

University of Asia Pacific
Department of Basic Sciences and Humanities
Mid Semester Examination, Fall 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. Write down a short note on Shomapura Mahavihara.

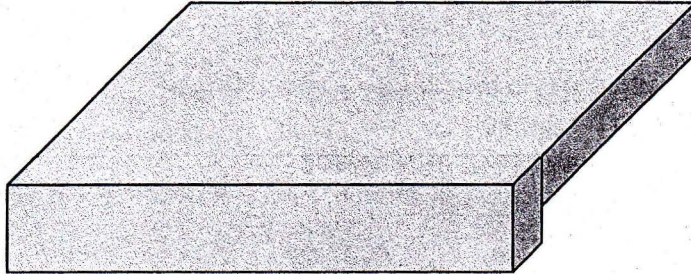
University of Asia Pacific
Department of Civil Engineering
Mid Semester Examination Fall 2016

Course No: CE 201 (A)
Course Title: Engineering Materials

Time: 1 Hour
Full Marks: 60

1. (a) Write short notes on: (i) Relaxation, (ii) Modulus of Elasticity, (iii) Fatigue (6)
(b) Discuss the harmful constituents of clay bricks. (3)
(c) What are the advantages and disadvantages of Hoffman kiln? (3)
(d) Draw stress-strain curve for the following materials: (4)
 (i) Concrete with different strength
 (ii) Steel with different grades
 (iii) Rubber
 (iv) Glass
(e) What is Fineness modulus (FM) of aggregate? Discuss the importance of aggregate gradation in construction works. (4)
2. (a) Explain the cement manufacturing process in dry process. (5)
(b) Compare the effects of supplementary cementing materials with respect to the following: (10)
 (i) Water requirement
 (ii) Workability
 (iii) Bleeding and segregation
 (iv) Heat of hydration
 (v) Setting time
 (vi) Pumpability
 (vii) Finishability
 (viii) Strength gain
 (ix) Creep and drying shrinkage
 (x) Permeability
(c) What is hydration of cement? Draw the curve of time versus heat evolution for Portland composite cement. (5)

3. Mix design of mortar is necessary for plastering work of the following slab (15ft x 15ft x 6in) connected to a beam (15ft x 15in x 12in): (20)



The following data are provided:

Sand to cement ratio (weight basis) = 3.5,

Required 28 days strength = 31.03 MPa,
(W/C vs Compressive strength graph given in **Figure 1**)

Cement type = CEM II A/M,

Specific gravity of sand = 2.60,

Air content = 0.50%,

Absorption capacity of sand = 3%

- (i) Calculate the unit contents of sand, cement, and water (consider the materials are in SSD condition)
- (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 members. Assume 15% extra volume of material is necessary due to the loss of mortar during application. Unit weight of cement (with void) = 1410 kg/m^3 and unit weight of sand (with void) = 1600 kg/m^3 .
- (iv) What adjustment in water is necessary, if the sand is dry?

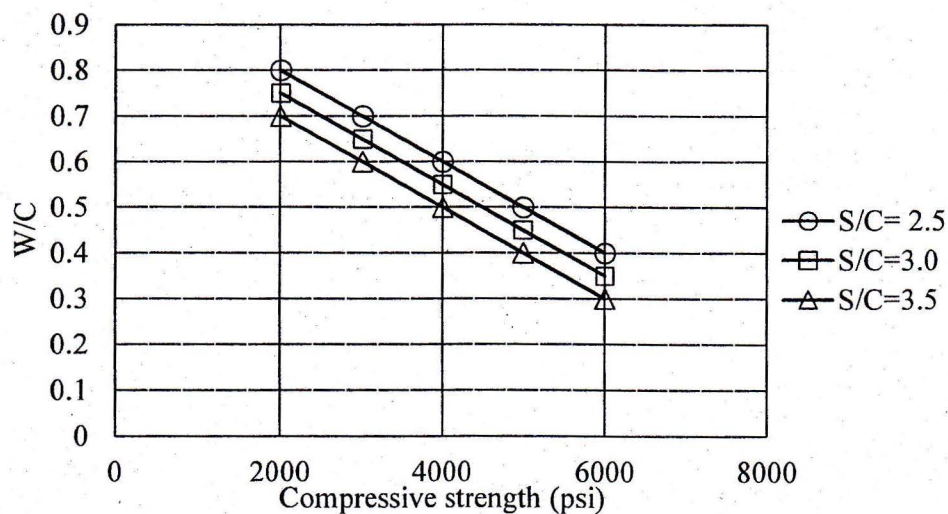


Figure 1

10-A

University of Asia Pacific
Department of Basic Sciences and Humanities
Mid Semester Examination, Fall 2016
Programme: B. Sc. Engineering (Civil)
(2nd Year 1st Semester)

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)

