BLACK DIAMOND SCHOOL OF ENGINEERING

CIVIL ENGINEERING DEPARTMENT

QUESTION BANK

6TH SEMESTER

SUB: STRUCTURAL DESIGN-II

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[Steel design-II]
6th sem, civil

[2 marks questions]

(1) (a) What is meant by the design of steel structure?
(b) Name the grade of steel for standard structural design?
(c) How structural steel is classified?
(d) What is meant by ISJC 100 @ 56.9 N/m structural steel section?
(e) Name the various types of major loads that may be act on a steel structure.
(f) What are the connections are used in steel design?
(g) What do you mean by pitch distance?
(h) What is welding in structural design?
(i) How the size of rivet is determined?
(j) Define slenderness ratio?

[5 marks questions]

(2) (a) Write down the advantages of steel structure?
(b) Explain special consideration in steel design?
(c) Discuss advantages and disadvantages of bolted connections?
(d) State assumption in design of bearing bolt?
(e) What are the factors that determine the buckling class of structural elements? Determine the buckling class of ISHB @ 806.4 N/mt?

(a) Determine the plastic section modulus of a T-section having flange width 200mm, flange thickness 15mm, depth of web 180mm and width of web 20mm?

(b) Design a suitable slab base for a column section ISHB 200 @ 365.9 N/m supporting an axial load of 400kN. The base plate is to rest on a concrete pedestal of M20 grade. Use steel of grade Fe-410?

(c) Explain buckling class of cross-section in compression member?

[10 marks questions]

(1) calculate the strength of a 20mm diameter bolt of grade 4.6 for double covers butt joint each of the cover plate being 8mm thick and main plates to be joined are 12mm thick?

(2) calculate the design compressive load for an ISHB 250 @ 536.6 N/m, 4m high. The column is restrained in erection only at the both ends. It is to be used as an encased column in a single storey building?

(3) Design a single angle section for a tension member of a roof truss to carry a factored tensile force of 225 kN. The member is subjected to the permissible reversal action of stress due to the action of wind. The length of the member is 3 mt. use 20mm shop bolts of grade 4.6 for the connections?

Steel design - II
6th sem, civil

2 marks questions

(1) (a) what do you mean by gauge distance?
(b) The diameter of the bolt is 18 mm then what is the diameter of bolt hole?
(c) Define end distance and edge distance.
(d) How can you define tensile strength of the plate?
(e) what is the value of permissible shear stress?
(f) Define a column?
(g) write down the different types of welds?
(h) Define slab base?
(i) what are the types of slab base?
(j) Define a beam?

5 marks questions

(2) (a) write down different types of butt welds with its sketches?
(b) Explain block shear failure with sketches for the case of bolted connections?
(c) Determine plastic moment capacity of the unsymmetrical I-section, Given size. Top flange 100mm x 20mm, bottom flange - 200mm x 20mm and web - 200mm x 20mm.
(d) write down the advantages of welded connection over bolted connection?

(e) Explain buckling class of cross-section in compression members?

(f) What do you mean by slip resistance connections? Explain the principle of high strength friction grip bolt?

(g) Write short notes on web buckling & web crippling and properties of structural steel.

(h) Discuss advantages and disadvantages of bolted connection.

[10 marks questions]

(1) Find the maximum force that can be transmitted through a double bolted chain lap joint consisting of 6 bolts in two rows. Given that M16 bolts are grade 4.6 and plates of Fe 410 are used. The thickness of the plates connected are 10mm and 12mm?

(2) Design a welded lap joint for two plates of size 120mm x 8mm and 120mm x 12mm for maximum efficiency. Assume shop welding and Fe410 grade steel?

(3) Determine the design axial load on the column section ISMB 400, given that the height of column is 3.0m and that is pin ended. Also assuming the following $f_y = 250 N/mm^2$, $f_u = 410 N/mm^2$ and $E = 2 \times 10^5 N/mm^2$?