

8E4031	Roll No. _____	Total No of Pages: 4
<p style="font-size: 18pt; font-weight: bold;">8E4031</p> <p style="font-size: 14pt; font-weight: bold;">B. Tech. VIII Sem. (Main/Back) Exam., April, 2015</p> <p style="font-size: 14pt; font-weight: bold;">Civil Engineering</p> <p style="font-size: 14pt; font-weight: bold;">8CE1 Geotechnical Engineering - II</p>		

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. Graph Paper Centimeter _____

2. NIL _____

UNIT – I

- Q.1 (a) Derive an expression for determination of vertical stress under a uniformly loaded circular area. [8]
- (b) The uniform intensity of loading at the foundation level of a building. 20 m in width and very great extent in length is estimated to be 10 t/m^2 . A 5 m thick clay layer exists at a depth of 10m below the foundation. Find the average increase in vertical pressure at the clay layer under the centre line and edge of the building. [8]

OR

- Q.1 (a) What is the basis of construction of Newmark's influence chart? How is it used? [8]

- (b) A 2000 kg point load acts on the surface of an elastic medium of very great extent. What are the intensities of vertical pressure due to the load at 5, 25 and 50m directly below the load? Find the vertical pressures also at points 5m and 25m deep but 10m horizontally away from the vertical axis of the load. [8]

UNIT – II

- Q.2 (a) Explain logarithm of time method for determination of coefficient of consolidation. [6]
- (b) Subsoil strata at a site consist of a stratum of silty sand 6m thick overlying a stratum of coarse sand of same thickness. Under the coarse sand stratum lies a deposit of clay 14m thick with rock at bottom. Water table that is originally at 2m depth is lowered by drainage to a depth of 6m. For silty sand, $G = 2.64$, $e = 0.72$, for coarse sand, $G = 2.68$, $e = 0.68$, for clay $G = 2.72$, $e = 0.92$, compression index (C_c) = 0.38. Water content of soil above water table is 25%. Calculate consolidation settlement of clay layer due to lowering of water table. [10]

OR

- Q.2 (a) Give a few causes of pre – consolidation of soils. [4]
- (b) List and discuss assumptions in Terzaghi's theory of one – dimensional consolidation. Derive the basic differential equation of consolidation. Also give Terzaghi's graphical solution for the differential equation for a set of boundary conditions. [12]

UNIT – III

- Q.3 (a) What are various causes of failure of slopes? [4]
- (b) Describe friction circle method of analyzing stability of finite slopes. Also discuss the modifications in the method during sudden drawdown. [12]

OR

- Q.3 (a) How would you decide the depth and lateral extent of exploration? Give two empirical guidelines that enable the determination of depth of exploration. [4]
- (b) Explain with a neat sketch the stationary piston sampler for recovering samples from subsurface. [4]
- (c) What are various types of samples that could be recovered from subsoil? Explain various factors causing disturbance of sample. [8]

UNIT – IV

- Q.4 (a) A retaining wall with a smooth vertical back has to retain a backfill of $c - \phi$ soil up to 5m above ground surface. The surface of backfill is horizontal and it has following properties: [12]

$$\phi = 12^\circ, c = 1.5 \text{ t/m}^2, \gamma = 1.8 \text{ t/m}^3$$

- (i) Plot the distribution of active earth pressure on the wall.
 - (ii) Determine the magnitude and point of application of active thrust.
 - (iii) Determine the depth of the zone of tension cracks.
 - (iv) Determine the intensity of a fictitious uniform surcharge, which, if placed over the backfill can prevent the formation of tension cracks.
- (b) Draw Mohr circles for Rankine's active and passive states of plastic equilibrium showing directions of failure planes. [4]

OR

- Q.4 (a) Define earth pressure. What do you understand by active, at rest and passive earth pressure? Give examples. [6]

- (b) A retaining wall retains dry sand to a depth of 8m. The backfill soil has the following properties: $c = 0$, $\phi = 32^\circ$, $\gamma = 17.5 \text{ kN/m}^3$. The angle of wall friction (δ) = 10° . The back of retaining wall is inclined at a positive batter angle of 15° . If the surface of the backfill slopes upwards at a surcharge angle of 15° , calculate the total active thrust per unit length of the wall and its line of action using Rebhann's graphical construction. [10]