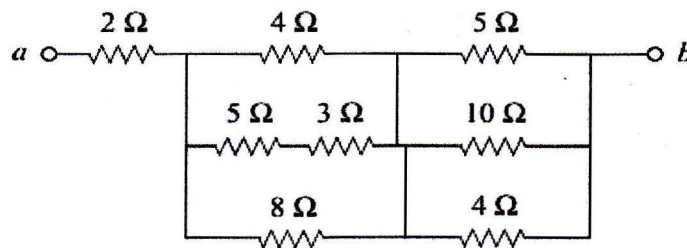
1. What are the three sociological perspectives used by sociologists? Explain any two of them. 2+8
2. Write an essay on post-industrialism. 10
3. What are the steps in doing social research? Briefly discuss any one of the sociological research designs. 3+7
4. What is culture? Discuss the nonmaterial elements of culture with examples. 2+8
5. Write short notes on: 5+5
 - A. High Culture and Popular Culture
 - B. Cultural Lag

University of Asia Pacific
Department of Civil Engineering
Mid Semester Examination, Fall-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

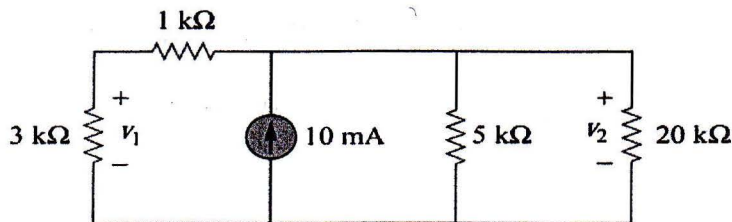
There are **Four** Questions. Answer any **Three**. Figures in the right margin indicate marks.

1. (a) Calculate the equivalent resistance R_{ab} at terminals a-b. 10



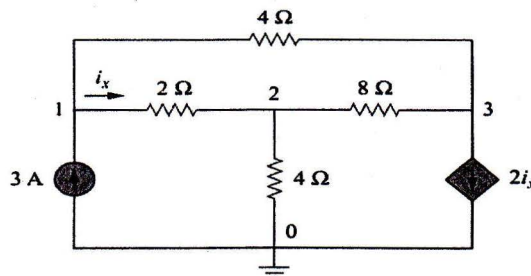
Circuit diagram for question 1(a)

- (b) For the following circuit, find: (a) v_1 and v_2 , (b) the power dissipated in the 3-k and 20-k resistors, and (c) the power supplied by the current source. 10



Circuit diagram for question 1(b)

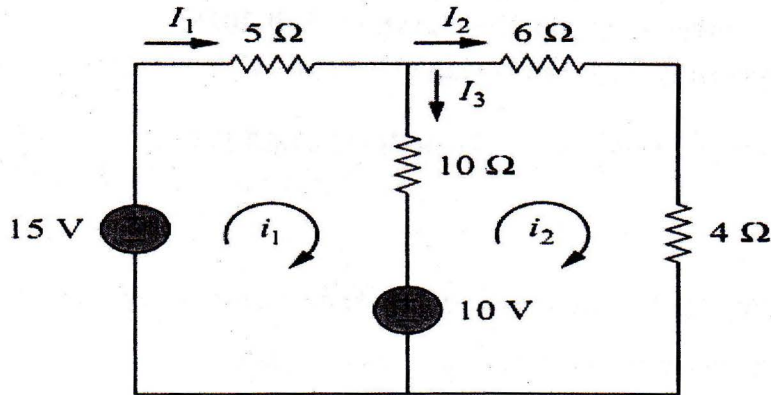
2. (a) For the following circuit, find the node voltages using nodal analysis. 10



Circuit diagram for question 2(a)

(b) For the following circuit, find I_1, I_2 and I_3 using mesh analysis.

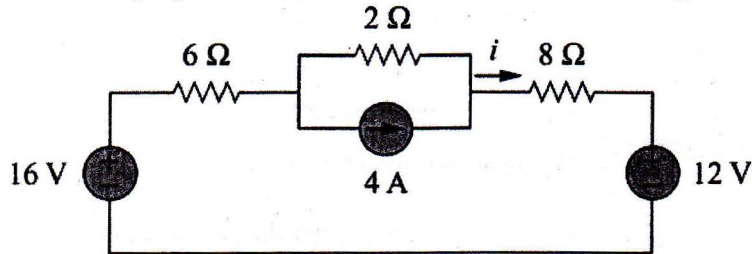
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Circuit diagram for question 2(b)

3. (a) Use the Superposition theorem to find i in the following circuit.

