**Program: B.E. Civil Engineering**

Curriculum Scheme: Revised 2016

Examination: Fourth Year Semester :VIII

Course Code CE C801 and Course Name: Design and Drawing of Reinforced Concrete Structures

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| --- | --- |
|  | MODULE 1 COMPREHENSIVE DESIGN OF BUILDING |
| 1.1 | The section of singly reinforced beam in which the permissible stress in steel and concrete reaches earlier than that in concrete is called |
| Option A: | Under reinforced section |
| Option B: | Over reinforced section |
| Option C: | balanced section |
| Option D: | Economic section |
|  |  |
| 1.2 | The Partial factor of safety for steele in LSM may be taken as  |
| Option A: | 1.5  |
| Option B: | 1.15  |
| Option C: | 1.78 |
| Option D: | 3  |
|  |  |
| 1.3 | Characteristic strength is defined as the value of strength below which not more that …….% of the test results are expected to lie. |
| Option A: | 5 |
| Option B: | 15 |
| Option C: | 25 |
| Option D: | 50 |
|  |  |
| 1.4 | The design Strength of Concrete is taken as \_\_\_\_\_\_\_\_\_\_ in Limit State of Collapse |
| Option A: | 0.45fck |
| Option B: | 0.67fck |
| Option C: | Fck |
| Option D: | 0.23fck |
|  |  |
| 1.5 | Partial safety factor in case of dead load for stability against overturning or stress reversal is  |
| Option A: | 1.2 |
| Option B: | 0.9 |
| Option C: | 0.7 |
| Option D: | 2.3 |
|  |  |
| 1.6 | Live load comprises of  |
| Option A: | Permanently attached loads |
| Option B: | Temporarily attached loads whose value and position may change |
| Option C: | Permanent as well as temporary loads |
| Option D: | Snow loads |
|  |  |
| 1.7 | The balance moment of resistance of the singly reinforced beam effective depth of beam is 450 mm having is 139.73 kNm. If M20 concrete and Fe 415 steel are used ,the width of the section is |
| Option A: | 250mm |
| Option B: | 200 mm |
| Option C: | 300 mm |
| Option D: | 350 mm |
|  |  |
| 1.8 | A beam of cross section of 200mm \*450mm and is subjected to bending moment of 135 kNm. If M20 concrete and Fe250 steel are used, beam should be designed as ………. |
| Option A: | Singly reinforced beam |
| Option B: | Doubly reinforced beam |
| Option C: | Singly as well as doubly reinforced beam |
| Option D: | Singly reinforced beam with more steel |
|  |  |
| 1.9 | An isolated T beam has an effective span of 4800 mm and flange width of 800 mm. the flange thickness is 130 mm and the rib is 300 mm wide. The effective flange width is  |
| Option A: | 1000mm |
| Option B: | 780 mm |
| Option C: | 350 mm |
| Option D: | 450 mm |
|  |  |
| 1.10 | For a T beam, if main reinforcement of slab must be  |
| Option A: |  parallel to beam,  |
| Option B: | Perpendicular to beam |
| Option C: | Inclined to axis of beam at 30 degrees |
| Option D: | Partly parallel partly perpendicular |
|  |  |
| 1.11 | A simply supported beam has 350mm width and 500 mm effective depth. The beam subjected to a factored shear force of 62.5 kN. The nominal shear stress in Mpa is |
| Option A: | 0.15 |
| Option B: | 0.35 |
| Option C: | 0.50 |
| Option D: | 0.75 |
|  |  |
| 1.12 | A beam 300 mm\* 600 mm is subjected to factored bending moment of 115 kNm and factored torsion 45 kNm. The equivalent bending moment is  |
| Option A: | 194.41 kNm. |
| Option B: | 102.54 kNm |
| Option C: | 322.12 kNm |
| Option D: | 112.95kNm |
|  |  |
| 1.13 | A beam 300 mm\* 600 mm is subjected to factored shear force 95 kN and factored torsion 45 kNm. The equivalent ultimate shear is  |
| Option A: | 100 kN |
| Option B: | 235 kN |
| Option C: | 335 kN |
| Option D: | 475 kN |
|  |  |
| 1.14 | What is the max spacing of stirrups for a beam of effective depth 600 mm. mm |
