1. Which is not the design consideration for an intake?
(a) Selection of a particular type for the given source.
(b) Consideration of the total lift from the source to the treatment plant and selection of a suitable pumping unit.
(c) Determination of the total length of suction and delivery mains, head losses due to friction and small bends, enlargement and reduction.
(d) Installation of intake valves or porthole at 2 or 3 different levels to get the best available quantity of water, eliminating seasonal fluctuation of waster levels.
(e) Providing any size of screen around the intake pipe not to permit entry of large and small objects, such as logs, stones, aquatic lives and vegetation.

5. Which does not cause corrosion in metal pressure pipes?

(a) Biological action
(b) Influence of hydrogenous compounds
(c) Temperature
(d) Velocity of flowing water
(e) Pitting

6. Which is not correct?
(a) Replacing a corroded leaky water main by the roadside is very difficult and costly.
(b) Corrosion greatly reduces the pressure head and results in increases cost of pumping and short life of the water mains.
(c) Leakage in domestic plumbing fixtures due to corrosion involves not only the replacement but also repairing damages to walls, floors, etc.
(d) Rusty water due to corrosion causes strain in cloth after washing, produces unsightly marks on the plumbing fixtures and unsuitable for domestic uses.
(e) Onsite repairing of corroded pipe is impossible.

7. Which action is not controlling measure of corrosion of metal pipe?
(a) Corrosion of metal pipes may be reduced or eliminated by protection coatings of cast iron.
(b) Red lead paint or zinc pigments offer some protection and are used on the exterior or exposed metal pipes.
(c) Other metallic protective coatings are tin coatings, nickel coatings, chromium coatings and copper coatings.
(d) Galvanizing by dipping the pipe molten zinc is an effective corrosion control except for highly acid waters.
(e) Large pipes are usually protected by non-metallic coatings, such as bituminous coatings or cement linings.

8. What is the cause of scale formation in water supply lines
(a) Scale formation in water pipes is due to the presence of dissolved organic matter.
(b) Scale formation in water pipes is mainly due to the presence of dissolved mineral matter and gases under favorable conditions of temperature and pressure.
(c) Scale forms by the natural coagulation process during the flowing of water through the pipe.
(d) Bacteria present in pipe water causes scale formation.
(e) Arsenic, manganese and chloride present in water also causes scaling in water pipe.

9. Intake entrance should lie
(a) 1 to 2 m below the water surface and 1 to 2 m above the river, lake or reservoir floor to keep bottom sediments out of intakes.
(b) 2 to 5 m below the water surface but 2 to 3 m above the river, lake or reservoir floor to keep bottom sediments out of intakes.
(c) 3 to 5 m below the water surface but 1 to 2 m above the river, lake or reservoir floor to keep bottom sediments out of intakes.
(d) 1 to 3 m below the water surface and 1 to 3 m above the river, lake or reservoir floor to keep bottom sediments out of intakes.
(e) 1 to 5 m below the water surface but 2 to 3 m above the river, lake or reservoir floor to keep bottom sediments out of intakes.

10. The entrance velocities are kept down
(a) to 7 to 10 m/sec of such low velocities that vegetation, debris and other materials are not entrained in the flowing water, fish and other aquatic lives are well able to escape from the intake current.
(b) to 2 to 5 m/sec of such low velocities that vegetation, debris and other materials are not entrained in the flowing water, fish and other aquatic lives are well able to escape from the intake current.
(c) to 3.6 to 7 m/sec of such low velocities that vegetation, debris and other materials are not entrained in the flowing water, fish and other aquatic lives are well able to escape from the intake current.
(d) to 7.6 to 10 m/sec of such low velocities that vegetation, debris and other materials are not entrained in the flowing water, fish and other aquatic lives are well able to escape from the intake current.
(e) to 2.6 to 6.6 m/sec of such low velocities that vegetation, debris and other materials are not entrained in the flowing water, fish and other aquatic lives are well able to escape from the intake current.

