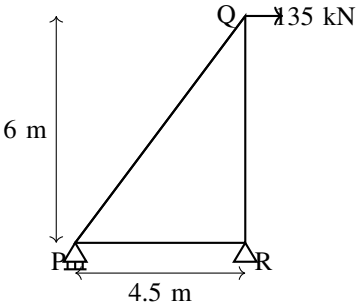
08-27-2021-shift-2(1-15)

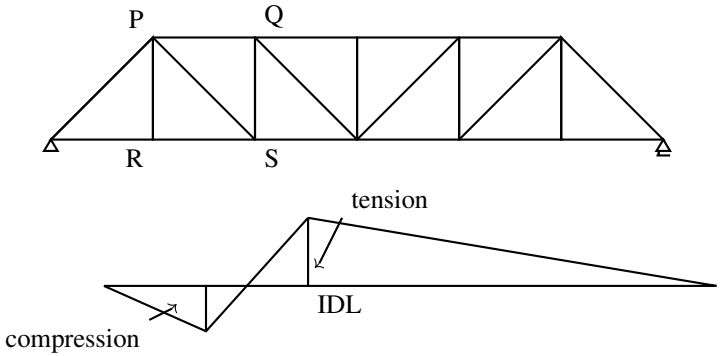
EE24BTECH11055 - Sai Akhila Reddy Turpu

35) The right triangular truss is made of members having equal cross-sectional area of 1550mm^2 and Young's modulus of 2×10^5 MPa. The horizontal deflection of joint Q is



a) 2.47 mm b) 10.25 mm c) 14.31 mm d) 15.68 mm

36) The influence line diagram(ILD) shown is for the member



a) PS b) RS c) PQ d) QS

37) Consider the following statements:
I. The compressive strength of concrete decreases with increase in water-cement ratio of the concrete mix.
II. Water is added to the concrete mix for hydration of cement and workability.
III. Creep and shrinkage of concrete are independent of the water-cement ratio in the concrete mix.
The **TRUE** statements are:

a) I and II b) I, II and III c) II and III d) only II

38) The percentage loss of prestress due to anchorage slip of 3 mm in a concrete beam of length 30 m which is post-tensioned by a tendon with an initial stress of $1200N/mm^2$ and modulus of elasticity equal to $2.1X10^5N/mm^2$ is:

a) 0.0175 b) 0.175 c) 1.75 d) 17.5

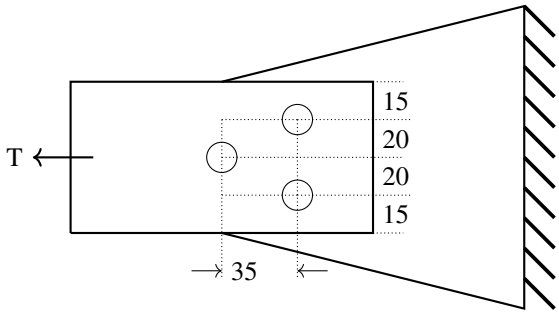
39) A concrete beam of rectangular cross-section of size 120 mm (width) and 200 mm (depth) is prestressed by a straight tendon to an effective force of 150 kN at an eccentricity of 20 mm (below the centroidal axis in the depth direction). The stresses at the top and bottom fibres of the section are:

a) $2.5N/mm^2$(compression), $10N/mm^2$(compression)
b) $10N/mm^2$(tension), $2.5N/mm^2$(compression)
c) $3.75N/mm^2$(tension), $3.75N/mm^2$(compression)
d) $2.75N/mm^2$(compression), $3.75N/mm^2$(compression)

40) Consider the following statements:
I. Modulus of elasticity of concrete increases with increase in compressive strength of concrete.
II. Brittleness of concrete increases with decrease in compressive strength of concrete.
III. Shear strength of concrete increases with increase in compressive strength of concrete.
The **TRUE** statements are:

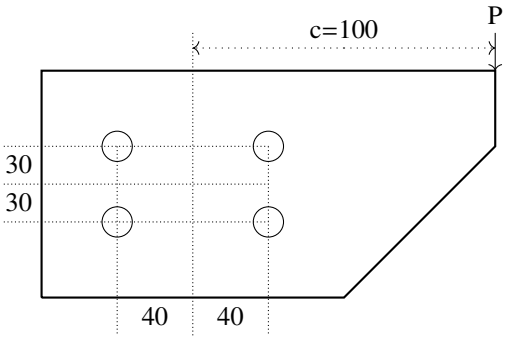
a) II and III b) I, II and III c) I and II d) I and III

41) A steel flat of rectangular section of size 70×6 mm is connected to a gusset plate by three bolts each having a shear capacity of 15 kN in holes having diameter 11.5 mm. If the allowable tensile stress in the flat is 150 MPa, the maximum tension that can be applied to the flat is:



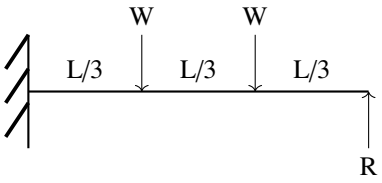
a) 42.3 kN b) 52.65 kN c) 59.5 kN d) 63.0 kN

