

8E8092

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8E8092**B.Tech. VIII Semester (Main) Examination, April/May 2016****Civil Engineering****8CE2A Design of Steel Structures - 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.

Unit - I

1. Design a gantry girder, without lateral restraint along its span, to be used in an industrial building carrying an overhead travelling crane for the following data:

Span of gantry girder

(Centre to centre distance between columns)=7.5m

Crane capacity =200KN

Self-weight of the crane girder excluding trolley=200KN

Self-weight of trolley, electrical motor, hook, etc=40KN

Minimum hook approach=1.2m

Distance between wheel centres=3.5m

Centre to centre distance between gantry rails =15m

(ie span of the crane)

Self weight of rail section=300N/m

Take steel of grade Fe 410

(16)

OR

1. a) Design purlins for a fink type roof truss taking dead loads and wind loads
Ignore lineload. Use I section
The data is
- i) Span of roof truss=14m
 - ii) Rise of truss=3.5m
 - iii) Spacing of trusses c/c=3.5m
 - iv) Spacing of purlins on principal rafter=1.96m
 - v) Wind load=1450N/m²
 - vi) Deadload from sheets etc=220N/m² (12)
- b) Explain the applications of tabular trusses. Also explain connections in tabular sections. (4)

Unit - II

2. Design a welded plate girder 24m in span and laterally restrained throughout. It has to support a uniform load of 100 KN/m throughout the span exclusive of self weight. Design plate girder using intermediate transverse stiffener. Connections need not be designed, grade of steel using is of Fe 410 (16)

OR

2. a) Discuss the functions of intermediate transverse stiffeners and bearing. Stiffeners in a plate girder (6)
- b) Discuss splicing of web plate in plate girder (5)
- c) Write Design Procedure of a Plate girder. (5)

Unit - III

3. Design a deck type plate girder bridge for single track B.G main line loading, for following data:
- i) Effective span: 24m
 - ii) Spacing of plate girder: 1.9 m c/c
 - iii) Weight of stock rails: 440 N/m
 - iv) Weight of guard rails: 260 N/m
 - v) Weight of fastening etc: 280 N/m of track
 - vi) Size of sleepers (timber): 2.8m×250mm×150mm @0.4mc/c
 - vii) Density of timber=7.4 KN/m³
- Permissible stresses as per Railway steel bridge code (16)

OR

3. a) Draw a neat diagram of general arrangement for deck type plate girder bridge for railways and label their components (5)
- b) What are the IRC recommendations for the design of plate girder bridges (6)
- c) Explain the Overturning effects due to wind load on plate girder bridges for railways (5)

Unit - IV

4. Design a through type truss girder bridge for the following data : (16)
- i) Effective span: 39m
- ii) Centre to centre spacing of stringer: 1.9m
- iii) Sleepers of timber and their spacing: 250mm x 150mm x 2.8m @ 0.4m c/c
- iv) Density of timber : 7.4 KN/m³
- v) Weight of stock rails: 0.44 KN/m
- vi) Weight of guard rails: 0.26 KN/m
- vii) Weight of fastenings etc: 0.28 KN/m of track

OR

4. a) Draw a neat diagram of elevation of truss girder, top & bottom lateral bracings of a through type truss girder bridge (6)
- b) What is the difference between portal bracing and sway bracings used in through type truss girder railway bridges. (10)

Unit - V

5. Design an over head circular steel tank with hemispherical bottom, for capacity 1,80,000 ltrs. It is supported on 8 columns uniformly placed along periphery, for which $M=0.00827WR$ $T=0.00063 WR$ and $F=W/16$ may be taken (16)

OR

5. Design an elevated riveted steel rectangular tank, with flat bottom for a capacity of 75000 liters of water. The tank may be assumed to be supported on 6 numbers of columns (16)

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8E8093**B.Tech. VIII Semester (Main) Examination, May 2016****Civil Engineering****8CE3A 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)

Unit - I

1. a) Define Net present value, benefit -cost ratio, internal rate of return and accounting rate of return related to capital investment proposals (8)
- b) Discuss the main causes of failure of construction projects (8)

OR

1. a) Discuss the objectives of project planning. What are the different stages involved in planning of a construction project (8)
- b) Discuss the objectives and functions of construction project management(8)

Unit - II

2. Discuss the term "project scheduling and its importance in construction projects. Also discuss concept of work - breakdown structure in scheduling of construction projects

Consider a project with the following details. Draw the project network, identify critical path, find the minimum completion time of the project. Also find the total float and free float time for each non-critical activity.

| | | | | | | | | | | | |
|---------------------|---|---|---|---|---|---|---|---|---|-----|-----|
| Activity | A | B | C | D | E | F | G | H | I | J | k |
| Immediate | | | | | | | | | | | |
| Predecessor | - | - | - | A | B | B | C | D | E | H,I | F,G |
| Duration (Weeks) | 2 | 3 | 4 | 6 | 6 | 8 | 5 | 1 | 4 | 6 | 3 |

OR

2. Explain the difference between CPM & PERT Network techniques. 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, find the expected completion time of project. Also find the probability that the project will be completed at least 4 days earlier than expected time (16)

| | | | | | | | | | | |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Activity | 1-2 | 1-3 | 1-4 | 2-6 | 3-6 | 4-5 | 5-6 | 2-7 | 6-8 | 7-8 |
| t_o | 6 | 3 | 5 | 4 | 8 | 4 | 3 | 8 | 7 | 5 |
| t_m | 8 | 7 | 7 | 8 | 10 | 6 | 5 | 10 | 10 | 8 |
| t_p | 11 | 9 | 10 | 14 | 12 | 8 | 6 | 12 | 15 | 12 |

