

University of Asia Pacific
Department of Civil Engineering
Mid Semester Examination (Spring-2016)
Program: B.Sc. (Honours) in Civil Engineering
Year: 2016 Semester: Spring 2016

Course Code: HSS 101

Course Title: English Language I

Time: 1 hour

Full Marks: 20

*Marks are indicated in the right Side of margin

1. Write a short biography of Albert Einstein by using the following information (5)

Timeline

- 1879 Albert Einstein was born in Ulm, in the Kingdom of Württemberg in the German Empire
- 1887 admitted to the Luitpold Gymnasium (now known as the Albert Einstein Gymnasium), where he received advanced primary and secondary school education
- 1895 at the age of 16, Einstein sat the entrance examinations for the Swiss Federal Polytechnic in Zürich. He failed to reach the required standard in the general part of the examination, but obtained exceptional grades in physics and mathematics.
- 1896 he enrolled in the four-year mathematics and physics teaching diploma program at the Zürich Polytechnic, where she met his future wife Mileva Marić.
- 1900 graduated, but spent 2 years in frustration searching for a teaching job.
- 1901 acquired Swiss citizenship
- 1903 got married with Maric. One year later their fist son Hans Albert Einstein, was born in Bern, Switzerland.
- 1908 was recognized as a leading scientist and was appointed lecturer at the University of Bern
- 1911 accepted Austrian citizenship and became a full professor at the German Charles-Ferdinand University in Prague
- 1920 became a Foreign Member of the Royal Netherlands Academy of Arts and Sciences
- 1921 was awarded the Nobel Prize in Physics for his services to Theoretical Physics, and especially for his discovery of the law of the photoelectric effect
- 1955 experienced internal bleeding and died in Princeton Hospital at the age of 76

2. Transform the following sentences (without changing the meaning) according to the instruction inside the bracket

(0.5 x 6 = 03)

- a) I want to leave now. (negative)
- b) He apologized for his conduct. (interrogative)
- c) I could not catch the bus. (affirmative)
- d) I was doubtful of your sincerity. (negative)
- e) Everybody has heard of Gandhi. (interrogative)
- f) He is so proud that he will not beg. (affirmative)

3. Use necessary articles (put cross mark if not needed).

(0.5 x 8 = 04)

- a) My grandmother is in hospital, so we went to visit her last night.
- b) Scientists sent expedition to Mars during 1990s.
- c) Last night there was bird singing outside my house.
- d) California State University is smaller than University of California.

4. Use necessary prepositions

(0.5 x 8 = 04)

- a) We live London.
- b) We are going holiday next week.
- c) The flight Leipzig London was via Frankfurt.
- d) my wall, there are many picture postcards.
- e) Come the sitting room, we want watch TV.
- f) Munich lies 530 meters sea level.

5. Use right form of tense

(0.5 x 8 = 04)

- a) I (go) there last year.
- b) The doctor (die) before the patient (come).
- c) We (read) the book before the exam starts.
- d) I (learn) piano since I was 19.
- e) You (know) nothing, John Snow.
- f) I think we (win) the match.
- g) They (swim) this afternoon for an hour.
- h) We (reach) by this time.

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

Course No: CE 107
Full Marks: 60 (4 x 15)

Course Title: Introduction to Civil & Env. Engg.
Time: 1 hour

PART I

There are **THREE** questions. Answer any **TWO**.
[Assume reasonable value of missing data (if any)]

1. (a) Define *Environmental Ethics*. [5]
(b) Describe the types of environment in detail. [10]
2. (a) Mention the major constituents (with percentage) of our atmosphere. [5]
(b) What are the study areas covered by Environmental Engineering? "The Environmental Engineers are essential for our society"-- why? [10]
3. (a) Show the distribution of world total water resource using pie charts. [5]
(b) Define biotic component and abiotic component of environment. State the relationship between these two. [10]

PART II

There are **THREE** questions. Answer any **TWO**.