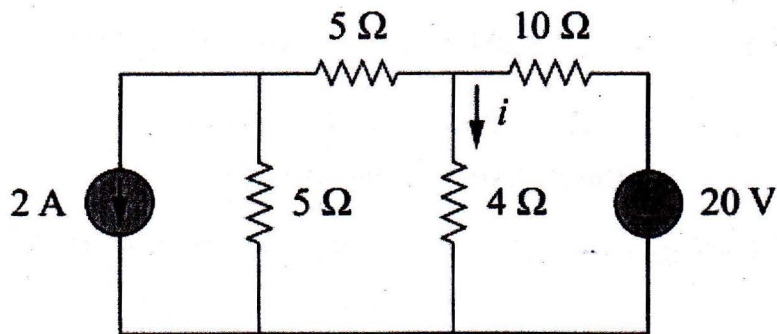
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Circuit diagram for question 3(a)

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

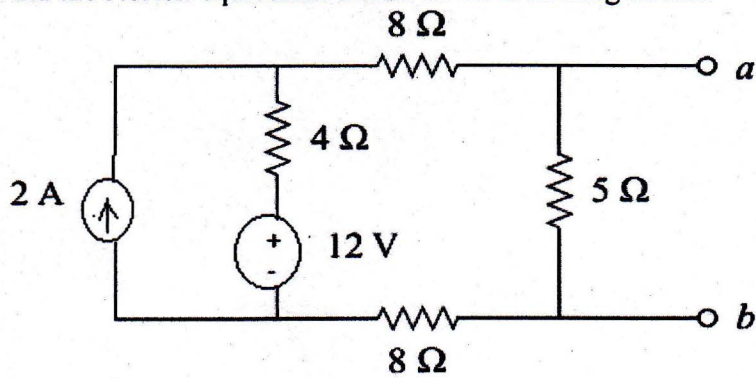
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Circuit diagram for question 3(b)

4. (a) Find the Norton equivalent circuit of the following circuit.

10



Circuit diagram for question 4(a)

(b) Write short note on the following topics

10

- i. KCL
- ii. Norton's theorem
- iii. Superposition theorem
- iv. Ohm's law

University of Asia Pacific
Department of Basic Sciences and Humanities
Mid Semester Examination Fall-2016
Program: B. Sc Engineering (Civil)
(2nd Year/ 1st Semester)

Course Title: Mathematics III

Course No. MTH 201

Credits: 3.00

Time: 1.00 Hour

Full Marks: 60

There are **Four** Questions. Answer any **Three** . All questions are of equal value/Figures in the right margin indicate marks.

1. (a) Calculate Mean Deviation and then calculate Quartile Deviation using relation for the following data 10

marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
no.of students	6	5	8	15	7	6	3

- (b) Calculate Variance for the following data 10

profit(lakhs)	10-20	20-30	30-40	40-50	50-60
no.of companies	8	12	20	6	4

2. An analysis of companies resulted in the following distribution 20

profit(lakhs)	70-90	90-110	110-130	130-150	150-170
no.of companies	8	11	18	9	4

Calculate the first four moments about assumed mean. Convert the result into moments about mean. Also measure the skewness and kurtosis of the given distribution.

3. (a) A pair of dice is rolled. The 36 different possible results are illustrated in the 2D grid. Find the probability of getting 7

- (1) a 5 and a 6
- (2) a 5 or a 6
- (3) atleast one 5
- (4) exactly one 5
- (5) a sum of 8
- (6) a sum of 7 or 11

- (b) Two coins are tossed. A is the event 'getting two heads' and B is the event 'second coin shows head'. Find $P(A \cup B)$. 7

(c) Probability function is $f(x) = \begin{cases} \alpha \left(\frac{3}{4}\right)^x, & x = 0, 1, 2, \dots, \infty \\ 0, & \text{otherwise} \end{cases}$ 6

Evaluate α and find $P(X \leq 3)$.

4. (a) Find the marginal densities of X and Y from the following joint density function and verify that marginal distribution are also 7

probability distribution. $f(x, y) = \begin{cases} \frac{1}{8}(6 - x - y), & 0 < x < 1, 2 < y < 4 \\ 0, & \text{otherwise} \end{cases}$

- (b) Check whether the random variable X, Y are independent if their joint density function is $f(x, y) = \begin{cases} 4xy, & 0 < x < 1, 0 < y < 1 \\ 0, & \text{otherwise} \end{cases}$ 7

- (c) A pair of dice is thrown. Find the probability that sum of the points on the two dice is 9 or greater if a 5 appears on the first die. 6

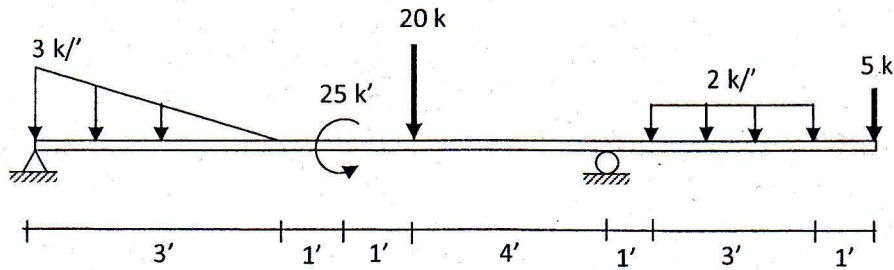
University of Asia Pacific
Department of Civil Engineering
Mid-Term Examination Fall 2016

