Course Title: Bangladesh Studies: Society and Culture   **Course Code: HSS 211(a)**

Credit: 2.00

Time: 1 Hour   **Full Marks: 40**

There are **FIVE** questions. Answer **ANY FOUR** (4x10)

1. Define sociological imagination with an example. Explain functionalist and conflict perspective with examples from your own society.   2+8

2. How did G. Lenski classify different types of society? Discuss any two types of societies with examples.   2+8

3. Discuss the steps in doing social research with examples.   10

4. What is culture? Discuss the elements of culture with examples.   2+8

5. All counter cultures are subculture - examine this statement in the light of religious extremist groups.   10

University of Asia Pacific
Department of Basic Sciences and Humanities
Mid Semester Examination, Spring - 2016
Program: B.Sc. Engineering (Civil)
2nd year 1st semester

Course Title: Bangladesh Studies: History   Course Code: HSS 211(b)   Credit: 2.00

Total Time: 1 Hour   Full Marks: 40

There are **Five** Questions. Answer any **Four.** All questions are of equal value (4 x 10)

1. What were *janapadas*? Identify some *janapadas* of ancient Bengal and their present location.

2. Who was the first known king of Bengal? Analyze his activities.

3. Which dynasty ruled Bengal for long 400 years? Who was the founder of this dynasty? How did he come to power?

4. Who united the territories of Satgaon, Lakhnauti and Sonargaon? Do you think he used religion as a political strategy?

5. Who defeated *Bara Bhuiyans* and how?

Course Title: Engineering Materials   Course Code: CE 201
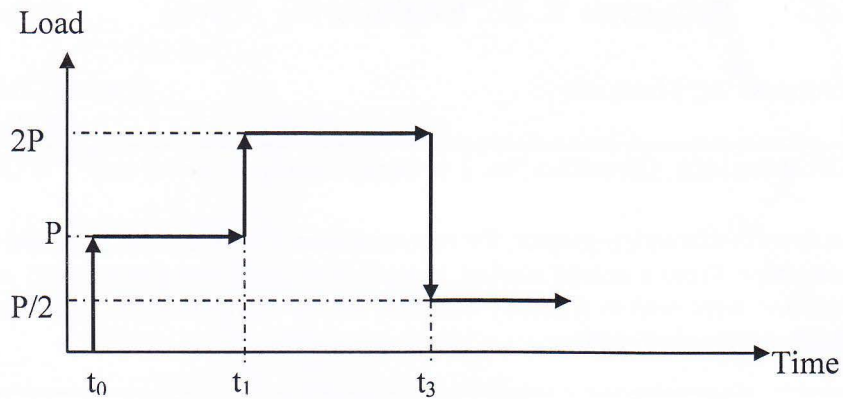Time: 1 Hours   Full Marks: 40

There are **FOUR** questions. **Question No. 1 is compulsory**. Answer any **TWO** from the rest.

1. (a) For a culvert construction project, the recommended FM is 2.6 for sand and 6.6   (20)
         for stone chips. From a nearby market, two samples (sand and stone chips) were
         collected and were sent to a nearby concrete lab for sieve analysis. The data of
         sieve analysis are given below:

Sieve No.	Materials Retained in gm	
	Sand	Stone Chips
1/2 inch	0	1100
3/8 inch	0	900
#4	0	2000
#8	0	950
#12 (1.68 mm)	55	0
#16	75	0
#30	75	0
#40 (0.425 mm)	75	0
#50	0	0
# 100	75	0
PAN	45	50

i) Determine the FM of the samples (sand and stone chips).
ii) Draw the grading curves of the samples (sand and stone chips) in the same graph paper.
iii) Comment on the grading of sample based on sieve analysis and gradation curve.
iv) From another source, another sand sample was collected and FM was found to be 3.0. In what proportions, sand samples are to be mixed to achieve the recommended FM for sand?

2. (a) Explain bulking of sand   (2.5)

    (b) Briefly state the adhesive strength test of mortar.   (2.5)

    (c) Draw the predicted strain response curve of the elasto-plastic material for the   (5)
         following loading history.

