SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

BE - SEMESTER–VI• MID SEMESTER EXAMINATION – SUMMER 2015

SUBJECT: ADVANCED CONSTRUCTION TECHNOLOGY (160601)

DATE: 10/03/2015 TIME: 2:00pm TO 3:15pm TOTAL MARKS: 30

Instructions:
1. All the questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable data if required.

Q.1 (a) Compare Cast in situ piles and Precast piles (two points) [02]
(b) Describe box caissons, giving neat sketch. In which situations box caissons are adopted? [04]
(c) What are the measures employed to prevent leakage in cofferdam? [04]

Q.2 (a) What factors are to be considered while deciding the pile spacing? [02]
(b) Define a cofferdam. What are the purposes of constructing a cofferdam? [03]
(c) Explain (with fig.) the method of formation: (a) Raymond piles (b) Button bottom piles (c) Precast concrete piles. [05]

OR

Q.2 (a) Explain the design features of cofferdam. [03]
(b) Explain the dynamic formulae adopted for determining load carrying capacity of pile. [03]
(c) What are monoliths? Describe its construction procedure, giving detailed sketch. What are its advantages, disadvantages & uses? [04]

Q.3 (a) Explain pile load test for finding bearing capacity of pile. [05]
(b) What are the factors affecting the selection of a particular types of a cofferdam? [05]

OR

Q.3 (a) What is pneumatic caisson? Where is it adopted? Describe the procedure for sinking, giving advantages and disadvantages. [05]
(b) Describe the method of constructing (a) Single wall cofferdam (b) Double wall cofferdam [05]

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BE - SEMESTER–VI• MID SEMESTER EXAMINATION – SUMMER 2015

SUBJECT: APPLIED FLUID MECHANICS(160602)

DATE: 09-03-2015 TIME:2:00 pm to 3:15 pm TOTAL MARKS:30

Instructions: 1. All the questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable data if required.

Q.1 (a) Describe the various forces acting on fluid in motion. [04]
(b) Explain Euler’s equation of motion. [03]
(c) Derive the geometrical conditions for the most economical section of a rectangular channel. [03]

Q.2 (a) An oil of viscosity 2 poise and specific gravity 0.85 is flowing through a circular pipe of diameter 25 cm at a rate of 12 litres/s. Calculate (i) pressure drop in a length of 550 m and (ii) shear stress at the pipe wall. [04]
(b) Enlist different types of dimensionless numbers and models. [03]
(c) What do you mean by dimensional analysis? [03]

OR

Q.2 (a) A trapezoidal channel has side slopes of 1 horizontal to 2 vertical and the slope of the bed is 1 in 1500. The area of the section is 50 sq.mt. Find the optimum dimensions of the channel. Also determine discharge if C=50. [04]
(b) As per dimensional analysis derive the formula for the following properties-
   (i) Dynamic Viscosity
   (ii) Critical Depth
   (iii) Surface Tension
   (c) Define initial and boundary conditions. [03]

Q.3 (a) Explain Buckingham’s \( \pi \)-Theorem. [05]
(b) Oil of specific gravity 0.82 is pumped through a horizontal pipe line 25 cm in diameter and 4 km long at the rate of 900 litre per minute. The pump has an efficiency of 68% and requires 7.35 kw to pump the oil. Determine the dynamic viscosity of oil and verify whether flow is laminar. [05]
Q.3  
(a) Explain viscous flow through circular pipe. Derive the equation of maximum shear stress.
(b) The pressure difference $\Delta P$ in a pipe due to viscous flow depends on the diameter of the pipe $D$, length of pipe $l$, velocity of flow $v$, dynamic viscosity $\mu$ and density $\rho$. Obtain an expression for $\Delta P$ by performing dimensional analysis.
SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

BE - SEMESTER–VI • MID SEMESTER EXAMINATION – SUMMER 2015

SUBJECT: Railway Bridge & Tunnel Engineering (160603)

DATE: 11/3/2015 TIME: 02.00 pm to 3:15 pm TOTAL MARKS: 30

Instructions: 1. All the questions are compulsory.
               2. Figures to the right indicate full marks.
               3. Assume suitable data if required.

Q.1 (a) State different types of surveys conducted before fixing railway alignment. Explain any two. [10]

(b) What do you understand by loading gauge? How is it different from the construction gauge?