UNIT – V

- Q.5 (a) How would you interpret for net loading intensity for a given permissible settlement in case of sands from the results of plate load test? [4]
- (b) What is the effect of rise of water table on bearing capacity of footings resting on sands and clays? [4]
- (c) A square footing $1.2\text{m} \times 1.2\text{m}$, rests at a depth of 1m in a saturated clay layer 4m deep. The clay is normally consolidated having an unconfined compressive strength of 40 kN/m^2 . The soil has the following properties.
Liquid limit = 30%, water content = 28%, $\gamma_{\text{sat}} = 17.8 \text{ kN/m}^3$, $G = 2.68$. Using Terzaghi's equation, determine net safe bearing capacity. Compute the settlement that would result if this load intensity were allowed to act on the footing. Natural water tables is quite close to the ground surface. [8]

OR

- Q.5 (a) How would you estimate allowable bearing pressure of a footing resting on sand using SPT – value as per IS code? [6]
- (b) What are relative advantages and disadvantages of well foundations over the pile foundations? [6]
- (c) What are the criteria for satisfactory action of machine foundations? [4]

8E4033

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Total No of Pages: **2****8E4033**

B. Tech. VIII Sem. (Main/Back) Exam., April, 2015
Civil Engineering
8CE3 Project Planning & Construction Management

Time: 3 Hours**Maximum Marks: 80****Min. Passing Marks: 24****Instructions to Candidates:**

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1. NIL _____2. NIL _____**UNIT – I**

Q.1 Describe the importance of proper planning of a construction project. Also explain Capital Budgeting. [16]

OR

Q.1 Discuss the objectives and functions of construction project management. [16]

UNIT – II

Q.2 Differentiate PERT and CPM. Also discuss the various types of floats associated with the activities of project. [16]

OR

Q.2 A PERT project consists of the following activities and their time estimates in days (optimistic, most likely and pessimistic) are given in the table. Draw the project network and find the expected completion time of project. Also find the probability that project will be completed. [16]

- (i) At least 4 days earlier than expected time.
 (ii) Not more than 4 days later than expected time.

Activity	1-2	1-3	1-4	2-5	3-5	4-6	5-6
t_o	1	1	2	1	2	2	3
t_m	1	4	2	1	5	5	6
t_p	7	7	8	1	14	8	15

UNIT – III

Q.3 Differentiate between resource smoothing and resource leveling. Explain also resource allocation. [16]

OR

Q.3 Discuss the cost control measures adopted in construction projects. [16]

UNIT – IV

Q.4 Discuss various types of tenders giving suitability merits and demerits of each. [16]

OR

Q.4 What is contract? Explain and four types of contracts. [16]

UNIT – V

Q.5 Discuss safety and its importance in construction project management. [16]

OR

Q.5 Define Environmental Impact Assessment of Construction Projects? [16]

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8E4032

B. Tech. VIII Sem. (Main/Back) Exam., April, 2015

Civil Engineering

8CE2 Water Resources Engineering - II

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1. NIL

2. NIL

UNIT – I

Q.1 (a) Describe the necessity of providing a canal fall. What are the factor to be considered while deciding the location of a fall? [8]

(b) What are the factors to be considered for selecting suitable type of cross drainage works? [8]

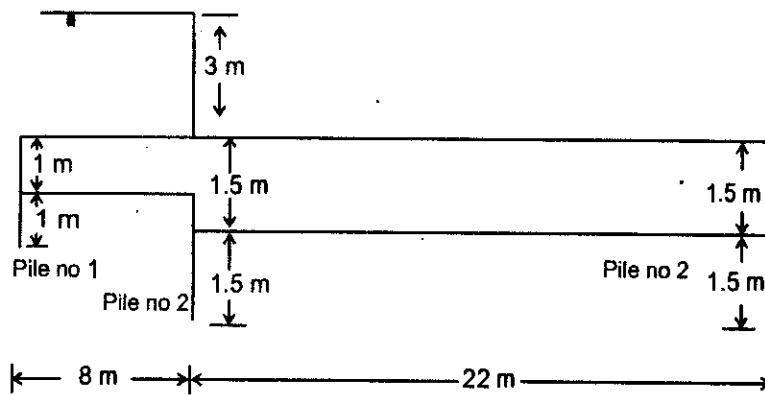
OR

Q.1 (a) Draw the sketch and explain the design of various components of a Sarda type fall. [8]

(b) Describe the points to be considered for selecting the site of a cross drainage work. [8]

UNIT – II

Q.2 (a)



Calculate uplift pressures at key points of all the three piles of the structure shown above. Also check the thickness provided and the exit gradient. The safe exit gradient is 1.5 [12]

(b) Compare the Bligh's and Khosla's theories. [4]

OR

Q.2 Design a vertical drop weir using Bligh's theory and check the exit gradient and the thickness of floor by Khosla's theory for the given data.