2. Which is incorrect statement for pressure pipe?
(a) A pressure pipe is also defined as a pipe flowing full.
(b) Such pipes are often less costly than open channels because they can generally follow in full condition.
(c) If water is scare, pressure pipes may be used to avoid loss of water by seepage and evaporation, which generally occurs in open channels.
(d) Pressure pipes are preferable for public water supplies because of the reduced opportunity for pollution.

3. Which is not the desirable quality of pressure pipe?
(a) They should be made of mild steel so that no corrosion develops causing wastage of water.
(b) They should be strong and of sufficient thickness to withstand both internal and external stresses.
(c) The inner surface of the pipe should be very smooth so that the resistance to flow is minimum.
(d) The pipe materials should not impart any physical and chemical effects to water.
(e) The pipe sections should possess good hydraulic properties.

4. Which materials are not generally used for fabrication of pipes for water supply?
(d) Plastic, asphaltic fiber and lead
(a) Steel, cast iron and galvanized iron
(b) Concrete, asbestos cement and vitrified-clay
(e) Corrugated sheet, plain sheet and PET sheet
(c) PVC, copper and wrought iron

## CE 3141 CT-1(2)

1. Which is not objective of water distribution system?
a) To make water available in close proximity to the consumer
d) To supply water with adequate pressure
e) To regulate water supply as per requirement
b) To supply water in adequate quantities according to the demand of the consumers
c) To store water for future use

2. Which is not the purpose of service reservoir?
a) If pumps are used, the provision of these reservoirs makes it possible to run pumps at uniform rate.
d) They maintain constant velocity in the mains. The velocity in mains, without service reservoirs, will fall as the demand of water will increase.
b) In case of gravity system of supply, the provision of these reservoirs will result in mains of smaller diameters.
c) They furnish the facility of storage of water for meeting fluctuating hourly demand of water.
e) They make the design and construction of treatment unit and distribution system economical.

3. What is the recommended fire pressure at the hydrant in residential districts?
d) 65 psi
c) 40 psi
a) 60 psi
e) 55 psi
b) 70 psi

4. What is the minimum pressure in commercial districts?
b) 65 psi
c) 60 psi
e) 55 psi
a) 70 psi
d) 75 psi

5. Which system of distribution layout is suitable to old towns and cities?
b) Interlaced system
e) Circular system
d) Radial system
c) Ring system
a) Tree system

6. Which factors is not considered in the design of a distribution system are –
e) Topographic condition
d) Design period
a) Type of flow
b) Method of distribution
c) Probable future demand

7. What is the velocity of flow is assumed to calculate pipe size
a) 1.5 m/s
b) 1 m/s
c) 2 m/s
d) 1.25 m/s
e) 1.75 m/s

8. Which method is developed based on successive approximation?
e) Approximation method
b) Method of sections
a) Equivalent pipe method
c) Hardy-Cross method
d) Intersection method

9. What is the quality of water having TDS of 450 mg/l?
a) Excellent
e) Unacceptable
b) Good
d) Poor
c) Fair

10. The water is considered moderately hard if hardness varies between
d) 201 to 250 ppm
e) 251 to 300 ppm
b) 56 to 100 ppm
a) 0 to 55 ppm
c) 101 to 200 ppm

## CE 3141 CT-1(3)

1. What is the recommended fire pressure at the hydrant in residential districts?
e) 55 psi
c) 70 psi
b) 60 psi
a) 50 psi
d) 65 psi

2. What is the minimum pressure in commercial districts?
d) 75 psi
a) 70 psi
c) 60 psi
e) 55 psi
b) 65 psi

3. What is the velocity of flow is assumed to calculate pipe size

a) 1.5 m/s
d) 1.25 m/s
b) 1 m/s
e) 1.75 m/s
c) 2 m/s

4. The water is considered moderately hard if hardness varies between

e) 251 to 300 ppm
c) 101 to 200 ppm
d) 201 to 250 ppm
a) 0 to 55 ppm
b) 56 to 100 ppm