Q.2 (a) Define creep of rail and state the effects of creep [10]

(b) Define the followings:
     Ruling gradient (b) Pusher gradient (c) Momentum gradient (d) track modulus

OR

Q.2 (a) Explain resistance due to friction and due to wave action that a locomotive in motion has to overcome. [10]

(b) A four degree curve diverges from a main curve of 5 degree in an opposite direction in the layout of a broad gauge yard. If the speed on the main curves restricted to 55.63kmph, determine the speed restriction on the branch line. Assume permissible cant deficiency as 7.5 cms

Q.3 (a) Briefly explain different types of gradients used in railway. What is grade compensation? Compute the same for horizontal curve of 3⁰ on B.G. track having ruling gradient of 1:200. [10]

(b) Explain equilibrium cant and cant deficiency

OR

Q.3 (a) Define & describe in detail: economic span, linear waterway, afflux, [10]

Compare the characteristics of wooden sleepers and reinforced concrete sleepers used on Indian Railways

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SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

BE - SEMESTER–VI • MID SEMESTER EXAMINATION – SUMMER 2015

SUBJECT: Earthquake Engineering (160605)

DATE: 13-03-2015 TIME: 02:00 pm to 03:15 pm TOTAL MARKS: 30

Instructions: 1. All the questions are compulsory.
2. Figures to the right indicate full marks.
3. Assume suitable data if required.

Q.1 (a) Calculate base shear for the school in Delhi with following data by static coefficient method. (a) No. of storey = 9 (b) No. of bay in x direction = 5 No. of bay in y direction = 5 (d) storey height = 4.0 m (e) Width of each bay = 5 m (f) Size of beam = 300 x 450 mm (g) size of column = 600 (X-dir) x 300 (Y-dir) mm (h) LL = 4 kN/m2 (i) Thickness of slab = 150 mm (j) thickness of wall : 230 mm (k) Type of soil = Soft soil Assume suitable data if required. Write all your assumptions & clauses of IS 1893 (2002). [10]

Q.2 Answer the following.
(a) Derive the equation of motion for free un-damped SDOF system. [5]
(b) Explain mathematical modelling in detail. Draw mathematical model for any two structural system. [5]
OR
Q.2 Answer the following.
(a) Differentiate between magnitude and intensity of an earthquake. [5]
(b) Explain different seismic waves. [5]

Q.3 Answer the following.
(a) Explain Seismic design philosophy for buildings. [5]
(b) Derive the equation of motion for free damped SDOF system. [5]
OR
Q.3 Answer the following.
(a) Distinguish between (i) centre of mass and centre of stiffness (ii) Flexible diaphragm and rigid diaphragm [5]
(b) A spring mass model consists of 5kg mass and spring with stiffness 3.5 N/mm, was tested for viscous damped vibration. Test recorded two successive amplitude 1.5 and 1.25. Determine the natural frequency of undamped system, the logarithmic decrement, Damping ratio, Damping co-efficient. [5]
SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY
BE - SEMESTER-VI • MID SEMESTER EXAMINATION – SUMMER 2015
SUBJECT: Geotechnical Engineering-II (160606)

DATE: 14-03-2015 TIME: 02:00 pm to 03:15 pm TOTAL MARKS:30

Instructions: 1. All the questions are compulsory.
               2. Figures to the right indicate full marks.
               3. Assume suitable data if required.

Q.1  (a) Write down equation for critical depth $H_c$ for steady seepage along the slope for cohesive soil? (Marks-2) [10]

(b) Discuss planar failure surface Culmann’s method and derive equation for safe height of slope. (Marks-4)

(c) A 12 m high embankment is inclined on sides at angle of 35° to the horizontal. If the shear strength parameters of the soil are given as $c = 15kN/m^2$ and $\Phi=22^\circ$, find the factor of safety available against slope failure. The unit weight of the soil is equal to 18kN/m$^3$. Stability number $(S_n) = 0.025$. (Marks-4)

Q.2  (a) Discuss the assumptions in the Rankine’s theory of earth pressure. (Marks-4) [10]

(b) Explain of lateral earth pressure in detail with diagram. (Marks-4)

(c) Write down equation of co-efficient of active earth pressure $k_a$ and passive earth pressure $k_p$. (Marks-2)

OR

Q.2  (a) Discuss types of slope failure in detail with sketches. (Marks-2) [10]

(b) Write down difference between Caisson and Cofferdam. (Marks-4)

(c) List out Well Components and their function in details. (Marks-4)

OR

Q.3  (a) Derive an expression for the vertical stress at a point due to a point load, using Boussinesq’s theory. (Marks-5)

(b) Explain in detail about the factors affecting the selection of type of foundation. (Marks-5)

OR

Q.3  (a) Differentiate between General shear failure and Local shear failure. (Marks-5) [10]

(b) Define Bearing Capacity, Gross Bearing Capacity $(q)$, Net Bearing Capacity $(q_n)$, Ultimate Bearing Capacity $(q_u)$, Net Ultimate Bearing Capacity $(q_{nu})$. (Marks-5)