3. **(a)** What is sound cement? How can you determine soundness of cement? $(2+2=4)$

(b) Compare setting and hardening. (2)

(c) Write down the specialty of Rapid Hardening Cement in composition and uses over OPC. (2)

(d) Mention the limiting values of (i) Crushing Strength, (ii) Absorption Capacity for the various types of bricks. (2)

4. **(a)** Draw the characteristics stress strain curve of mild steel. (3)

(b) Compare Fly Ash Cement with OPC in terms of strength. Which one do you prefer? Explain. (4)

(c) Define ductility, malleability & brittleness. (3)

Course No: CE 201 (A)   Time: 1 Hour
Course Title: Engineering Materials   Full Marks: 60

Answer any THREE questions (3 x 20=60) including Question No. 2. and Question 3.
Question No. 2 and Question No. 3 are compulsory.

1. The Sieve analysis data of a sand sample for a building construction project are summarized below: **(20)**

ASTM Sieve	Amount Retained (g)
3 inch	0
1.5 inch	0
¾ inch	0
3/8 inch	0
#4	0
#8	50
#12	50
#16	0
#30	100
#40	100
#50	0
#100	100
#200	50
Pan	50

(i)   Calculate the FM of the sand sample,
(ii)   Draw the grading curve for the sand sample, make comments over the curve
(iii)   Make a brief discussion on the FM, sieve analysis data, and grading curve,
(iv)   What measures are necessary to improve the grading of the sand sample?

[Sieve opening: #12- 1.7 mm, #40-0.425 mm, #200- 0.075 mm]

2.   **(a)** Write short notes on: (i) Malleability, (ii) creep, (iii) Fatigue   **(6)**

      (b) Discuss the reasons for formation of efflorescence on brick surface.   **(3)**

      (c) What are the constituents of brick clay? Explain their functions.   **(5)**

      (d) Draw stress-strain curve for the following materials: **(4)**

          (i) Concrete with different strength

          (ii) Steel with different grades

          (iii) Rubber

          (iv) Copper

      (e) Explain different possible moisture condition of aggregates.   **(2)**

3. **(a)** What are the advantages and disadvantages of clamp burning? **(4)**

(b) Explain the cement manufacturing process in dry process. **(4)**

(c) What is hydration of cement? What are the functions of various ingredients of cement? **(6)**

(d) Write short note on the following: **(6)**

      (i) Cement fineness

      (ii) Slag cement

      (iii) Fly ash cement

4. Mix design of mortar is necessary for plastering work of a brick wall of 20 ft long and 6 ft height. The following data are provided: **(20)**

Sand to cement ratio (weight basis) = 3,

W/C = 0.50,
Cement type = CEM II B/M,
Specific gravity of sand = 2.55,
Air content = 1%,

Mortar thickness = 5 mm (on one side of the wall).

    (i)   Calculate the unit contents of sand, cement, and water,

    (ii)   Calculate the unit weight of mortar,

    (iii)   Estimate the amount of each ingredient (in weight and volume) of mortar necessary for the plastering work of the both surface of the wall. Assume 15% extra volume of material is necessary due to the loss of mortar during application on the wall. Unit weight of cement (with void) = 1410 kg/m^3 and unit weight of sand (with void) = 150 kg/m^3.

    (iv)   What adjustment in sand volume is necessary, if bulking of sand is 15%?

University of Asia Pacific
Department of Civil Engineering
Mid Semester Examination Spring 2016

Course No: CE 201 (A)   Time: 1 Hour
Course Title: Engineering Materials   Full Marks: 60

Answer any THREE questions (3 x 20=60) including Question No. 2. and Question 3.
Question No. 2 and Question No. 3 are compulsory.

1. The Sieve analysis data of a sand sample for a building construction project are summarized below: **(20)**

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#50	0
#100	100
#200	50
Pan	50

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Specific gravity of sand = 2.55,
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Mortar thickness = 5 mm (on one side of the wall).

(i) Calculate the unit contents of sand, cement, and water,
(ii) Calculate the unit weight of mortar,
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(iv) What adjustment in sand volume is necessary, if bulking of sand is 15%?