5. The entrance velocities are kept down

(d) to 7.6 to 10 m/sec of such low velocities that vegetation, debris and other materials are not entrained in the flowing water, fish and other aquatic lives are well able to escape from the intake current.
(b) to 2 to 5 m/sec of such low velocities that vegetation, debris and other materials are not entrained in the flowing water, fish and other aquatic lives are well able to escape from the intake current.
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(c) to 3.6 to 7 m/sec of such low velocities that vegetation, debris and other materials are not entrained in the flowing water, fish and other aquatic lives are well able to escape from the intake current.
(e) to 2.6 to 6.6 m/sec of such low velocities that vegetation, debris and other materials are not entrained in the flowing water, fish and other aquatic lives are well able to escape from the intake current.

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(a) 1 to 2 m below the water surface and 1 to 2 m above the river, lake or reservoir floor to keep bottom sediments out of intakes.
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(d) 1 to 3 m below the water surface and 1 to 3 m above the river, lake or reservoir floor to keep bottom sediments out of intakes.

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(d) Bacteria present in pipe water causes scale formation.
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(b) Scale formation in water pipes is mainly due to the presence of dissolved mineral matter and gases under favorable conditions of temperature and pressure.
(c) Scale forms by the natural coagulation process during the flowing of water through the pipe.

## CE 3141 CT(2)

**1. What is not the treatment option for water?**

(b) Sedimentation with coagulation
(d) Disinfection
(a) Plain sedimentation
(c) Filtration
(e) Distillation

**2. Which is not the usual coagulant?**

(c) Sodium bicarbonate, $NaH(CO3)$
(a) Aluminium sulphate, $Al2(SO4)3$
(d) Magnesium carbonate, $MgCO3$
(e) Sodium aluminate, $Na2Al2O4$
(b) Ferrous sulphate, $FeSO4$ and lime, $Ca(OH)2$

**3. Which process is not used for iron removal?**
(e) Biological process
(b) Dilution
(a) Aeration
(d) Base Exchange Process
(c) Chemical oxidation

**4. Which process is not used for disinfection?**
(d) Silver treatment
(a) Ozonization
(b) Ultra-violet Rays
(e) Bioremediation
(c) Excess Lime application

**5. The settling velocity of the particle does not depend upon:**
(b) Specific gravity of the particle
(d) Density of water
(a) Vertical flow velocity of water
(c) Viscosity of water
(e) Temperature of water

**6. The coagulation of waters is not depending upon:**
(b) Quantity of coagulant
(a) Kind of coagulant
(e) Time of mixing, flocculation and coagulation.
(d) Characteristics of water (suspended matter, pH and temperature)
(c) Temperature of water

**7. Dosage of Coagulants does not depend:**
(a) Turbidity of water
(d) Time of dosing
(e) Temperature of water
(c) pH value of water
(b) Colour of water

**8. Which action is not involved in filtration?**
(e) Electrolytic changes
(d) Biological metabolism
(c) Sedimentation
(b) Inter particular action
(a) Mechanical straining

**9. Which is not rule for designing under drainage system**
(d) The cross-sectional area of a lateral drain should be about 2 to 4 times the total cross-sectional areas of perforations in it.
(c) The total cross-sectional areas of perforations should be about 0.30% of the total filter area.
(a) The ratio of length of lateral drain to its diameter should not exceed 20.
(b) The cross-sectional area of central drain should be about twice the cross-sectional area of lateral drain.
(e) The perforations in the lateral drain should be of diameter 6 mm to 12 mm.

**10. Which is incorrect for pressure filter?**
(e) They posses poor efficiency in the removal of bacteria and turbidity.
(c) The overall capacity is small.
(b) It is difficult to keep close watch on the performance.
(a) The unit is compact.
(d) It can be recommended for treating large quantity of water.

