



SURYA POLYTECHNIC COLLEGE, VIKIRAVANDI-605 602.

DEPARTMENT OF CIVIL ENGINEERING

Model Question Paper - I

Subject Name : STRUCTURAL ENGINEERING

Q.P. Code : 410

Time : 3 Hours

Subject Code : 4010510

Max. Marks : 100

[N.B: - (1) Answer all 10 Questions in PART – A and each Question carries 3 Marks.

(2) Answer division (a) or division (b) of each Question in PART – B and each Question carries 14 Marks.]

PART –A

10 x3=30Mark

1. What is under reinforced & over reinforced & section?
2. What is mean by cantilever beam ?
3. State the advantages of T-beam ?
4. what is mean by shear reinforcement?
5. What is the maximum A_{st} value for one way slab?
6. What is the maximum permitted spacing for main reinforcement?
7. Define column footing.
8. State the IS code provision for footing
9. What are the types of Tension member?
10. What are the different types of connections in steel member?

PART-B

(5x14=70 Mark)

11. A). A Cantilever beam is subjected to factored bending moment of 90kn.m. the breadth of beam is 250mm. determine the effective depth and the area of steel required for the beam is M15 grade of concrete and Fe 415 steel are used

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(OR)

B) A doubly reinforced beam section is 250mm x 500mm and provided with 2 bars of 12mm bars as compression steel and 4 bars of 25mm bars as tension steel. These reinforcement are provided at an effective cover of 40mm. Determine the ultimate moment of resistance of the beam section. Use M_{20} concrete and Fe 415 steel.

12.A) A floor slab of a laboratory is 110mm thick and is supported on 'T' beams spaced at 3.3m centres. The slab carries a live load of 3 KN/m^2 and floor finished load of 1.0 KN/m^2 . The beams are 6.3m. Design the beam for flexure using M20 grade concrete and Fe 415 grade steel by limit state method.

(OR)

B) A roof slab of a Drawing hall is 110mm thick and is supported on T- beam spaced at 4m centers. The slab carries an imposed load of 1.5 KN/m^2 and weathering course of 1.70 KN/m^2 . T- beam is supported with 300mm thick wall with clear span of 7m. Design the beam for flexure using M20 & Fe 415 grade.

13.A) A simply supported slab has to be provided for roof of clear dimensions 4m X 7m width of supporting wall 300mm. the weight of weathering course over the slab is 1 KN/m^2 . Access is to be provided to the roof. Design the slab using M20 & Fe415 grade and draw the cross section.

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(OR)

B. Design the interior panel of a continuous two way slab of effective span $5.5 \text{ m} \times 4.5 \text{ m}$ to carry an imposed load of 4 KN/m^2 by limit state method. The floor finish load 1 KN/m^2 . Use M20 grade Fe 415 steel.

14.A) A column of $600 \times 400 \text{ mm}$ c/s and 3m long effectively held in position and restrained against rotation at both ends is provided with 6 bars of 22mm dia. determine the strength of column. use M20 GRADE concrete & Fe 415 steel

(OR)

B) Design a circular column to carry an axial load of 800KN. The unsupported length of the column is 3.7m. it is hinged at both ends use transverse reinforcement. use M20 grade concrete & Fe 415 steel

15.A) An ISA $80 \times 50 \times 10 \text{ mm}$ is connected by fillet weld and used as a tension member. Thickness of plate is 12mm. yield strength and ultimate strength of material is $f_y = 250 \text{ MPa}$, $f_u = 410 \text{ MPa}$. Length of connection is 120 mm, Determine the strength of the member.

(OR)

B) Determine the design tensile strength of steel plate in which 2 rivets of 18.5mm dia. rivets are available width and thickness of plate are 160mm and 8mm respectively. Take $f_y = 250 \text{ N/mm}^2$ and $f_u = 450 \text{ N/mm}^2$.

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