

F. Y. B.ARCH. SEM – I (2010 COURSE) : SUMMER - 2018
SUBJECT: THEORY OF STRUCTURES I AND BUILDING MATERIALS-I

Day: **Monday**
Date: **30/04/2018**

S-2018-3315

Time: **02.00 PM TO 05.00 PM**
Max Marks: 100

N.B:

- 1) Answer **ANY THREE** questions from Section- I.
- 2) Answer **ANY FOUR** questions from Section -II.
- 3) Answer to the **TWO** Sections should be written in **SEPARATE** answer books.
- 4) Neat diagrams must be drawn **WHEREVER** necessary.
- 5) Figures to the right indicate **FULL** marks.
- 6) Use of Non- programmable calculator and steel tables is **ALLOWED**.
- 7) Assume suitable data if **NECESSARY**.

SECTION-I

- Q.1** Answer any **FOUR** of the following: **(20)**
- a) State and explain Lami's theorem with an illustrative sketch.
 - b) Explain different types of beams.
 - c) Explain with a suitable illustrative sketch, what you understand by point of contraflexure and point of zero bending moment. Explain its significance.
 - d) Explain centroid. Draw 4 different simple standard geometric figures and locate their centroid showing salient distances with respect to the original figure.
 - e) What are the different methods for finding out forces in the members of a pin jointed truss? Explain suitability of each method.
- Q.2** a) Find out centroidal moment of Inertia of an unsymmetrical I section, about **(10)**
horizontal axis through its centroid. The top flange is 4cm x 2cm, web is 2cm x 8cm and bottom flange is 12cmx2cm.
- b) A simply supported beam AB of 6m span is subjected to a central point load of **(10)**
4t (at point C) and a UDL of 2t/m from C to D. Draw SFD and BMD for this beam showing all the salient points.
- Q.3** a) A particle at 'A' is subjected to three coplanar forces P, Q, R. This force **(10)**
system is in equilibrium. If P is 4t in vertically downward direction and Q is 3t, horizontal and directed towards right, find out R. Also find out angles which R makes with P and Q.
- b) Draw a simple cantilever type of truss having 6 members and 5 joints (out of **(10)**
which, 2 are joints at supports). Consider a suitable vertical load at a joint which is at free end of the cantilever. Now find out forces in any four members of the truss. Also write down the nature of force in those members.
- Q.4** a) A circular plane is 6cm in diameter. Find out its Area and moment of inertia **(06)**
about centroidal axis.
- b) State and explain Varignon's principle of moments with a simple example. **(06)**
- c) What will be moment of inertia of the plane mentioned in Q. 4 (a) above, about **(08)**
horizontal axis through its bottom most point.

P.T.O

SECTION-II

- Q.5** What is Pointing? What are the advantages of Pointing? Briefly discuss the various types of pointing recommended for masonry. (10)
- Q.6** What are the various load bearing & non-load bearing components in a building? Explain them in brief. (10)
- Q.7** How does the entry of dampness in a building damage the structures? What are the various types of damp proofing methods employed? (10)
- Q.8** What are the different types of Rubble masonry? Discuss the important principles of construction to ensure good stone masonry. (10)
- Q.9** Explain the composition & properties of cement used for construction. (10)
- Q.10** Write short notes on: (10)
- a) Bonds in brick masonry
 - b) Types of plaster finish

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