| Option A: | 100 mm |
| Option B: | 150 mm |
| Option C: | 200 mm |
| Option D: | 450 mm |
|  |  |
| 1.15 | The load on footing is 1650kN inclusive of its own weight. If safe bearing capacity of soil is 100 kN per sq. meter. The diameter of circular footing are |
| Option A: | 4.58 m |
| Option B: | 5.12 m |
| Option C: | 8.19 m |
| Option D: | 1.1 m |
|  |  |
| 1.16 | What is shear resisted by a bent up bar of 16 mm diameter of Fe415 steel. |
| Option A: | 72.21 kN |
| Option B: | 51.06 kN |
| Option C: | 87.81 kN |
| Option D: | 100.23 kN |
|  |  |
| 1.17 | Depths of different beams are given. Which of these beams needs side face reinforcement. |
| Option A: | 350 mm |
| Option B: | 450 mm |
| Option C: | 950 mm |
| Option D: | 600 mm |
|  |  |
| 1.18 | For a one way slab the area of main reinforcement required is 300 mm. find spacing (centre to centre distance) for 8 mm bar. |
| Option A: | 250 mm |
| Option B: | 125 mm |
| Option C: | 166 mm |
| Option D: | 400 mm |
|  |  |
| 1.19 | For deflection control of slab, the basic span to effective depth ratio for cantilever slab is |
| Option A: | 7 |
| Option B: | 20 |
| Option C: | 26 |
| Option D: | 40 |
|  |  |
| 1.20 | In case of one way slab, the main reinforcement is  |
| Option A: | Along shorter span |
| Option B: | Along longer span |
| Option C: | Along both shorter and longer spans |
| Option D: | At corners only |
|  |  |
| 1.21 | The depth of slab is 250 mm. the Fe 415 distribution steel is provided. Area of distribution steel in sq mm is |
| Option A: | 300  |
| Option B: | 400 |
| Option C: | 150 |
| Option D: | 100 |
|  |  |
| 1.22 | If for Columns with helical reinforcement, if the requirement for ratio of the volume of helical reinforcement to the volume of the core is satisfied then Load Carrying capacity of column is increased by …… percent compared to similar column with lateral tie. |
| Option A: |  5  |
| Option B: |  4 |
| Option C: | 6 |
| Option D: | 7 |
|  |  |
| 1.23 | A RCC short column is 400mm\*400 mm is carrying a factored load of 1800 kN. If M20 concrete and Fe 415 steel are used, the area of steel required in sq. mm is |
| Option A: | 1287 |
| Option B: | 869 |
| Option C: | 1926  |
| Option D: | 2541 |
|  |  |
| 1.24 | A RCC short column is 400mm\*425 mm is carrying a load of 1195kN. If M20 concrete and Fe 415 steel are used, the area of steel required in sq. mm is |
| Option A: | 1287 |
| Option B: | 869 |
| Option C: | 1560  |
| Option D: | 2541 |
|  |  |
| 1.25 | The load on footing is 1650kN inclusive of its own weight. If safe bearing capacity of soil is 150 kN per sq. meter. The dimensions of square footing are |
| Option A: | 3.32m\*3.32m |
| Option B: | 2.42m \*2.52 m |
| Option C: | 1.43m\*1.43m |
| Option D: | 2.81m\*2.81m |
|  | **MODULE 2 STAIRCASE** |
| 2.1 | The pitch of stair should never exceed |
| Option A: | 20˚ |
| Option B: | 25˚ |
| Option C: | 30˚ |
| Option D: | 40˚ |
|  |  |
| 2.2 | A series of steps without any platform, break or landing in their direction, is called |
| Option A: | Riser |
| Option B: | Tread |
| Option C: | Flight |
| Option D: | Nosing |
|  |  |
| 2.3 | Live load on stairs not subjected to overcrowding is…….kN/m2 |
| Option A: | 1.5 |
| Option B: | 6 |
| Option C: | 3 |
| Option D: | 5 |
|  |  |
| 2.4 | Landing is provided in stairs for  |
| Option A: | Increasing length of stair |
| Option B: | To make staircase economical |
| Option C: | For comfort of users |
| Option D: | To reduce load  |
|  |  |
| 2.5 | For dog legged stair case floor to floor height is 3.2 m, rise: 160 mm , tread:250mm , depth of waist slab: 200 mm, L.L = 3 kN/Sq.m, F.F= 1 kN/Sq.m, total working load on stair case is about |