4. (a) Discuss science, engineering and technology with the aid of a diagram showing their interrelationships. [15]
5. (a) Define civil engineering according to ASCE. [3]
(b) What is infrastructure? Give a few examples of infrastructure. [5]
(c) Write down two major roles of civil engineers in infrastructure development. [2]
(d) What should be the major foci of any civil engineering project? [3]
(e) Write down a few names of some interdisciplinary professions in relation to civil engineering. [2]
6. (a) For the following square plot, calculate the total floor area and the number of stories that can be built for a residential building. [8]
(b) Discuss, in short, "Civil Engineering" as a career. [7]

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University of Asia Pacific
Department of Basic Sciences and Humanities
Mid-Semester Examination Spring – 2016
Program: B. Sc Engineering (CE)

Course Title: Physics
Time: 1.00 Hour

Course Code: PHY-101

Credit: 3.00
Full Mark: 60

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

1. (a) Derive that the maximum possible value of Poisson's ratio is $\frac{1}{2}$. [12]
- (b) A wire of length 2 m and diameter 10^{-3} m is stretched by 12×10^{-4} m by a load 10 kg. Calculate the Young's modulus of the wire. [08]
2. (a) Prove that in case of volume strain, the work done per unit volume is equal to $\frac{1}{2} \times \text{Stress} \times \text{Strain}$. [12]
- (b) Calculate the work done in stretching a uniform metal wire of area of cross section 10^{-6} m² and length 3 m through 8×10^{-3} m. Given $Y = 2 \times 10^{11}$ N/m². [08]
3. (a) Show that the moment of inertia of a solid sphere is $\frac{2}{5}MR^2$ about its diameter, where the symbols have their usual meanings. [12]
- (b) A circular disc of mass M and radius R is set rolling on a table with a velocity v . Show that the total kinetic energy is $0.75 Mv^2$. [08]
4. Establish that the equation for the intensity at a point on the screen in Young's experiment can be written as [20]

$$I = 4a^2 \cos^2 \frac{\delta}{2}$$

Where a and δ are the wave amplitude and the phase difference between the two waves reaching the point considered. Using this equation find out the conditions under which bright and dark fringes are observed.

University of Asia Pacific

Department of Electrical and Electronic Engineering

Mid-Semester Examination Spring-2016

Program: B. Sc Engineering (Civil)

(1st Year/ 1st Semester)

Course Title: Mathematics I

Course No. MTH 101

Credit: 3.00

Time: 1.00 Hours.

Full Mark: 60

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

1. (a) Discuss continuity and differentiability of $f(x)$, 14
where $f(x) = \begin{cases} 3 + 2x, & -\frac{3}{2} < x \leq 0 \\ 3 - 2x, & 0 < x \leq \frac{3}{2} \end{cases}$
- (b) Evaluate the following limits. $\lim_{x \rightarrow 0} \frac{e^x - e^{-x} - 2\ln(1+x)}{x \sin x}$. (using L'Hospital's rule). 6
2. (a) State Leibnitz's theorem. If $y = \tan^{-1}x$. Then show that $(1 + x^2)y_{n+2} + 2(n + 1)xy_{n+1} + (n^2 + n)y_n = 0$. 12
- (b) Discuss the applicability of the Mean Value Theorem (MVT) for the function $f(x) = x(x - 1)(x - 3)$ over $[2, 4]$. 8
3. Expand $f(x) = \ln(1 + x)$ in powers of x with remainder R_n in Lagrange's and Cauchy's form. 20
4. (a) Find the maximum and minimum value of the function $f(x) = 2x^3 - 6x^2 - 18x + 7$. 8
- (b) State Euler's theorem on homogeneous function. If $u = \tan^{-1} \frac{x^3 + y^3}{x + y}$, 12
then show that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \sin 2u$.

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

Course Title: Engineering Mechanics I
 Time: 1 hour

Course Code: CE 101 (Section A)
 Full Marks: 20

Answer all the following questions.

