Registration No : | | | | | | | | | | |

Total Number of Pages : 02 **B.Tech.**
PECI5412

8th Semester Regular / Back Examination 2017-18
ADVANCED FOUNDATION ENGINEERING
BRANCH : CIVIL
Time : 3 Hours
Max Marks : 70
Q.CODE : C294

Answer Question No.1 which is compulsory and any five from the rest.
Assume suitable data wherever necessary
The figures in the right hand margin indicate marks.

Q1. **Answer the following questions :** **(2 x 10)**

a) Define: 'frequency ratio', 'magnification factor', 'damping ratio' and 'natural frequency'.

b) Explain the 'coefficient of elastic uniform shear'.

c) Show the nature of variation of deflection and moment of an anchored sheet pile wall by fixed earth support method.

d) What do you mean by partial floating foundation? Discuss its necessity.

e) Discuss a cantilever sheet pile with sketch.

f) What do you mean by expansive soil? Discuss with an example.

g) What is floating foundation? Give examples.

h) What is the use of a lime column?

i) What do you mean by bottom elastic heave? When it occurs?

j) What do you obtain from a bender element test?

Q2. **a)** What are various types of machine foundations used for different kinds of machinery? Give neat sketches. **(5)**

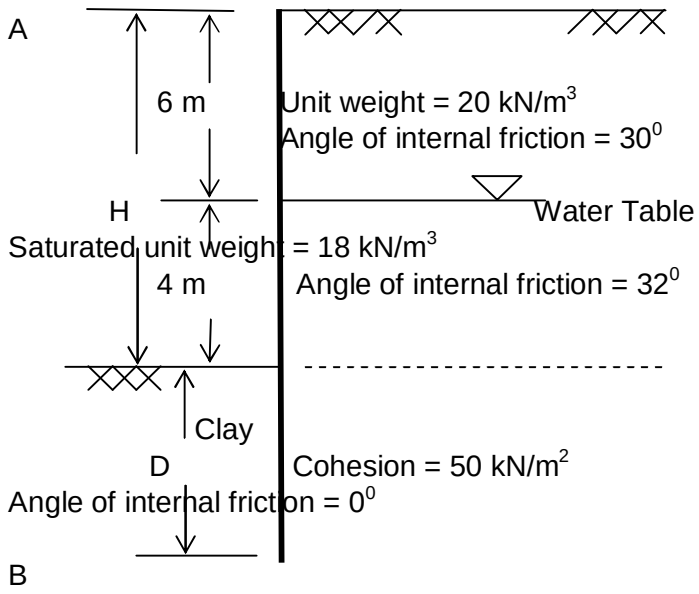
b) Discuss the Indian Standard code of practice for design of foundations for reciprocating type machines. **(5)**

Q3. **a)** The resonant frequency of a block is observed as 18 Hz. The amplitude at resonance is 1.20 mm. The dynamic force exerted at18 Hz is 5 kN. If the weight of the block is 20 kN, what is the damping factor? **(5)**

b) Enumerate basic dynamic properties of a soil. How do you assess the Poisson's ratio of a soil for both drained and undrained conditions? What is dynamic shear modulus? How do you calculate it from a stress controlled cyclic tri-axial test? **(5)**

Q4. Compute the embedment length D for the sheet pile wall AB shown in Figure 1. **(10)**

Figure 1



Q5. **a)** A 5 m deep and 2 m wide vertical cut is made for a strip foundation in plastic clay having unit weight of 19 kN/m^3 and un-drained shear strength of 20 kN/m^2. What is the factor of safety of the cut against heave at the bottom of the cut? **(5)**

b) Discuss the difference between 'partial floating' and 'full floating' foundations. What is a buoyancy raft? **(5)**

Q6. **a)** Discuss the laboratory test to determine the free swell. What is swelling pressure? How do you obtain it in the laboratory? **(5)**

b) Discuss various structural solutions to problems in design of foundations in expansive soils. **(5)**

Q7. **a)** For a cantilever sheet piling penetrating sand soils, lay down the step by step procedure for obtaining the pressure diagram. **(5)**

b) Explain in brief the dilato meter test. How do you correlate various dynamic soil properties from this test results. **(5)**

Q8. **Write short notes on any TWO :** **(5 x 2)**

a) Pressure meter Test

b) Barken's method

c) Lime columns

d) Equivalent beam method