| Option A: | 18 kN/m² |
| Option B: | 12 kN/m² |
| Option C: | 16 kN/m² |
| Option D: | 20 kN/m² |
|  |  |
| 2.6 | Choose correct value of tread and width of staircase for residential building. |
| Option A: | 250mm and 600 mm |
| Option B: | 250 mm and 1200 mm |
| Option C: | 350mm and 700 mm |
| Option D: |  150 mm and 1000mm |
|  |  |
| 2.7 | Live loads on stairs for dwelling houses liable to overcrawding shall be  |
| Option A: | 2 kN/m² |
| Option B: | 2.5 kN/m² |
| Option C: | 3 kN/m² |
| Option D: | 5 kN/m² |
|  |  |
|  | **MODULE 3 RETAINING WALL** |
| 3.1 | The safe bearing capacity of soil is 120kN/m2 , unit weight of soil is 18kN/m3 and angle of repose is 300 degrees. Minimum depth of foundation as per Rankine’s formula is  |
| Option A: | 0.25 m |
| Option B: | 0.50 m |
| Option C: | 0.74 m |
| Option D: | 1.00 m |
|  |  |
| 3.2 | Cantilever retaining walls can safely be used for a height not more than |
| Option A: | 3m |
| Option B: | 4m |
| Option C: | 5m |
| Option D: | 6m |
|  |  |
| 3.3 | Which one of the following is the correct statement about retaining wall |
| Option A: | Toe slab and heel slab are provided at top face |
| Option B: | Toe slab and heel slab are provided with reinforcement at bottom face |
| Option C: | Toe slab is provided reinforcement at top face and heel slab at bottom face |
| Option D: | Toe slab is provided with reinforcement at bottom face and heel slab at top face |
|  |  |
| 3.4 | Weep holes provided into retaining wall for the purpose of |
| Option A: | To provide drainage |
| Option B: | To prevent cracks  |
| Option C: | To avoid friction behind the wall |
| Option D: | To improve appearance |
|  |  |
| 3.5 | The shear key is provided to |
| Option A: | Avoid sliding failure of the wall |
| Option B: | Improve appearance |
| Option C: |  Increase passive resistance |
| Option D: | To resist overturning |
|  |  |
| 3.6 | Weight of a retaining wall is 200 kN, coefficeient of friction is 0.65, horizontal soil pressure force per metre run of wall is 100 kN. The factor of safety against sliding is  |
| Option A: | 1.3 |
| Option B: | 1.97 |
| Option C: | 1.74 |
| Option D: | 2.21 |
|  |  |
| 3.7 | The safe bearing capacity of soil is 120kN/m2 , unit weight of soil is 18kN/m3 and angle of repose is 300 degrees. Minimum depth of foundation as per Rankine’s formula is  |
| Option A: | 0.25 m |
| Option B: | 0.50 m |
| Option C: | 0.74 m |
| Option D: | 1.00 m |
|  |  |
| 3.8 | Weight of a retaining wall is 142 kN, coefficeient of friction is 0.6, horizontal soil pressure force per metre run of wall is 54 kN. The factor of safety against sliding is |
| Option A: | 1.58 |
| Option B: | 2.16 |
| Option C: | 3.18 |
| Option D: | 1.21 |
|  |  |
| 3.9 | In counterfort retaining walls the upright slab  |
| Option A: | Acts like cantilever |
| Option B: | Like fixed beam |
| Option C: | As a continuous slab |
| Option D: | Simply supported beam |
|  |  |
| 3.10 | To have pressure wholly compressive under the base of a retaining wall of width b, the resultant of the weight of the wall and the pressure exerted by the retained, earth should have eccentricity not more than |
| Option A: | b/3 |
| Option B: | b/6 |
| Option C: | b/4 |
| Option D: | b/8 |
|  |  |
| 3.11 | Cantilever retaining walls can safely be used for a height not more than |
| Option A: | 3m |
| Option B: | 4m |
| Option C: | 5m |
| Option D: | 6m |
|  |  |
| 3.12 | Total pressure on the vertical face of a retaining wall of height h acts parallel to free surface and from the base at a distance of |
| Option A: | h/4 |
| Option B: | 2h/3 |
| Option C: | h/3 |
| Option D: | h/2 |
|  |  |
| 3.13 |  |
| Option A: |  |