Course Title: Engineering Materials　　　　　　　　Course Code: CE 201
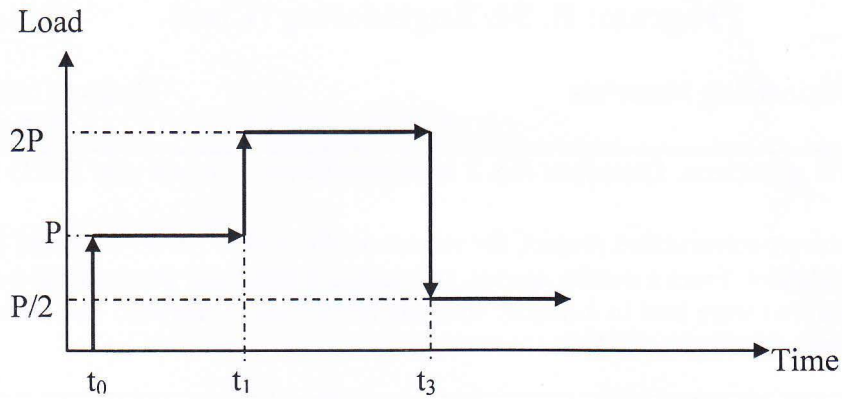Time: 1 Hours　　　　　　　　　　　　　　　　　　Full Marks: 40

There are **FOUR** questions. **Question No. 1 is compulsory**. Answer any **TWO** from the rest.

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i) Determine the FM of the samples (sand and stone chips).
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3. **(a)** What is sound cement? How can you determine soundness of cement? (2+2=4)

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   (c) Define ductility, malleability & brittleness. (3)

Course Title: Mathematics III   Course Code: MTH 201   Course credit: 3.00

Time: 1 hr   Full Marks: 60

Answer any **three** of the followings: $3 \times 20 = 60$

1. **(a)** For this particular frequency distribution show that $A.M > G.M > H.M.$ **12**

Class	10-15	15-20	20-25	25-30	30-35	35-40
Frequency (f_i)	11	20	35	20	8	6

(b) Based on the following distribution below calculate the mean deviation (M.D.).   **8**

x_i	1320	1310	1315	1322	1326	1340	1325	1321	1320	1331

2. **(a)** Ten students got the following percentage of marks in Economics and Statistics. Calculate the coefficient of correlation.   **8**

Marks in Eco. (x_i)	78	36	98	25	75	82	90	62	65	39
Marks in Stat. (y_i)	84	51	91	60	68	62	86	58	53	47

(b) Derive the relationship between regression and correlation. Find the correlation co-efficient between x and y when the lines of regression are $5x + 2y = 9$ and $x + 3y - 7 = 0$.   **4+8**

3. **(a)** Find the first four moments about origin $(A = 0)$ **8**

x_i	2	3	4	5	6
f_i	1	3	7	3	1

(b) An analysis of companies resulted in the following distribution. Calculate the Bowley's co-efficient of skewness.   **12**

Profits(Lakhs)	10-20	20-30	30-40	40-50	50-60
f_i	18	20	30	22	10

4. **(a)** Define random variable. A random variable X has the following function   **2+6**

$$f(x) = \begin{cases} x & ; \ 0 < x < 1 \\ 2 - x & ; 1 < x < 2 \\ 0 & ; \ elsewhere \end{cases}$$

(i) Check whether it is a probability density function (ii) Find $P[X > 0.5]$

(b) Consider the following joint probability density function of X and Y **12**

$$f(x,y) = \begin{cases} x^2 + \frac{xy}{3}; & 0 \le x \le 1, \ 0 \le y \le 2 \\ 0 & ; \ elsewhere \end{cases}$$

(i) Verify that $\int\limits_{\infty}^{\infty} \int\limits_{\infty}^{\infty} f(x,y) \, dy \, dx = 1$ (iii) Find the marginal distributions of X and Y.

University of Asia Pacific
Department of Civil Engineering
Mid Semester Examination, Spring-2016
Program: B. Sc Engineering (2nd Year / 1st Semester)

Course Title: Basic Electrical Engineering   Course No. ECE(CE) 201   Credits: 3.00
Time: 1.00 Hour   Full Marks: 60