**CE 3141 (MZA)**

**CT -1** **Time 20 min**

1. Write short notes on - (i) Global warming and (ii) Sustainability. (6)
2. What is the difference between Environmental Science and Environmental Engineering? (4)
3. Predict the population for the years 1981, 1991, 1994, and 2001 from the following census figures of a town by incremental increase method. (10)

| Year | 1901 | 1911 | 1921 | 1931 | 1941 | 1951 | 1961 | 1971 |
|---|---|---|---|---|---|---|---|---|
| Population (Thousands) | 61 | 65 | 63 | 75 | 73 | 85 | 95 | 115 |

1. What is the process by which water enters the small pore spaces between particles in soil or rocks?
    1. transpiration
    2. infiltration
    3. precipitation
    4. sublimation

2. Permeability is .....
    1. the ability of a solid to allow fluids to pass through
    2. the process by which plants release water vapor to the atmosphere
    3. the amount of water vapor in the air relative to the maximum amount of water vapor the air can hold.
    4. the percentage of pore space in the rock

3. The best groundwater reservoirs have _____?

1. low permeability and low porosity
2. low permeability and high porosity
3. high permeability and low porosity
4. high permeability and high porosity

5. Groundwater represents how much of the world's freshwater supply?

1. about 1%
2. about 5%
3. about 20%
4. about 50%

6. What is the difference between the saturated and the unsaturated zones of ground water?

1. the saturated zone has a higher porosity than the unsaturated zone
2. the saturated zone has a lower porosity than the unsaturated zone
3. the pore spaces in the saturated zone are completely full of water; the pore spaces in the unsaturated zone are not completely full of water.
4. the pore spaces in the saturated zone are not completely full of water; the pore spaces in the unsaturated zone are completely full of water

7. A formation that has very low hydraulic conductivity and hardly transmits water is called...

1. Aquifer
2. Cone of depression
3. Aquicludes
4. aquifuge

8. Storage function related to...

1. Porosity
2. Specific yield
3. Both Porosity and Specific yield
4. None of these

9. Most of the fresh groundwater stores within a depth of ..... below the ground surface.

1. 20 m
2. 30 m
3. 40 m
4. 50 m
5. None of these

10. The unit of transmissibility is ...

1. m2/d
2. m3/d/m
3. m/sec
4. m/d11. Specific capacity of a tubewell may be expressed as

1. m3
2. m3/day
3. m3/d/m
4. m2/d/m

4. The average annual rainfall in bangladesh is .....

1. 1000-2200 mm
2. 2200-2800 mm
3. 2800-4000 mm
4. None of these

12. Arsenic in drinking water should be...

0.01 ppm
0.005 ppm
0.1 ppm
0.05 ppm

13. Bored wells are constructed when low yielding groundwater sources are found close to the surface usually under...

1. 10 m
2. 30 m
3. 50 m
4. 100 m

14. The most common drilling method is ...

- Auger
- Jetting
- Rotary
- Cable tool
- None of these

15. Most groundwater withdrawn in the Bangladesh is used for....

- Industry
- Drinking water
- Swimming pools
- Irrigation

16. Where is most of the freshwater found on Earth?

- lakes
- glaciers
- oceans
- rivers

17. The total amount of water on Earth

- is becoming greater
- stays about the same
- is becoming less
- depends on the weather