- (i) Design flood discharge = $4000 \text{ m}^3/\text{s}$
- (ii) H. F. L. before construction = 200.00
- (iii) F. S. L. of canal = 199.00
- (iv) Average bed level of river = 192.00
- (v) Retrogression of bed = 0.50m
- (vi) Lacey's silt factor = 1.0
- (vii) Safe exit gradient = $1/5$
- (viii) Coefficient of creep = 11
- (ix) D/S bed level = 192.00
- (x) Afflux = 1.0m

Draw the sketch of vertical drop weir showing all the components.

[16]

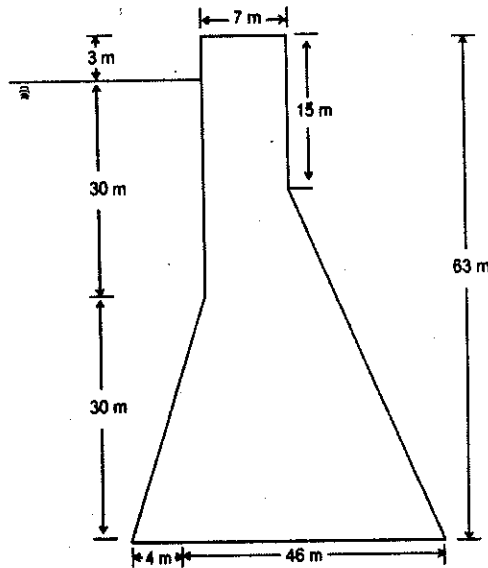
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UNIT - III

Q.3 (a)

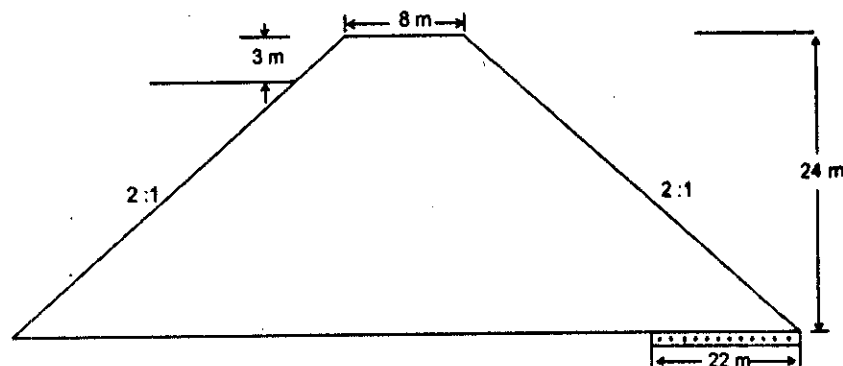


Check the stability of the gravity dam shown above for the reservoir empty and reservoir full conditions. Calculate the principal stresses and shear stress at toe and heel of the dam. Consider only self weight, weight of water, water pressure and uplift pressures. Average shear strength (q) = 1.4 MPa and $W_c = 24 \text{ KN/m}^3$. [12]

(b) Describe the phenomenon of piping in earth dam and its prevention methods [4]

OR

Q.3 (a) Check the stability of u/s and d/s slopes of the given earth dam. Assume The saturated unit weight = 21 KN/m^3 and unit weight under steady seepage = 20 KN/m^3 , the $\phi = 25^\circ$ and under $C = 20 \text{ KN/m}^2$ and $\delta = 60^\circ$



The areas of rectangle plotted are, $a_N = 13.0 \text{ cm}^2$, $a_T = 6.6 \text{ cm}^2$ and $a_u = 3.0 \text{ cm}^2$, with scale $1 \text{ cm} = 5 \text{ m}$ for downstream side, $a_N = 14.0 \text{ cm}^2$ $a_T = 4.2 \text{ cm}^2$ for upstream side with same scale. The radius r of the slip circle = 75 cm in both cases. [8]

- (b) Briefly describe the forces acting on a gravity dam. [8]

UNIT – IV

- Q.4 (a) What are the essential requirements of a spillway? Describe the factors affecting required spillway capacity. [8]
- (b) Draw and explain the general features of a hydro electric scheme. [8]

