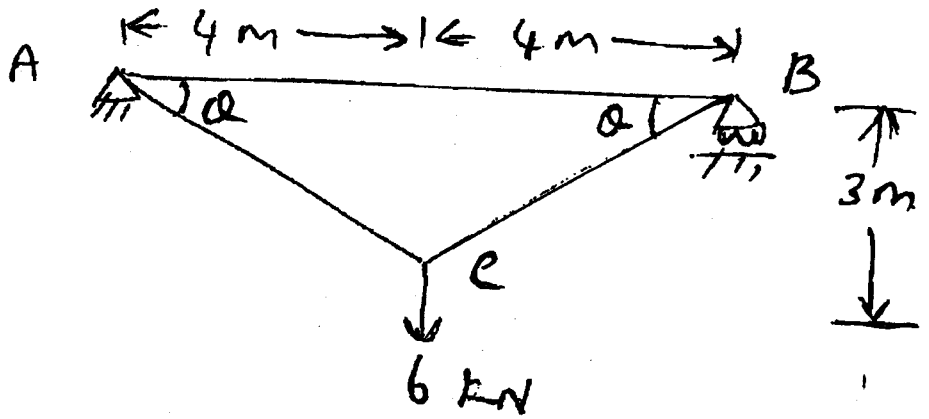
(b) Study a CAD package and describe the drawing entities available in detail.

12. (a) (i) Write notes on automatic mesh generation with an illustrative example. (8)

(ii) What do you understand by the finite element model? Give an example of modelling in structural engineering. (8)

Or

(b) Write pre-processing file for analysing the steel structure shown in fig.



(Given $E = 2 \times 10^5$ N/mm^2)

Cross sectional area of *AB* is 100 mm^2 and of *AC* and *BC* is 150 mm^2 each.

13. (a) Give the algorithm and flow chart for the design of R.C. column.

Or

(b) Give the algorithm and flow chart for the design of a steel column.

14. (a) Name the various types of optimization problems and give one design example for each.

Or

(b) (i) State any five engineering applications of optimization.

(ii) What is graphical optimization and what are its limitations?

15. (a) (i) How is cross over operation performed in GAs? (8)

(ii) What is KBES (Knowledge based expert system)? What are its advantages and limitations? (8)

Or

(b) (i) How is neuron modelled in neural network based models? (8)

(ii) What is the purpose of mutation? How is it implemented in GAs? (8)