| Option B: |  |
| Option C: |  |
| Option D: |  |
|  |  |
| 3.14 | The heel slab of a retaining wall is subjected to factored bending moment of 229 kNm. If effective depth of slab is 490 mm, the area of steel required is …… mm2. (use M20 concrete and Fe 415 steel) |
| Option A: | 1521 |
| Option B: | 1834 |
| Option C: | 1372 |
| Option D: | 2738 |
|  | **Module 4 WATER LANK** |
| 4.1 |  In case of the circular water tank with flexible base, due to internal water pressure the wall is subjected to hoop force equal to ……..(ϒ= sp. weight of water, H= depth D= diameter of tank) |
| Option A: | ϒ H (D /2) |
| Option B: | ϒ H |
| Option C: | ϒ H2 |
| Option D: | ϒ D |
|  |  |
| 4.2 | Haunch reinforcement is provided in circular tanks at corners to avoid |
| Option A: | Moment |
| Option B: | Couple |
| Option C: | Absolute pressure |
| Option D: | Bursting pressure |
|  |  |
| 4.3 | A movement joint which allows the adjoining parts of a structure to slide relative to each other with minimum restraint is known as |
| Option A: | Sliding joint |
| Option B: | Expansion joint |
| Option C: | Contraction joint |
| Option D: | Construction joints |
|  |  |
| 4.4 | What will be the hoop force if unit weight of water=ϒ=9.81KN/m3 , height of tank=H= 5m, Diameter of circular tank= D= 10m. |
| Option A: | 123.97 Kn |
| Option B: | 382.54 Kn |
| Option C: | 242.25 kN |
| Option D: | 84.21 Kn |
|  |  |
| 4.5 | A rectangular water tank is resting on ground. If pull in wall at a level is 58860 N, the area of steel required to resist pull is…… mm2 . ( Use Fe415 steel) |
| Option A: | 392  |
| Option B: | 492 |
| Option C: | 183 |
| Option D: | 256 |
|  |  |
| 4.6 | Wall of a circular water tank with flexible base is 265 mm thick. The vertical distribution steel required is…… mm2 . |
| Option A: | 125 |
| Option B: | 418 |
| Option C: | 795 |
| Option D: | 129  |
|  |  |
| 4.7 | If front counterfort are not provided then toe slab is designed as  |
| Option A: |  Cantilever slab |
| Option B: | Simply supported slab |
| Option C: | Fixed slab |
| Option D: | Continuous slab |
|  |  |
| 4.8 | A rectangular water tank is resting on ground. If pull in wall at a level is 38160 N, the area of steel required to resist pull is…… mm2 . ( Use Fe415 steel) |
| Option A: | 392  |
| Option B: | 255 |
| Option C: | 183 |
| Option D: | 256 |
|  |  |
| 4.9 | For a water tank of size 4m\*9m, the longer wall is designed as  |
| Option A: | Vertical cantilevers |
| Option B: | Walls fixed at both ends |
| Option C: | Horizontal cantilevers |
| Option D: | Walls simply supported at ends. |
|  |  |
| 4.10 | If front counterfort are provided then toe slab is designed as  |
| Option A: |  Cantilever slab |
| Option B: | Simply supported slab |
| Option C: | Fixed slab |
| Option D: | Continuous slab |
|  |  |
| 4.11 | What will be the hoop force if unit weight of water=ϒ=9.81KN/m3 , height of tank=H=4m, Diameter of circular tank= D= 8m. |
| Option A: |  23.75 kN |
| Option B: |  156.96 KN |
| Option C: | 57.48 kN |
| Option D: | 78.48 KN |
|  |  |
| 4.12 | Net load on heel slab is |
| Option A: | Downward load |
| Option B: | Upward load |
| Option C: | Horizontal load |
| Option D: | Vertically upward load |
|  |  |
| 4.13 | The circular water tank with rigid base, the upper portion of wall near top is having predominantly |
| Option A: | Simply supported action |
| Option B: | Cantilever action |
| Option C: | hoop action |
| Option D: | Sliding action |
|  |  |
| 4.14 | The circular water tank with rigid base, the lower portion of wall near base is having predominantly |
| Option A: | Simply supported action |
| Option B: | Cantilever action |
| Option C: | Bending action |