42) A bracket connection is made with four bolts of 10 mm diameter and supports a load of 10 kN at an eccentricity of 100 mm. The maximum force to be resisted by any bolt will be:



a) 5 kN b) 6.5 kN c) 6.8 kN d) 7.16 kN

43) The plastic collapse load W_p for the propped cantilever supporting two point loads as shown in figure in terms of plastic moment capacity, M_p, is given by:



a) $3M_p/L$ c) $5M_p/L$
b) $4M_p/L$ d) $6M_p/L$

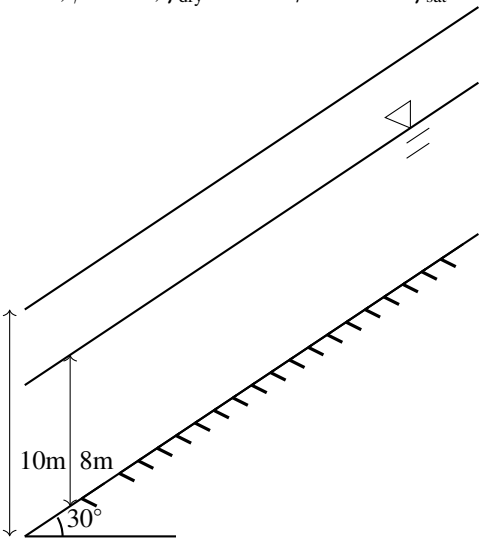
44) Sieve analysis on a dry soil sample of mass 1000 g showed that 980 g and 270 g of soil pass through 4.75 mm and 0.075 mm sieve, respectively. The liquid limit and plastic limits of the soil fraction passing through 425μ sieves are 40% and 18%, respectively. The soil may be classified as:

a) SC b) MI c) CI d) SM

45) The water content of a saturated soil and the specific gravity of soil solids were found to be 30% and 2.70 respectively. Assuming the unit weight of water to be $10kN/m^3$, the saturated unit weight(kN/m^3) and the void ratio of the soil are:

a) $19.4, 0.81$ b) $18.5, 0.30$ c) $19.4, 0.45$ d) $18.5, 0.45$

46) The factor of safety of an infinite soil slope shown in the figure having the properties $c = 0, \phi = 35°, \gamma_{dry} = 16kN/mm^3$ and $\gamma_{sat} = 20kN/m^3$ is approximately equal to:



a) 0.70
b) 0.80
c) 1.00
d) 1.20

47) Match the following groups.

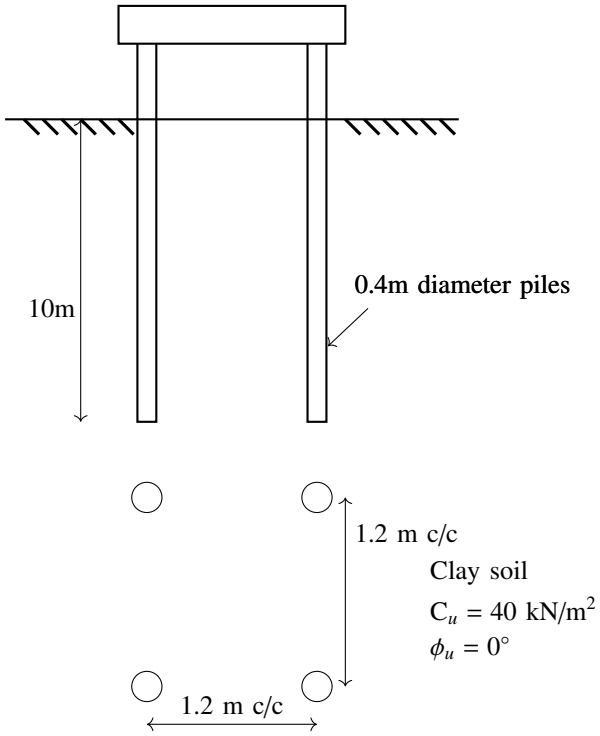
Group-I	**Group-II**
P. Constant head permeability test	1. Pile foundations
Q. Consolidation test	2. Specific gravity
R. Pycnometer test	3. Clay soil
S. Negative skin friction	4. Sand

a) P-4, Q-3, R=2, S=1
b) P-4, Q-2, R=3, S=1
c) P-3, Q-4, R=2, S=1
d) P-4, Q-1, R=2, S=3

48) The bearing capacity of a rectangular footing of plan dimensions 1.5 m X 3 m resting on the surface of a sand deposit was estimated as $600kN/m^2$ when the water table is far below the base of the footing. The bearing capacities in kN/m^2 when the water level rises to depths of 3 m, 1.5 m and 0.5 m below the base of the footing are:

a) $600, 600, 400$ b) $600, 450, 350$ c) $600, 500, 250$ d) $600, 400, 250$

49) What is the ultimate capacity in kN of the pile group shown in the figure assuming the group to fail as a single block?



a) 921.6 b) 1177.6 c) 2438.6 d) 3481.6

50) A horizontal water jet with a velocity of 10 m/s and cross sectional area of 10mm^2 strikes a flat plate held normal to the flow direction. The density of water is 1000kg/m^3. The total force on the plate due to the jet is

a) 100 N b) 10 N c) 1 N d) 0.1 N

51) A 1 : 50 scale model of a spillway is to be tested in the laboratory. The discharge in the prototype is $1000m^3/s$. The discharge to be maintained in the model test is:

a) $0.057m^3/s$ b) $0.08m^3/s$ c) $0.57m^3/s$ d) $5.7m^3/s$