There are **Four** Questions. Answer any **Three**. Figures in the right margin indicate marks.
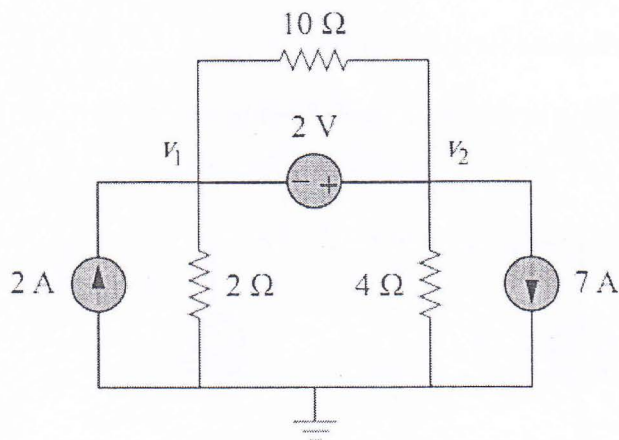
1. (a)   Calculate the equivalent resistance R_{ab} at terminals a-b.   10
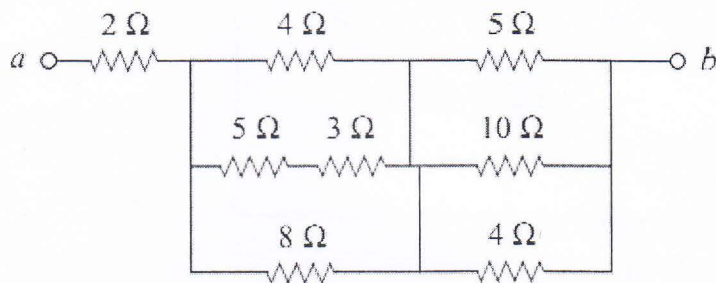
Circuit diagram for question 1(a)

   (b)   Write short notes on the following terms   2.5*4=10
         (i)   Ohm's law
         (ii)   Superposition theorem
         (iii)   Thevenin's theorem
         (iv)   Maximum power transfer theorem

2. (a)   For the following circuit, find the node voltages using nodal analysis.   10

Circuit diagram for question 2(a)

(b) For the following circuit, find I_1, I_2 and I_3 using mesh analysis.   10
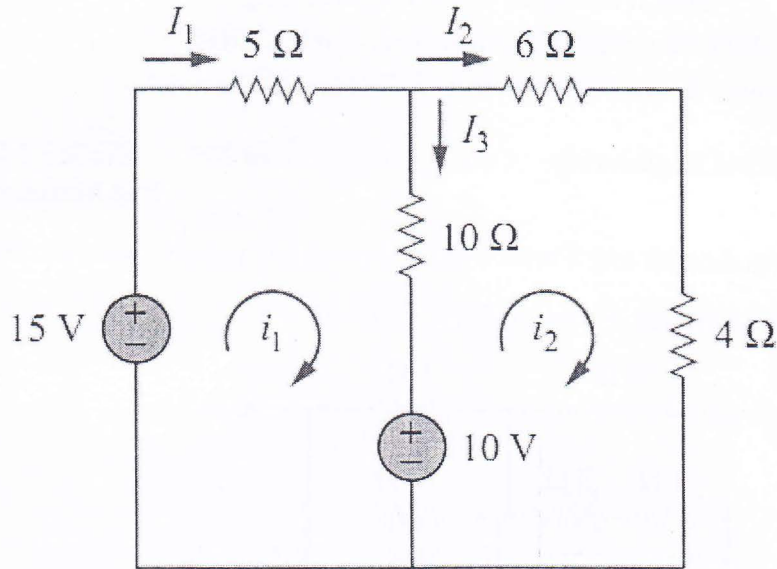
Circuit diagram for question 2(b)

3. (a) Use the Superposition theorem to find **v** in the following circuit.   10
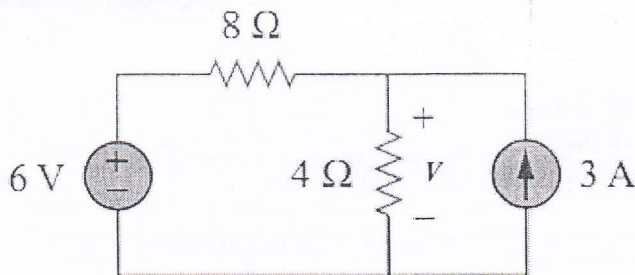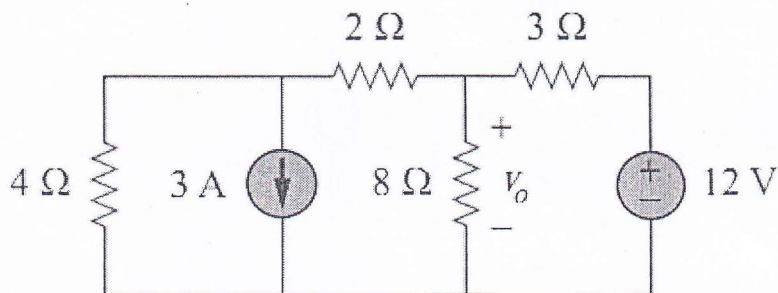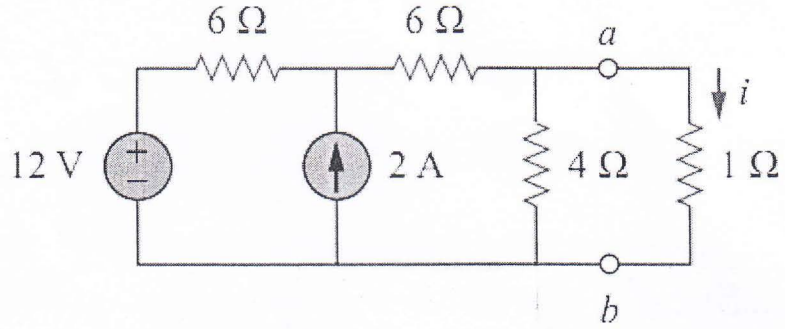