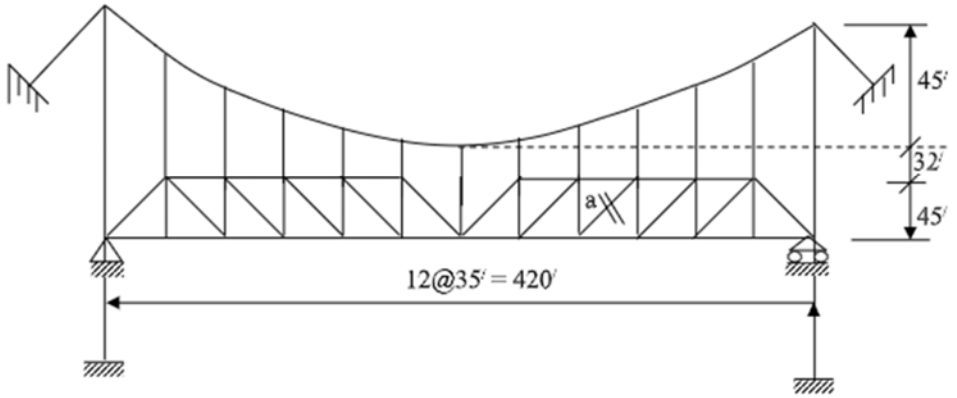
18. Water stored in underground layer

- Aquifers
- Zone of Aeration
- Zone of Saturation
- Groundwater

Class Test on CE 3111 (2nd)

Time: 25 min Full marks 20

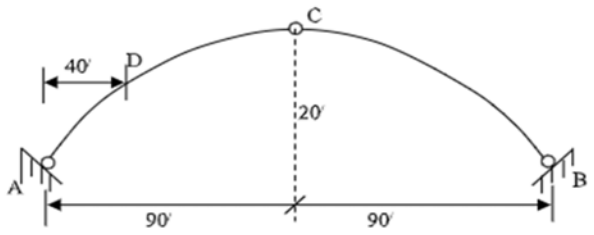
Q.1 Draw influence lines for hanger tension, maximum cable tension and stress in the member 'a' of the following suspension bridge shown in figure. Find the maximum stress in the member 'a' if the bridge is subjected to a uniform load of (5+ 0. 25xLast 3 digit of Roll No). k/ft and a moving concentrated load of (15 + 0.50xLast 3 digit of Roll No) kips.




Class Test on CE 3111

Time: 25 min Full marks 20

Q.1 Draw influence lines for bending moment, shear force, and normal thrust at a section D of the following three hinged parabolic arch. Where L = 180+ 0.50X(Last Three Digit of Roll No., a= 40+ 0.25X(Last Three Digit of Roll) and h= 20 + 0.35 X(Last Three Digit of Roll No) Also obtain the maximum moment and shear at section D due $H_{20}$ loading.




**Time: 20 minutes** **CT -1** **CE 3121** **Total Mark: 20**

Q.1. Define hydraulic jump? When it is occurred? Write down the significant applications of hydraulic jump. **8.0**

Q.2. Determine the type of gradually varied flow profile of a rectangular channel with a bottom width of 5.0 m and a bottom slope of 0.0007 has a discharge of 2.50 $m^3$/sec. In a gradually varied flow in this channel, the depth at a certain location is found to be 0.50 m. Assume, n = 0.016. Also, sketch the qualitative diagram of the identified profile.

**12.0**

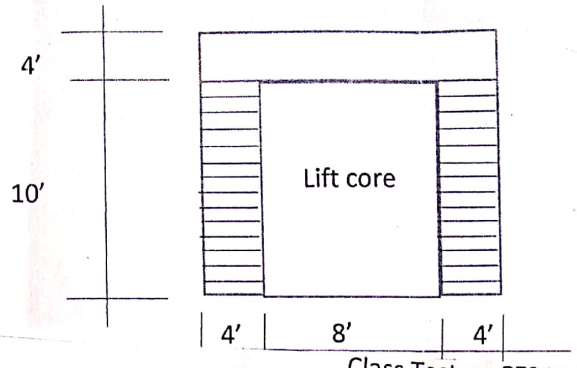
## Class Test on CE 3115

Full Marks:20

Mahfuz 1700097
Cycle: Day: Date: 4.12.21

Time: 25mi

**Q.1** Design the stair case shown in figure below using WSD method.The service live load is 100 psf and 3000 psi concrete is for use with steel with a yield stress equal to 60000 psi; and assume the step 6 inch riser and thread 10 inch.

