APPLIED STRUCTURAL STATICS AND DYNAMICS – AAR 1206

INSTRUCTIONS: **Time:** 2 Hours
Answer any THREE questions. All questions carry equal marks.

QUESTION 1

a)   State and describe the various types of loads in structures.

(5 marks)

b)   Describe   (i)   the Allowable Stress Design
                      (ii)   the Limit State Design

What is the main difference between these design approaches?

(10 marks)

c)   'For a structure to fulfill the functions which it is intended to serve it must satisfy certain criteria.' What are they?

(5 marks)

QUESTION 2

a)   Define (i)   tensile stress
                (ii)   compressive stress
                (iii)   shear stress
                (iv)   strain

(8 marks)

b)   Sketch a stress-strain diagram for structural steel in tension. Show significant points.

(12 marks)

QUESTION 3

a)   What is meant by   (i)   statically determinate structure
                             (ii)   statically indeterminate structure
                             (iii)   redundant supports
                             (iv)   degree of indeterminacy

(7 marks)

b) State the basic concepts of non-rigid body mechanics.

(3 marks)

c) Determine the resultant of the concurrent system of forces shown in Fig. Q3c
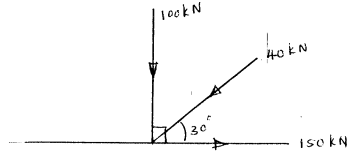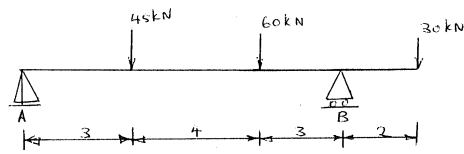
(4 marks)

Fig. Q3c

d) A beam is loaded as shown in Fig. 3d. Determine the reactions at A and B.

(4 marks)

Fig. 3d

e) The resultant of two coplanar forces is 40 kN. If one of the forces is 24 kN at O^o, determine the other force.

(2 marks)

QUESTION 4

a) What are the basic types of structural forms and how can they be used in different structural situations.

(20 marks)

END OF EXAMINATION

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