Circuit diagram for question 3(a)

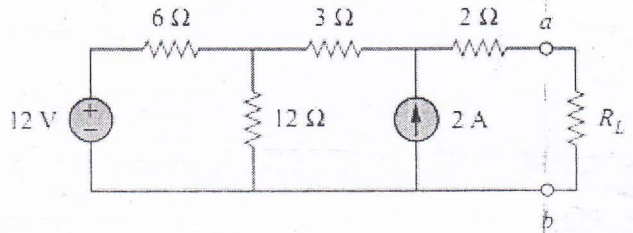(b) Use Source Transformation to find v_o in the following circuit.   10

Circuit diagram for question 3(b)

4. (a) Using Thevenin's theorem, find the equivalent circuit to the left of the terminals in the following circuit and then find i.   10

Circuit diagram for question 4(a)

(b) Find the value of R_L for maximum power transfer and find the maximum power.   10

Circuit diagram for question 4(b)

University of Asia Pacific
Department of Civil Engineering
Mid Examination Spring 2016
Program: B.Sc. in Civil Engineering

Course Title: Mechanics of Solids I   Course Code: CE 211
Full Marks: 60 (=20×3)   Time: 1 hours

There are **FOUR (4)** questions in this paper. Answer any Three of the following questions.
Each questions has equal marks.

1. The cross sectional area of the each member is 1.8 in² for the given truss shown in the figure 1. Determine the stresses in member CE, DE and DF.
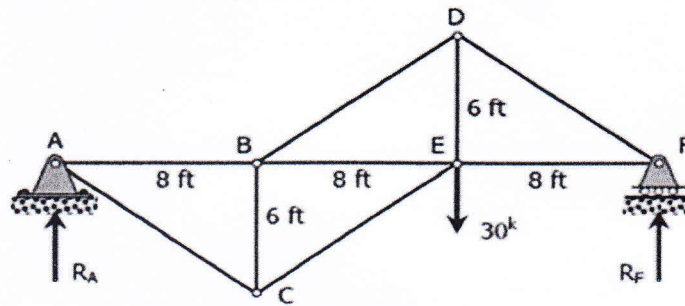

Figure 1

2. The maximum overall deformation of the given composite bar is 3.0 mm.(shown in figure 2) Allowable stress for steel, bronze and aluminum are 140 Mpa , 120 Mpa and 80 Mpa respectively. Find the value of Load **P** where E_{st}=200 Gpa, E_{all}= 70 Gpa and E_{br}= 83 Gpa.
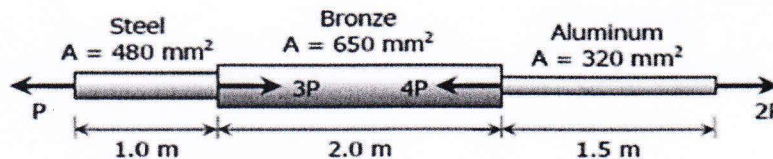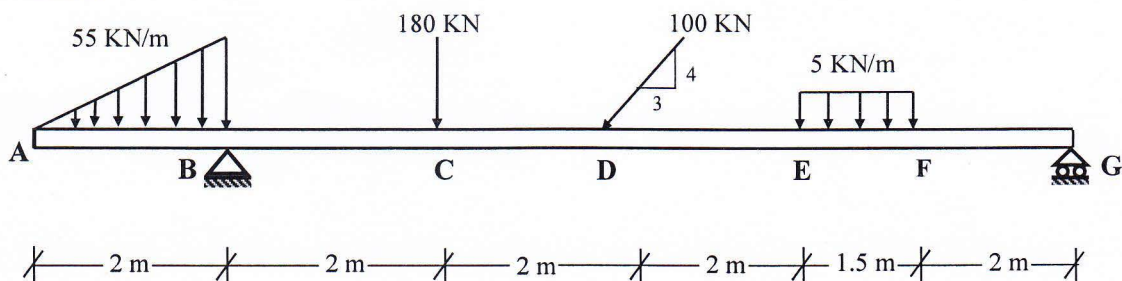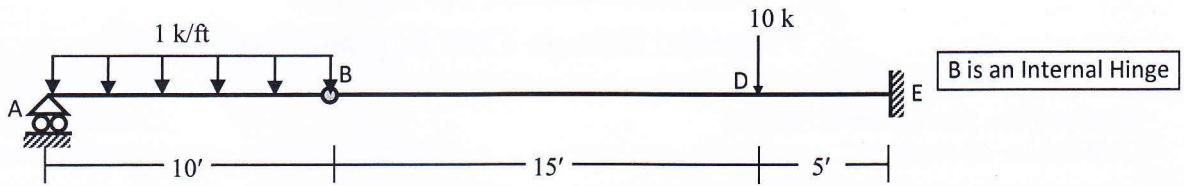