Course Code: CE 211 (A)
 Course Title: Mechanics of Solids I

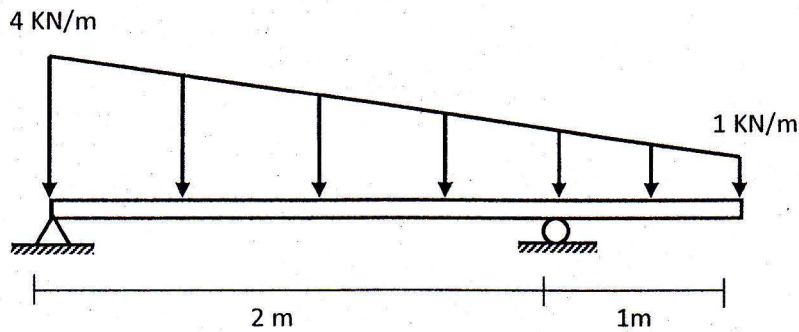
Time: 1 (one) Hour
 Full Marks: (3x20) = 60

Answer all questions.
Each question carries equal marks

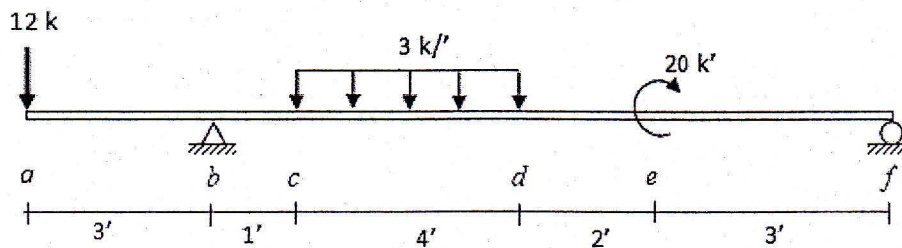
1. Draw Shear Force and Bending Moment Diagram for the following beam loading.



2. Determine the functions for loading, shear and bending moment for the following beam.



3. For the beam shown below, derive equations for shear and bending moment using singularity function and also determine shear force at c and bending moment at d .



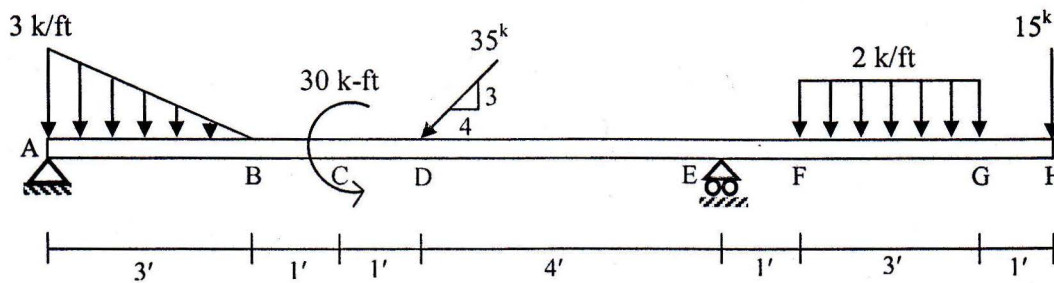
University of Asia Pacific
Department of Civil Engineering
Mid-Term Examination, Fall 2016
Program: B.Sc. Engineering (Civil)

Section: B

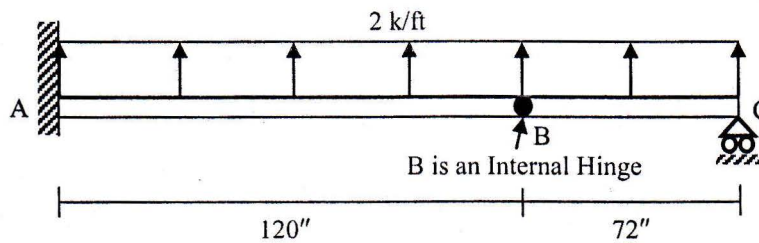
Course Code: CE 211
 Course Title: Mechanics of Solids I

Time: 1 Hour
 Full Marks: (3*10) = 30

1. Draw the Axial Force, Shear Force and Bending Moment diagrams for the beam loaded as shown below.



2. Draw Shear Force and Bending Moment diagrams for the beam loaded as shown below.



3. Use Singularity function to write equations of SF and BM for the beam loaded as shown below.