| Option D: | Sliding action |
|  |  |
| 4.15 | For circular water tank capacity of tank 800m3, depth of water tank is limited to H=5m, then what will be the diameter of circular water tank? |
| Option A: | 14.27m |
| Option B: | 203.71m |
| Option C: | 28.54m |
| Option D: | 7.85m |
|  |  |
| 4.16 | Heel slab of a counterfort retaining wall is designed as |
| Option A: | Continuous horizontal slab |
| Option B: | Continuous vertical slab |
| Option C: | Simply supported slab |
| Option D: | Fixed slab |
|  |  |
| 4.17 | A water tank wall is subjected to a hoop tension of 132788 N. Find spacing of 12 mm bars to resist this tension.(MS bars) |
| Option A: | 95 |
| Option B: | 134 |
| Option C: | 45 |
| Option D: | 252 |
|  |  |
| 4.18 | In IS code approximate method table for shear force coefficients, for design of water tank |
| Option A: | Positive sign for shear shows inward shear |
| Option B: | Positive sign shows out word shear |
| Option C: | Positive sign shows out downwords shear |
| Option D: | Negative sign shows inward shear |
|  |  |
| 4.19 | Circular water for smaller capacities are not preferred as |
| Option A: | They do not look good |
| Option B: | The cost of formwork offsets the saving of materials |
| Option C: | Circular tanks are structurally inefficient |
| Option D: | Rectangular tanks are water tight  |
|  |  |
| 4.20 | For design of elevated water tank the bending moment due to horizontal thrust is taken as….. P=lateral force, y= vertical distance from hinge. |
| Option A: | Py/4 |
| Option B: | Py/3 |
| Option C: | Py/6 |
| Option D: | Py/12 |
|  |  |
| 4.21 | To avoid cracks in concrete |
| Option A: | A high permissible tensile stress is adopted in steel. |
| Option B: | A low permissible tensile stress is adopted in steel |
| Option C: | Concrete is allowed to reach its max permissible tensile stress. |
| Option D: | High factor of safety against cracking is kept high compared to factor of safety required for structural safety. |
|  |  |
|  | MODULE 5 EARTHQUAKE RESISTANT DESIGN OF STRUCTURES |
| 5.1 | Which of the following statements best describes the state of earthquake prediction? |
| Option A: | scientists can accurately predict the time and location of almost all earthquakes |
| Option B: | scientists can accurately predict the time and location of about 50% of all earthquakes |
| Option C: | scientists can accurately predict the time and location of about 50% of all earthquakes |
| Option D: | scientists can characterize the seismic risk of an area, but can not yet accurately predict most earthquakes |
|  |  |
| 5.2 | State which statement is correct. |
| Option A: | Most earthquakes occur at plate boundaries |
| Option B: | The time and location of most major earthquakes can be predicted several days in advance |
| Option C: | Earthquakes are caused by heavy winds  |
| Option D: | S waves travel faster than both S waves and Surface waves |
|  |  |
| 5.3 | New Zealand is an example of |
| Option A: | Convergent plate boundary  |
| Option B: | Divergent plate boundary  |
| Option C: | Conservative plate boundary  |
| Option D: | Both convergent and conservative plate boundaries  |
|  |  |
| 5.4 | Mercalli indices of VI or lower measure the effects of an earthquake on people  |
| Option A: | cows  |
| Option B: | horses  |
| Option C: | people  |
| Option D: | Buildings |
|  |  |
| 5.5 |  Mercalli indices of VII or higher measure the effects of an earthquake on  |
| Option A: | cows  |
| Option B: | horses  |
| Option C: | people  |
| Option D: | Buildings |
|  |  |
| 5.6 | Surface along which the block of rock slip is called \_\_\_\_\_?  |
| Option A: |  Fault zone |
| Option B: |  Fault Plane  |