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E-mail: 1700097@stud.ruet.ac.bd

## Class Test on CE3131

Department of Civil Engineering
Rajshahi University of Engineering & Technology

Full Marks 20 (5+5+10)

Time:15 Mins

Q.1. Write the equation of Brown's stability number.
Q.2. Mention some work sites where the compaction is needed.
Q.3. Briefly explain the principle of soil compaction.

Mahfuz 1700097
Cycle: Day: Date: 6.12.21

## Class Test on CE 3115

F Marks:20

Time: 25min

Q. reinforced concrete slab is built integrally with its supports and consists of two equal spans, each with a clear span of 16 ft. The rvice live load is 100 psf and 4000 psi concrete is specified for use with steel with a yield stress equal to 60000 psi. Design the slab ng USD method.

## CLASS TEST ON CE 3121, ENGINEERING HYDRAULICS TIME: 30mins. Full mark : 20

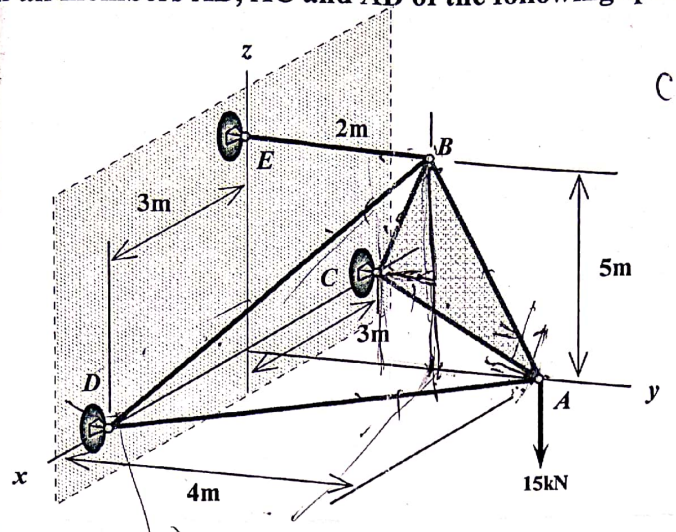
*Q.1(a) Show that at critical state of flow the specific force is a minimum for the given discharge.*
*(b) Derive a relationship between the initial depth and the sequent depth of a hydraulic jump on a horizontal floor in a rectangular channel.*
*(c) Prove that the energy loss in a horizontal hydraulic jump is* $\Delta E=(y_2-y_1)/4\, y_1 y_2$
*(d) Draw specific energy curve.Show crtical depth, alternate depth and Spercritial flow*

**Time: 20 minutes** **CT -2** **CE 3121** **Total Mark: 20**

Q.1. How can you determine the operating point in a centrifugal pump? **8.0**

Q.2. A double acting reciprocating pump has a stroke of 300 mm and a piston of diameter 150 mm. The delivery and suction heads are 26 m and 4 m respectively including friction heads. If the pump is working at 60 rpm, find the power required to drive the pump with 80% efficiency. Take diameter of piston rod are 25 mm. **12.0**

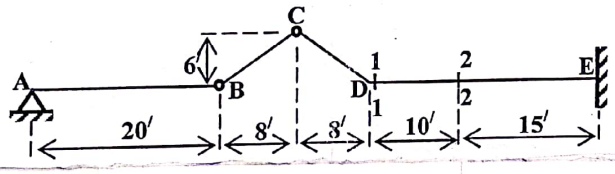
ind forces in all members AB, AC and AD of the following space truss.