Figure 2

3. Draw axial force, shear force and bending moment diagrams for the beam loaded as shown below.

4. Draw axial force, shear force and bending moment diagrams for the beam loaded as shown below.

1 k/ft

10 k

B

D

E

B is an Internal Hinge

A

10′   15′   5′

University of Asia Pacific
Department of Civil Engineering
## Mid Term Examination Spring-2016
Program: B.Sc. Engineering (Civil)

Course Title: Mechanics of Solids I　　　　**Section-A**　　　　Course Code: CE 211
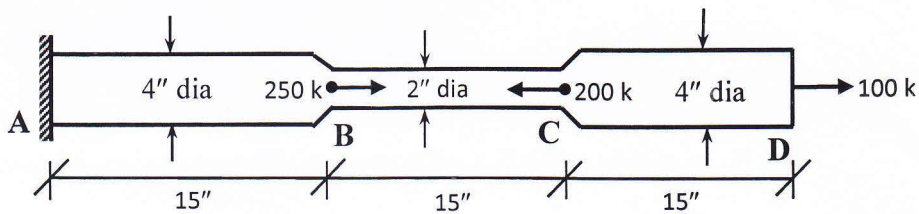Full Marks: 30 (=3×10)　　　　　　　　　　　　　　　　　　　　Time: 1 hour

Answer all of the **THREE (3)** questions. Each question has equal marks.

1. Calculate **area of members FG and CH** in the truss shown below. Given the allowable tensile stress is 130 MPa and the allowable compressive stress is 150 MPa.

250 kN　　　　　　　　450 kN

F　　G　　H

5 / 4
3

1.5m

A

B　　C　　D　　E

4 equal spaces at 1.25m=5.0m
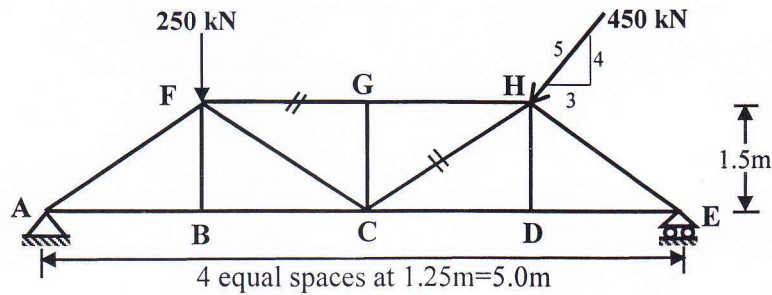
2. Calculate **the axial deformations** at point B, C and D of the axially loaded bars shown below. Let E = 29000 ksi. Also draw the axial displacement diagram.

4″ dia　　250 k　2″ dia　　200 k　4″ dia　　100 k

A

B　　　C　　　D

15″　　　　15″　　　　15″

3. Draw **axial force, shear force and bending moment diagrams** for the beam loaded as shown below.

30 kN/m　　　　　4　180 kN　　　　　　　80 kN/m

3

A

B　　　C　　　D　　　E　　　F

2 m　　2 m　　2 m　　2 m　　1.5 m