No. of Printed Pages : 4

BAR-024

BACHELOR OF ARCHITECTURE (B.Arch.)

Term-End Examination

December, 2016

00263

BAR-024 : THEORY OF STRUCTURES – III

Time : 3 hours *Maximum Marks : 70*

Note : *Question no. **1** is **compulsory**. Attempt any **four** questions from the remaining questions. Use of scientific calculator is permitted.*

1. Choose the most appropriate answer from the options given in questions (a) to (g) below : *7×2=14*

(a) For a fixed support in a plane structure, the total number of reactions, at the most, may be

(i) 2

(ii) 3

(iii) 5

(iv) 6

(b) A structure should be

(i) strong

(ii) ductile

(iii) unstable

(iv) Both (i) and (ii)

(c) For stability, centre of gravity of a structure should be

(i) as low as possible

(ii) as high as possible

(iii) near to its outer edge

(iv) outside its plan area

(d) The moment of inertia of a rectangular area about an axis passing through its centre of gravity is given as

(i) $bd^3/3$

(ii) $bd^3/12$

(iii) $bd^3/36$

(iv) $bd^4/584$

(e) In pin jointed trusses, members are subjected to

(i) axial forces

(ii) moments

(iii) axial forces and shear forces

(iv) moments and shear forces

(f) Which of the following is a ductile material ?

(i) Stone

(ii) Brick

(iii) Steel

(iv) Glass

(g) Euler's theory is applicable to

(i) short columns

(ii) long columns

(iii) tension members

(iv) Both (i) and (ii)

2. (a) What do you understand by a Funicular polygon ? Explain briefly. 7

(b) Write steps of the graphical method of determining resultant of a given system of coplanar forces. 7

3. (a) Draw Shear force and Bending moment diagrams for the beam shown in Figure 1. 7

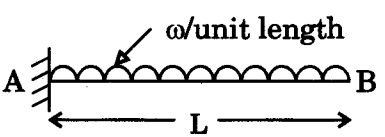

Figure 1

(b) Draw neat line sketches of any two types of trusses. 7

4. (a) Write assumptions taken in the theory of pure bending. 7

(b) Differentiate between failures of short and long columns. 7

5. (a) Derive expression for calculating Euler's load for standard case of a column. 7

(b) Discuss a way of improving the capacity of a long column. 7

6. (a) Draw a neat sketch of stress-strain curve of mild steel. Show various prominent points on it. 7

(b) Explain the difference between the terms 'Stress' and 'Strength' for a material. 7

7. Write short notes on any ***two*** of the following : *2×7=14*

(a) Centre of Gravity

(b) Concept of Stability for a Column

(c) Moment of Inertia