Q 1. V_{us}/d depends on

a) A_{sv}

b) spacing of shear reinforcement

c) grade of steel

d) all of these.

Q 2. The rectangular beam of width, 300 mm is having overall depth of 600 mm. The concrete grade is M20 and the grade of reinforcing steel is Fe415. The tensile reinforcement is provided by 5-20 mm dia bars. The clear cover is 25 mm. The design shear strength of concrete, τ_c, MPa for M20 grade of concrete is given as (100 Ast/bd, τc, MPa) (0.25,0.36), (0.50, 0.48), (0.75, 0.56), (1.00, 0.62), (1.25, 0.67), (1.50, 0.72), (1.75, 0.75), (2.00, 0.79), (2.25, 0.81), (2.50, 0.82) As per limit state, the critical shear capacity of beam is equal to :

(a) 76.582 kN (b) 102.109 kN (c) 127.636 kN (d) 153.164 kN

Q 3. A rectangular beam of width 300mm and overall depth 450mm is subjected to a factored shear of 350 KN. The tension side is provided with 4- 20mm dia bars. Assuming M25 grade of concrete, clear cover as 25mm and Fe415 steel, comment on the shear design of the beam. The design shear strength of concrete, τ_c, MPa for M25 grade of concrete is given as (100 Ast ,τc, MPa) (0.25,0.36), (0.50, 0.49), (0.75, 0.57), (1.00, 0.64), (1.25, 0.70), (1.50, 0.74), (1.75, 0.78), (2.00, 0.82), (2.25, 0.85), (2.50, 0.88).

(a) Design Shear reinforcement is needed.

(b) Minimum shear reinforcement is needed

(c) No shear reinforcement is needed

(d) None of the above.

Q 4. A rectangular beam of width 300mm and overall depth 450mm is provided with 20mm dia. Fe 415 bars on the tension side with a clear cover of 25mm. The beam is made with concrete having a $\tau_{c,max}$ = 3.1 MPa. For the reinforcement provided and the grade of concrete used, it may be assumed that the τ_c= 0.80 MPa. The design shear in beam B1 is 350 KN and in beam B2 is 450 KN. Considering the provisions of IS: 456-2000, which of the following is true?

a) Shear reinforcement should be designed for 250 kN for beam B1 and the section for beam B2 should be revised.
b) Nominal shear reinforcement is required for beam B1 and the shear reinforcement should be designed for 350 kN for beam B2.
c) Shear reinforcement should be designed for 250 kN for beam B1 and the shear reinforcement should be designed for 350 kN for beam B2.
d) The sections for both beam B1 and B2 should be revised.

Q 5. The rectangular beam of width, 300 mm is having overall depth of 600 mm. The concrete grade is M20 and the grade of reinforcing steel is Fe415. The tensile reinforcement is provided by 5-20 mm dia bars. The clear cover is 25 mm. The design shear force is 500.0 kN The design shear strength of concrete, τc, MPa for M20 grade of concrete is given as (100 Ast/bd ,τ_c, MPa) (0.25,0.36), (0.50, 0.48), (0.75, 0.56), (1.00, 0.62), (1.25, 0.67), (1.50, 0.72), (1.75, 0.75), (2.00, 0.79), (2.25, 0.81), (2.50, 0.82). For M20 grade of concrete, the maximum shear stress permitted is 2.80 MPa. The shear stress, τ_v is equal to

(a) 4.42 MPa (b) 3.69 MPa (c) 2.95 MPa (d) 5.16 MPa

Q 6. The rectangular beam of width, 300 mm is having overall depth of 600 mm. The concrete grade is M20 and the grade of reinforcing steel is Fe415. The tensile reinforcement is provided by 5-20 mm dia bars. The clear cover is 25 mm. The design shear force is 500 kN The design shear strength of concrete, τ_c, MPa for M20 grade of concrete is given as (100 Ast/bd ,τ_c, MPa) (0.25,0.36), (0.50, 0.48), (0.75, 0.56), (1.00, 0.62), (1.25, 0.67), (1.50, 0.72), (1.75, 0.75), (2.00, 0.79), (2.25, 0.81), (2.50, 0.82). For M20 grade of concrete, the maximum shear stress permitted is 2.80 MPa. The spacing of stirrups for 2-legged stirrup of diameter 12 mm is closer to:
(a) 100 mm (b) 200 mm (c) 300 mm (d) Increase depth of beam

Q 7. Calculate the effective width of a RCC T-beam section having the following sectional properties: Distance between points of zero moments in the beam = 3000mm; Width of flange = 1800mm; Thickness of flange = 150 mm; Breadth of the web = 200 mm; Effective depth = 300 mm; Reinforcement = 4-20 mm diameter Fe500 steel bars on tension side. Grade of concrete = M25.

(a) 1800mm (b) 1400mm (c) 1600mm (d) 1200mm

Q 8. A balanced reinforced concrete beam of M25 grade and width 300mm is having a factored limiting moment of 125 kNm. The grade of steel is of Fe415. The effective depth (to nearest multiple of 10) of the section is

(a) 450mm (b) 350mm (c) 300mm (d) 250mm

Q 9. Types of shear failures can be of

(a) Shear- tension

(b) Shear- compression

(c) Shear- bond

(d) All of these.

Q 10. The rectangular beam of width, 300 mm is having overall depth of 600 mm. The concrete grade is M20 and the grade of reinforcing steel is Fe415. The tensile reinforcement is provided by 5-20 mm dia bars. The clear cover is 25 mm. The design shear force is 350.0 kN The design shear strength of concrete, τ_c, MPa for M20 grade of concrete is given as (100 Ast/bd, τ_c, MPa) (0.25,0.36), (0.50, 0.48), (0.75, 0.56), (1.00, 0.62), (1.25, 0.67), (1.50, 0.72), (1.75, 0.75), (2.00, 0.79), (2.25, 0.81), (2.50, 0.82). For M20 grade of concrete, the maximum shear stress permitted is 2.80 MPa. The spacing of stirrups for 2-legged stirrup of diameter 12 mm is closer to:
(a) 90 mm (b) 130 mm (c) 180 mm (d) 220 mm