| Option C: |  Fault scarp  |
| Option D: |  None of these |
|  |  |
| 5.7 | On a seismic record, the S-P time interval is the \_\_\_\_\_\_\_\_ in arrival time between the P- and S waves.  |
| Option A: | DELAY |
| Option B: | Twice the delay |
| Option C: | Four times the delay |
| Option D: | Five times the delay |
|  |  |
| 5.8 |  Given three differently located seismic stations, the time-travel graph can be used to determine the position of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Option A: | Epicentre |
| Option B: | Radius of earth |
| Option C: | Elasticity |
| Option D: | Mass of earth |
|  |  |
| 5.9 | From the S-P interval a seismologists can determine the \_\_\_\_\_\_\_\_\_ to an earthquake.  |
| Option A: | Distance |
| Option B: | Earthquake force |
| Option C: | Mass of earth |
| Option D: | Elasticity |
|  |  |
| 5.10 | While considering the design of R.C. buildings for providing ductility, IS codes prohibit the steel grade greater than  |
| Option A: | Fe 250 |
| Option B: | Fe 320 |
| Option C: | Fe 415 |
| Option D: | Fe 550 |
|  |  |
| 5.11 | The beds which have a gentle upstream dip will be\_\_\_\_\_\_\_ to the resultant force (R), hence can provides the best resistance to withstand the stresses or loads acting in the area  |
| Option A: |  Parallel  |
| Option B: |  Perpendicular  |
| Option C: |  Inclined at 30 |
| Option D: | Inclined at 45 |
|  |  |
| 5.12 | Now India is divided into \_\_\_\_\_\_\_\_\_\_\_\_ seismic zones.  |
| Option A: | 1 |
| Option B: | 2 |
| Option C: | 3 |
| Option D: | 4 |
|  |  |
| 5.13 | During an eathquke which of following may be generated |
| Option A: | Draught |
| Option B: | Tsunami |
| Option C: | Heavy rains |
| Option D: | Low temperatures |
|  |  |
| 5.14 | Which of the following is not depends on shear strength of the material?  |
| Option A: |  Cohesion |
| Option B: |  Internal friction  |
| Option C: | Normal stress |
| Option D: |  Mass of the material |
|  |  |
| 5.15 | As rupture along a fault initiates, waves of energy travel outward from the hypocenter in a:  |
|  |  |
| Option A: |  linear fashion,  |
| Option B: |  linear fashion |
| Option C: |  a spherical fashion,  |
| Option D: |  none of the above  |
|  |  |
| 5.16 | At a seismic station the first waves to arrive are |
| Option A: | P Wave |
| Option B: | S Wave |
| Option C: | Surface wave |
| Option D: | Love wave |
|  |  |
|  |  |
| 5.17 | At a seismic station the last waves to arrive are |
| Option A: | P Wave |
| Option B: | S Wave |
| Option C: | Surface wave |
| Option D: | Love wave |
|  |  |
| 5.18 | Love waves displace Earth material.  |
| Option A: | in a horizontal \_\_\_\_\_\_\_\_\_\_\_\_ motion |
| Option B: | a skier moving down a mountain hill,  |
| Option C: | a car traveling through the sand dunes, |
| Option D: |  a whale gliding along the ocean's surface |
|  |  |
| 5.19 | \_\_\_\_\_\_\_\_\_\_\_ waves are the most destructive to buildings.  |
| Option A: | P Wave |
| Option B: | S Wave |
| Option C: | Surface wave |
| Option D: | P and S wave similar |
|  |  |
| 5.20 | Each unit increase in magnitude on the Richter scale corresponds to an increase in seismic activity. |
| Option A: | 10 |
| Option B: | 100 |
| Option C: | 50 |
| Option D: | 25 |
|  |  |
| 5.21 | Great earthquakes, on average, occur  |
| Option A: | 30,000 times annually  |
| Option B: | 500 times annually  |
| Option C: | 20 times annually  |
| Option D: | once every 5 to 10 years  |
|  |  |
| 5.22 | The modified Mercalli scale varies from \_\_\_\_ to \_\_\_\_\_.  |
| Option A: | I to XII |
| Option B: | I to X |
| Option C: | I to VII |
| Option D: | I to IV |
|  |  |
|  | **MODULE 6 PRESTRESSED CONCRETE** |
