

Seat No. : _____

XQ-122

B.Sc. (FIRE AND SAFETY) Sem. II

April-2013

Sub-Mechanics of Solid And Town Planning

Time : 3 Hours]

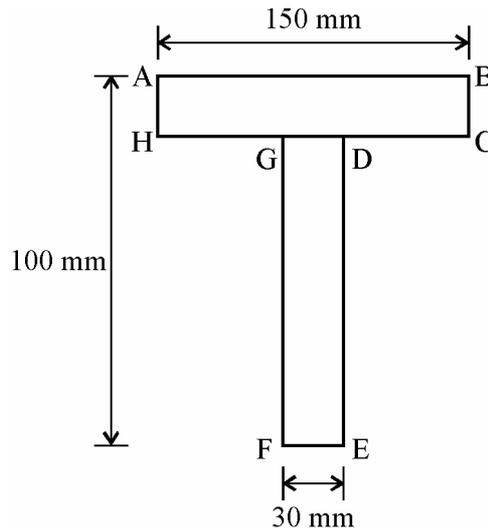
[Max. Marks : 70

1. (a) What is Mechanics ? In how many branches mechanics has been divided ? What is force, unit of force and type of forces ? 7

OR

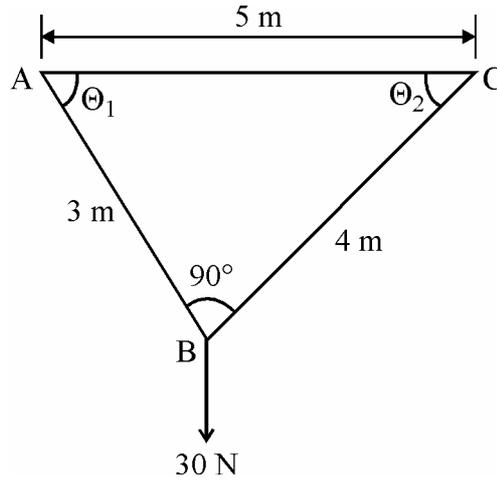
What is parallelogram law ? Explain with the help of diagram.

- (b) Define centre of gravity & find out centre of gravity of 150 mm × 100 mm × 30 mm T section. 7



OR

Define Lami's theorem. A weight of 30 N is suspended by two strings of 4 m and 3 m length. The horizontal distance between two fixed points is 5 m as shown in fig. Calculate tension in both the strings. 7



2. (a) Explain with the help of diagram type of support and support reactions & list out types of moment with the help of diagram. 7

OR

Explain in details : What is friction, types of friction and with the help of figures clarify static dynamic & limiting friction.

- (b) Define Elastic limits, Hooks Law, Young's Modulus. 7

OR

Differentiate between simple stress and simple strain and explain tensile stress, compressive stress, tensile strain, compressive strain.

3. (a) A building has how many components, briefly describe each component. 7

OR

What is deep foundation, its types and explain pile foundation, draw sketches of various pile foundations.

- (b) List out 5 types of doors and give a list of types of stairs. Explain quarter turn stair with the help of a diagram. 7

OR

Define arches and types of arches. What is the difference between Lintel and an Arch. Which are the materials used in construction of Lintel ?

4. (a) Explain planning survey in detail. 7

OR

In selection of site for Urban Development what are the points to be considered ?

- (b) Write short notes on any **two** : 7
- (1) Drainage and water supply
 - (2) Multi storied flats
 - (3) Commercial complex
 - (4) Group Housing

OR

Describe the types of roads in urban areas and compare arterial roads, local roads and streets.

5. Fill in the blanks/give appropriate answer. Each carries one mark. 14

- (1) Force = mass x ?
- (2) One mega Newton = _____N
- (3) Resultant $R = \sqrt{P^2 + Q^2}$
- (4) $\frac{P}{\sin \theta} = \frac{Q}{\sin \theta} = \frac{R}{\sin \theta}$?
- (5) If deformation disappears after removal of load the material is within its _____ limit.
- (6) An escalator is vertical transportation structure. (YES/NO)
- (7) Roof having sloping top surface makes it suitable in snow fall areas. Name of roof _____
- (8) The maximum daily consumption of water is about how many times the average daily consumption ?
 - (a) 2 times
 - (b) 1.5 times
 - (c) 2.5 times
 - (d) 3 times
- (9) Fire hydrants should be located in a circle of about _____ metres to _____ metres.
- (10) Write formula of co-efficient of friction.
- (11) Which symbol is used for Young's modulus ? (F,B,E,C)
- (12) An arch is a structure which is constructed to span across an opening. (TRUE/FALSE)
- (13) A door consists of two parts namely _____ & _____.
- (14) Full form of R.C.C.