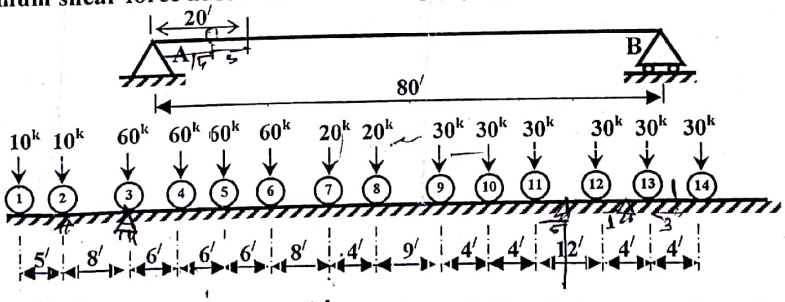

CE 3111
CT-1
TUA

Q.2 **As a unit load moves from A to B and from D to E on the following structure, draw the influence lines for:**

(i) Reaction at support A.
(ii) Reaction in the member BC.
(iii) Shear and moment at 1-1(Just to the right of D).
(iv) Shear and moment at 2-2.

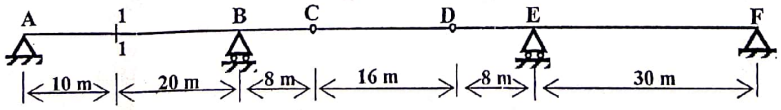



**Q.1 Determine the maximum shear force at section *a* in the simply supported beam due to following as shown below.**




TUA
CE 3111
TUA

**Q.2 Compute the maximum and minimum bending at a section 1-1 of the balance cantilever beam as shown below due to indefinite uniformly distributed load of 0.5 kN/m and a concentrated load of 12 kN.**




**CLASS TEST ON CE 3121, ENGINEERING HYDRAULICS TIME: 30mins. Full mark : 20**

*Q 1(a) Show that the tractive force ratio is a function of inclination of sloping side and of the angle of repose of the materials forming the channel body*

*(b) Show that the best hydraulic trapezoidal section is one half of a hexagon.*

*© A trapezoidal section carrying 400 cfs is built with non erodible bed having a slope of 0.0016 and n=0.025. Design the channel section.*

*(d) Show that in the best hydraulic trapezoidal, the length of the sloping surface of a trapezoidal channel section is half of the width of water surface*

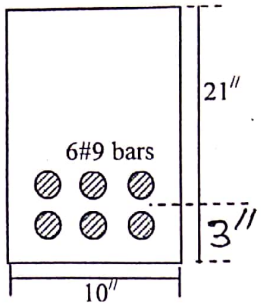
= 2.48 k-ft

Class Test on CE 3115

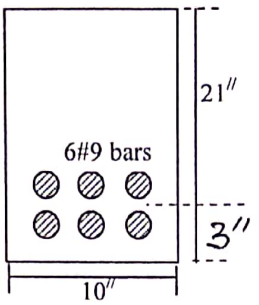
Full Marks 20

Time: 30 Mins

Q.1 Draw the transformed section for the beam section shown in the figure for (i) uncracked and (ii) cracked state. Assume $f_c' = 5000$ psi and $f_y = 60{,}000$ psi. 6




Q.2 Compute the design moment capacity of the beam section shown in figure. Assume $f_c' = 5000$ psi and $f_y = 60{,}000$ psi. 14



# Sessional Quiz/CE 3112/'17 Series

*Required

Email *

Your email address

Write your Full Roll No. *

Your answer

I take the Oath to avoid any unfair means. *

- Yes
- No

A plate girder bridge is to be designed for a span of 60 ft having a width of 25 ft. Calculate number of stringer. (maximum spacing for stringer is 10 ft., and minimum spacing of floor beam is 8 ft.). 2 points

- 1
- 2





Calculate concentrated load on floor beam at exterior point using the given data. [self weight of floor beam = 0.25 klf, concrete slab thickness = 6 inch., spacing of floor beam = 9 ft., spacing of stringer = 6 ft., unit weight of stringer = 0.035 klf]. 4 points

- 4.37 k
- 4.62 k
- 2.09 k
- 2.34 k

Assume pitch of the rivet is 5 times the diameter of rivet hole, depth and thickness of web plate are 40 inch and 0.5 inch, respectively. Calculate effective self weight of web plate. 4 points