|  |  |
| 6.1 | A post tensioned beam has span of 25m. If the slip at the jacking end is 4 mm, and E=210 kN/mm2 , the percentage loss of stress due to this cause is  |
| Option A: | 12.2 N/mm2 |
| Option B: | 33.6 N/mm2 |
| Option C: | 18.3 N/mm2 |
| Option D: | 54.7 N/mm2 |
|  |  |
| 6.2 | When the prestressing cable is passing through upper kern point |
| Option A: | the stress at the lower fibre of the beam is zero. |
| Option B: | the stress at the lower kern point is zero. |
| Option C: | the stress at the centroidal axis is zero |
| Option D: | the stress at the top fibre of the beam is zero. |
|  |  |
| 6.3 | The concept of load balancing is useful in selecting? |
| Option A: | Anchorage profile |
| Option B: | Shaft profile |
| Option C: | Tendon profile |
| Option D: | Span profile |
|  |  |
| 6.4 | A prestressed concrete beam is loaded with two point loads .The profile of the cable is laid based on the load balancing concept, the shape of profile is  |
| Option A: | Parabolic |
| Option B: | Triangular |
| Option C: | Trapezoid |
| Option D: | Circular  |
|  |   |
| 6.5 | From the following which steel grade is recommended as tendons for post tensioned concrete girder.  |
| Option A: | Fe 250  |
| Option B: | Fe 415  |
| Option C: | Fe 275  |
| Option D: | Fe 1500  |
|  |  |
| 6.6 | The pressure line is also known as \_\_\_\_\_\_\_\_\_\_ |
| Option A: | C line |
| Option B: | E line |
| Option C: | G line |
| Option D: |  I line |
|  |  |
| 6.7 | If in a post tensioned beam the age of concrete at prestress transfer is 7 days. If E=210 kN/mm2 , the loss in prestress due to residual shrinkage strain is |
| Option A: | 44 N/mm2 |
| Option B: | 8 N/mm2 |
| Option C: | 23 N/mm2 |
| Option D: | 32 N/mm2 |
|  |  |
| 6.8 | The change in the external moments in the elastic range of prestressed concrete beam results in  |
| Option A: | Bending moment in pressure line |
| Option B: | Torsion in pressure line |
| Option C: | Flexure in pressure line |
| Option D: | Shift of the pressure line |
|  |  |
| 6.9 | The method of prestressing the concrete after it attains its strength is known as  |
| Option A: | Pre tensioning |
| Option B: | Post tensioning |
| Option C: | Chemical prestressing |
| Option D: | Axial prestressing |
|  |  |
| 6.10 | From the following which concrete grade is recommended for posttensioned concrete girder. |
| Option A: | M 20  |
| Option B: | M 40  |
| Option C: | M 15  |
| Option D: | M 25  |
|  |  |
| 6.11 | The frictional and anchorage slip losses are observed in  |
| Option A: | Post tensioned members |
| Option B: | Pre tensioned members |
| Option C: | Ruptured members |
| Option D: | Axial member |
|  |  |
| 6.12 | In which method the prestress is developed due to the bond between the concrete and steel?  |
| Option A: | Pre tensioning |
| Option B: | Post tensioning |
| Option C: | Thermo electric prestressing |
| Option D: | Prefix beam prestressing |
|  |  |
| 6.13 | A rectangular prestressed concrete beam 400mm\*600mm is subjected to BM of 72kNm. If the axial prestreesing force is 960 kN, the extreme fibre stresses in N/mm2are  |
| Option A: | 7 N/mm2 and 1 N/mm2  |
| Option B: | 4 N/mm2 and 5 N/mm2  |
| Option C: | 4 N/mm2 and 9 N/mm2  |
| Option D: | 5 N/mm2 and 1 N/mm2  |
|  |  |
| 6.14 | The tendons in the pretensioning system are tensioned between |
| Option A: | Rigid anchorages |
| Option B: | Hydraulic jacks |
| Option C: | Concrete beds |
| Option D: | Variable beams |
|  |  |
| 6.15 | Which is one of the systems used for pretensioning |
| Option A: | Magnel-Balton system |
| Option B: | Freyssinet system |
| Option C: | Gifford-Udall system |
| Option D: | Hoyer’s long line method |
|  |  |