OR

- Q.4 (a) Sketch and describe different type of spillways. [8]
- (b) Describe the function of a draft tube. Explain cavitations. [8]

UNIT – V

- Q.5 (a) Describe briefly environmental impact assessment of water resource projects. [8]
- (b) Describe water shed management. [8]

OR

- Q.5 Write short notes on the following. [4×4=16]

- (i) Reservoir Sedimentation
- (ii) Use of computer aided designs in irrigation projects.
- (iii) Optimization techniques.
- (iv) G. I. S in water resources engineering

8E4036

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Total No of Pages: **4****8E4036****B. Tech. VIII Sem. (Main/Back) Exam., April, 2015****Civil Engineering****8CE4.3 Advance Transportation Engineering****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 24***Instructions to Candidates:*

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. Graph Paper _____2. NIL _____**UNIT – I**

Q.1 (a) What are the objectives and various methods of conducting origin- destination survey? How the O-D survey data is presented? Explain with the help of sketches. [8]

(b) Discuss in detail causes and preventive measures to reduce accidents on Indian roads. [8]

OR

Q.1 (a) Twenty five spot speed observation were taken and were as under: [8]
50, 40, 60, 54, 45, 31, 72, 58, 43, 52, 46, 56, 43, 65, 33, 69, 34, 51, 47, 41, 62, 43, 55, 40, 49

Calculate-

- (i) Time mean speed (ii) Space mean speed,
and verify the relation between two.

- (b) Discuss comparative merits and demerits of on-street and off- street parking. Enumerate various types of on- street parking with neat sketches. [8]

UNIT – II

- Q.2 (a) What do you understand by “Linear Regression and Correlation”. Discuss with an example. [6]
- (b) Following table shows the speed class and number of vehicles. Find out relative and cumulative frequency and draw curves for both the cases. [10]

Speed class (kmph)	No. of vehicles
0-10	55
10-20	35
20-30	134
30-40	197
40-50	220
50-60	222
60-70	179
70-80	58

OR

- Q.2 (a) In analyzing the employment structure of households in an urban area, in connection with a trip generation study it has been found that there are 2500 households of 4 members in each. Find the probability that a particular household of this size has 0, 1, 2, 3 and 4 employed residents. [8]
- (b) The speed and concentration of vehicles in traffic stream were observed and the following data are obtained-

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Concentration (veh/ km.)	5	10	15	20	25	30	35	40	45	50
Speed KPH	72	68	61	52	47	39	32	27	20	13

Find the regression equation for determining the speed from concentration. [8]

UNIT – III

- Q.3 (a) Why are traffic signals needed? Compare advantages and disadvantages of fixed time, vehicle actuated and semi-vehicle actuated signals. [6]
- (b) A fixed time two phase signal is to be provided at an intersection having four arms. The design hour traffic and saturation hour flow are as under: [10]

	North	South	East	West
Design hour flow	800	400	750	600
Saturation flow	2400	2000	3000	3000

The time lost per phase due to starting delay is 2secs. Calculate the optimum cycle time. Allocate green times to the two phases.

OR

- Q.3 (a) Describe the physical, mental and psychological characteristics of human which are important as a road user. [8]
- (b) Why are the various parameters to be considered in designing a rotary intersection? Discuss the advantages and disadvantages of rotary intersection. [8]

UNIT – IV

- Q.4 (a) How does the road marking help in control of traffic? Give different type of road markings and explain their object in brief and also of zebra line markings in detail. [8]

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- (b) Why street lighting is necessary on urban roads? Draw a neat sketch of traffic rotary & highway illumination as per IRC practice. [8]

OR

Q.4 (a) Write in brief about: [4×2½]

- (i) Roadway delineators
- (ii) Speed Brakers
- (iii) Traffic Attenuators
- (iv) Peripheral Parking Schemes

- (b) What are various type of islands used? Explain the uses of each. [6]

UNIT – V

Q.5 (a) What are the various ill-effects of noise pollution on human health? Explain various techniques for control of traffic noise. [8]

- (b) Discuss the importance of road safety audit in reducing accidents on roads. Also write various steps how road safety audit is conducted. [8]

OR

Q.5 (a) What are the major pollutants of the exhaust gases of motor vehicles? Discuss detrimental effects of these pollutants on the environment. [8]

- (b) Enumerate various road safety equipments and discuss how these equipments improve safety on roads. [8]
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