- 0.045 k/ft
- 0.054 k/ft
- 0.017 k/ft
- 0.071 k/ft





- 3
- 4

Find maximum (-)ve live load moment for stringer using the following data. [Truck load = H20, spacing of floor beam = 9 ft., spacing of stringer = 16 ft.] 3 points

- 40.40 k-ft
- 35.40 k-ft
- 76.91 k-ft
- 82.34 k-ft

Find maximum (+)ve live load moment for stringer using the following data. [Truck load = H20, spacing of floor beam = 9 ft., spacing of stringer = 16 ft.] 3 points

- 40.40 k-ft
- 35.40 k-ft
- 76.91 k-ft
- 82.34 k-ft

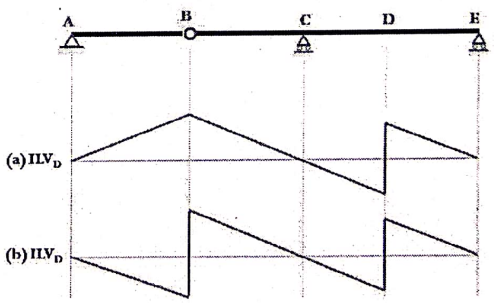
Suppose a simply supported beam with 10 ft span is subjected to a 10k concentrated load at mid point. Find maximum deflection. [EI=1]. 2 points

- 208
- 125
- 1302
- 500





Which is the correct IL diagram for shear at 'D'? 2 points




- Both 'a' & 'b'
- b
- a
- None of the above

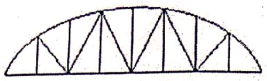
Which of the following statements is not correct regarding trusses? 2 points

- A truss is a configuration, which is designed to sustain inclined, vertical, horizontal loads accruing at or between its points of support
- The general configuration of a truss is triangle

...e truss members are connected of their end by frictionless pin or hinge or fixed joint

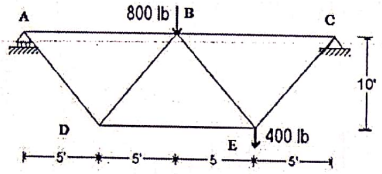
- The loads are applied only at joints and not at the intermediate points of a member

Mention the type of truss as shown in the following fig. 2 points



- Howe truss
- Bow string
- Fink truss
- Crescent truss

Analyze the truss shown in figure below. Assume all member area is 1 in2. Find stress (lb/in2) of the members AB, DE, CE and BE respectively. 6 points




- 500, 250, 782.6, 559
- 280, 360, 782.6, 250
- 250, 350, 782.6, 250
- 250, 500, 782.6, 335.4



Compute the design stress using the data given in the following Table 4 points

| Member | Dead load (Kips.) | Wind load stress (Kips.) | | | | | Design stress |
|---|---|---|---|---|---|---|---|
| | | Dutchmen wind force | | External force+Internal pressure | | External force+Internal suction | |
| | | Left | Right | Left | Right | Left | Right |
| AB | -31.47 | 13.60 | 22.08 | -21.79 | -29.60 | 3.05 | 4.88 |
| BC | 29.86 | -27.79 | -15.42 | 24.55 | 58.77 | -6.14 | -3.04 |
| CD | -28.95 | -15.42 | -12.95 | 13.21 | 54.55 | -3.40 | -2.56 |
| DE | 31.47 | 24.50 | 1.38 | -17.19 | -55.02 | 7.62 | 0.305 |

- -53.26, 68.63-44.37, and 65.97
- -61.07, 68.63, 25.6, and 65.97
- -61.07, 68.63, -44.37, and 65.97
- -61.07, 68.63, 25.6, and 66.49

Find design of rivet value for the given data. 4 points

Allowable Shear stress = 18 Ksi (Single Shear), Allowable Shear stress = 36 Ksi (Double Shear), Allowable Bear stress = 45 Ksi (Double Bear), Size of gusset plate = $\frac{9}{16}$" (Thickness), Size of the rivet = $\frac{7}{8}$" ϕ

- 22.14
- 21.63
- 21.29





- 22.63

Submit