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**Government polytechnic Vaishali**

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**Lecture plan (5th sem)**

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| **NAME OF THE****Lecturer** | **Mr. Rambabu kumar** |
| **Department** | **Civil Engineering** |
| **INSTITUTE** | **Government Polytechnic Vaishali** |
| **Lecture plan** | **Fifth semester** |
| **Session** | **2018-21** |
| **Subject name and code** | **Theory of Structure (1615501)** |

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| Unit | Topics | No of Period | Book |
| 1 | **Direct And Bending Stresses** |  |  |
|  | 1.1 Concept of direct and eccentric loads, eccentricity about one principal axis, nature of stresses, maximum and minimum stresses, resultant stress distribution diagram. | Lecture(L) L27, L28 | B.C. Punmia and C S Reddy |
|  | 1.2 Condition for no tension or zero stress at extreme fiber, limit of eccentricity, core of section for rectangular and circular cross sections. | L29, L30, L31 | B.C. Punmia and C S Reddy |
|  | 1.3 Columns, pillars and chimneys of uniform section subject to lateral wind pressure, coefficient of wind resistance, stress distribution at bases | L32, L33,L34 | B.C. Punmia and C S Reddy |
| 2 | Slope and Deflection |  |  |
|  | 2.1 Concept of slope and deflection, stiffness of beam | L1, L2 | B.C. Punmia and C S Reddy |
|  | 2.2 Relation between slope, deflection and radius of curvature, differential equation (no derivation), double integration method to find slope and deflection of simply supported and cantilever beam | L3, L4, L5 | B.C. Punmia and C S Reddy |
|  | 2.3 Macaulay’s method for slope and deflection,, application to simply supported and cantilever beam subjected to concentrated and uniformly distributed load | L6, L7 | B.C. Punmia and C S Reddy |
| 3. | Fixed Beam |  |  |
|  | 3.1 Concept of fixity, effect of fixity, advantages and disadvantages of fixed beam. | L8 | B.C. Punmia and C S Reddy |
|  | 3.2 Principle of superposition. | L9 | B.C. Punmia and C S Reddy |
|  | 3.3 Fixed end moments from first principle for beam subjected to UDL over entire span, central point load, Point load other than mid span. | L10 | B.C. Punmia and C S Reddy |
|  | 3.4 Application of standard formulae in finding moments and drawing S.F. and B.M. diagrams for a fixed beam (Derivation need not be asked in the examination) | L11 | B.C. Punmia and C S Reddy |
| 4 | Continuous Beam |  |  |
|  | 4.1 Definition, effect of continuity practical example, nature of moments induced due to continuity, concept of deflected shape | L12, L13 | B.C. Punmia and C S Reddy |
|  | 4.2 Clapeyron’s theorem of three moment (no derivation) | L14 | B.C. Punmia and C S Reddy |
|  | 4.3 Application of theorem maximum up to three spans and two unknown support moment only, Support at same level, spans having same moment of inertia subjected to concentrated loads and uniformly distributed loads over entire span | L15,  | B.C. Punmia and C S Reddy |
|  | 4.4 Drawing SF and BM diagrams for continuous beams. | L16 | B.C. Punmia and C S Reddy |
| 5. | Moment Distribution Method |  |  |
|  | 5.1 Introduction, sign convention | L17 | B.C. Punmia and C S Reddy |
|  | 5.2 Carry over factor, stiffness factor, distribution factor. | L18 | B.C. Punmia and C S Reddy |
|  | 5.3 Application of moment distribution method for various types of continuous beams subjected to concentrated loads and uniformly distributed load over entire span having same or different moment of inertia up to three spans and two unknown support moment only, SF and BM diagrams (Supports at same level) | L19, L20, L21 | B.C. Punmia and C S Reddy |
|  | 5.4 Application of moment distribution method to single storey single bay symmetrical portal frames, SF and BM diagrams | L22 | B.C. Punmia and C S Reddy |
| 6. | Columns |  |  |
|  | 6.1 Definition, classification of column | L23 | B.C. Punmia and C S Reddy |
|  | 6.2 Buckling of axially loaded compression member, Types of end conditions for column, effective length, radius of gyration, slenderness ratio | L24 | B.C. Punmia and C S Reddy |
|  | 6.3 Assumptions in the theory of long column Euler’s theory, buckling load and Rankin’s theory, crippling load , factor of safety, safe load | L25 | B.C. Punmia and C S Reddy |
|  | 6.4 Application of Rankin’s and Euler theory, designing solid circular or hollow circular sections | L26 | B.C. Punmia and C S Reddy |