Unit - III

3. Define direct and indirect project costs. The time - cost data fo a project are given below, the project indirect cost is Rs. 60/- per week. (16)

| Activity | Normal | | crash | | cost slope (Rs/Week) |
|----------|--------|------|-------|------|-------------------------|
| | time | cost | time | cost | |
| 1-2 | 8 | 100 | 6 | 200 | 50 |
| 1-3 | 4 | 150 | 2 | 350 | 100 |
| 2-4 | 2 | 50 | 1 | 90 | 40 |
| 2-5 | 10 | 100 | 5 | 400 | 60 |
| 3-4 | 5 | 100 | 1 | 200 | 25 |
| 4-5 | 3 | 80 | 1 | 100 | 10 |

Determine the optimum time duration of the above project and cost associated with this duration, giving step-by step process of crashing of activities. Also draw the cost-duration curve for this network

OR

3. Discuss any **four** of the following
- Time-cost trade off measures adopted in various construction projects
 - Direct, indirect project costs and concept of cost-slope
 - Project network updating
 - Resources allocation
 - Probability of meeting a schedule time in PERT networks (4×4=16)

Unit - IV

4. a) Discuss various types of tenders giving suitability of each (8)
b) Differentiate between (8)
i) Earnest money deposit(EMD) and security deposit
ii) Item rate contract and Lump sum contract

OR

4. a) Define a Turn - Key contract and discuss essential features of a contract documents (8)
b) Define arbitration and its advantages mention reasons for determination of a contract. (8)

Unit - V

5. a) Discuss the important aspects of safety programs at construction sites. What are the major causes of accidents at construction sites (10)
b) Define environmental impact assessment of construction projects (6)

OR

5. a) Discuss the various environmental and social issues related to construction projects (8)
b) Discuss project management information system(PMIS) mentioning its need, framework and functions (8)

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B.Tech. VIII Semester (Main/Back) Examination, May 2016
Civil Engineering
8CE4.2A Advance Foundation 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. IS-6403 2. IS 8009 Part I 3. IS 1904

Unit - I

1. Determine net safe bearing capacity for a foundation of size 2m×3m, resting at a depth of 1.5m on a soil having $C=50 \text{ kN/m}^2$, $\phi=25^\circ$, & $\gamma =18 \text{ kN/m}^3$. Assuming general shear failure using IS6403 method.
- i) Assuming water table at greater depth
- ii) Water table at the depth of 1.5m (16)

OR

1. a) Determine net safe bearing capacity of a foundation of size 2m×4m, resting at a depth of 2.0m on a saturated clay, having $c_u =150 \text{ kN/m}^2$ & $\gamma_{\text{sat}} =20 \text{ kN/m}^3$, using Skempton's analysis (8)
- b) Explain the criteria of deciding depth of shallow foundation (8)

Unit - II

2. a) Explain schmertmann's method of determination of settlement of footing resting on cohesionless soil (10)

- b) Determine settlement of a footing of size $2\text{m} \times 4\text{m}$ applied with a loading intensity of 150 kN/m^2 , resting in granular soil. Use SPT value $N=20$ Use IS 8009 part I (6)

OR

2. a) Determine consolidation settlement of a footing of size $2\text{m} \times 4\text{m}$ resting at a depth of 1.5m in saturated clay, having $c_e=0.13$, $e_0=0.60$, $\gamma_{\text{sat}}=20\text{kN/m}^3$. The loading intensity is 150 kN/m^2 acting on foundation. Also fox's depth correction as per IS 8009 part I (10)
- b) Write a note on differentiate settlement of soil (6)

Unit - III

3. a) A 12m long concrete pile 400mm dia has been driven into a granular soil having $\phi = 32^\circ$, $\gamma = 18\text{kN/m}^3$ & $\gamma_{\text{sat}} = 20\text{kN/m}^3$. Water table is at a depth of 2m below ground surface. Determine safe load carrying capacity of the pile using factor of safety of 3. Take $N_q=42$ (10)
- b) Describe engineering New's formulae of dynamic analysis of piles (6)

OR

3. a) There are 9 piles in a group of square pattern. The spacing between Piles are 500 mm c/c . Piles of 200mm dia & 8m long are used for a foundation resting in clayey soil having $c_u=50\text{kN/m}^2$, $\gamma = 18\text{kN/m}^3$. Calculate safe load carrying capacity of group of piles, with $\text{FOS}=2.5$ & $\alpha = 0.9$ (10)
- b) What do you understand by negative skin friction? How do you calculate it for a group of piles in clay (6)

Unit - IV

4. a) How do you classify expansive soil? (6)
- b) What are the measures to minimize the effect of swelling for shallow foundations (10)

OR

4. a) Determine safe load carrying capacity of double under reamed pile of 400mm dia and 5m length in clayey soil having average cohesion of 70kN/m^2 (8)
- b) Explain the special considerations for designing foundation in sanitary land fills (8)

Unit - V

5. a) What do you understand by fully compensating raft (i.e floating raft) (4)
- b) A raft foundation of size $14\text{m} \times 20\text{m}$ is resting in clay having $c_u = 150\text{kN/m}^2$ and $\gamma = 20\text{kN/m}^3$. A loading of 150kN/m^2 is applied at the base of the raft. Determine the depth at which raft be placed so as to get a factor of safety of 2.5 against shear (12)

OR

5. a) Explain the components of well foundation with suitable diagrams (8)
- b) Explain Tilt and shift in well foundation. How do you check them (8)