(5x4=20 marks)

1. Calculate the following for the beam shown in Figure 1,
 (i) the reactions at supports A and ~~D~~, (ii) the bending moments at B and ~~E~~ ∇

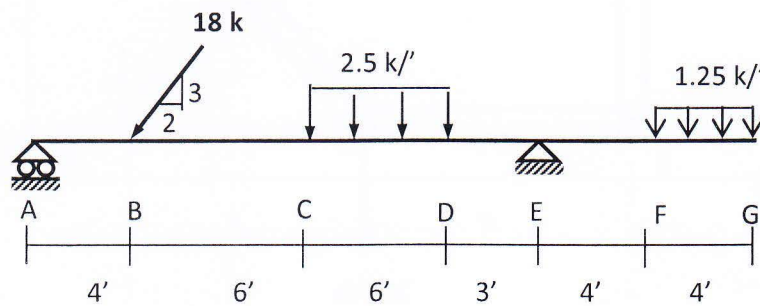


Figure 1

2. What force F is necessary in the wheel being on the point of moving over the obstruction A (shown in Figure 2). The wheel weighs 600 lb.

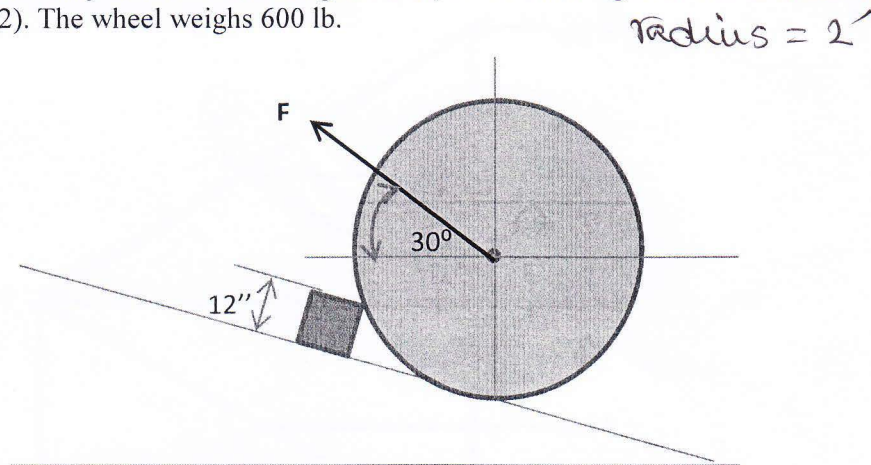


Figure 2

3. The frame (shown in Figure 3) consists of two horizontal members (AC and DF), which are connected by two members BE and CF. All the members are assumed to be weightless. (i) Calculate the reactions at pins A and D; (ii) Determine the force in member CF.

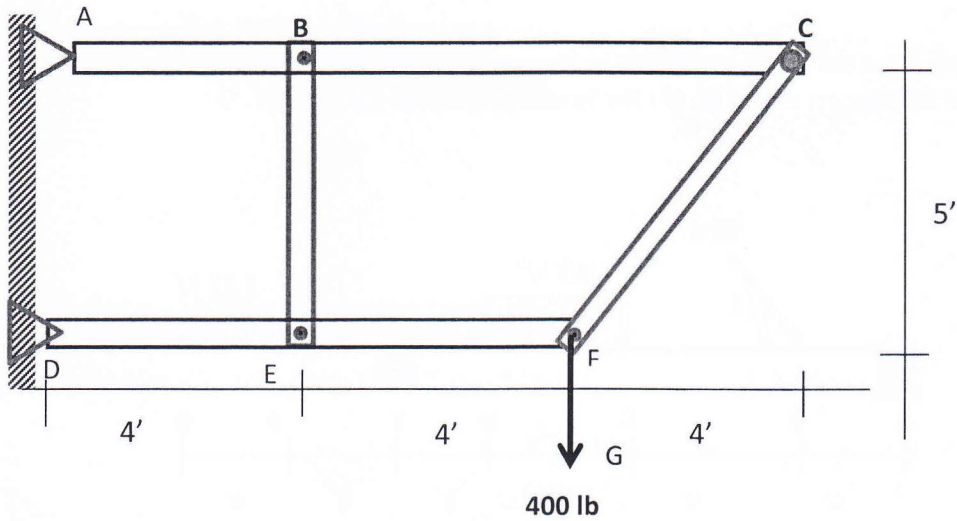


Figure 3

4. For the truss shown in Figure 4, determine the support reactions and the forces in the members AC and EH.

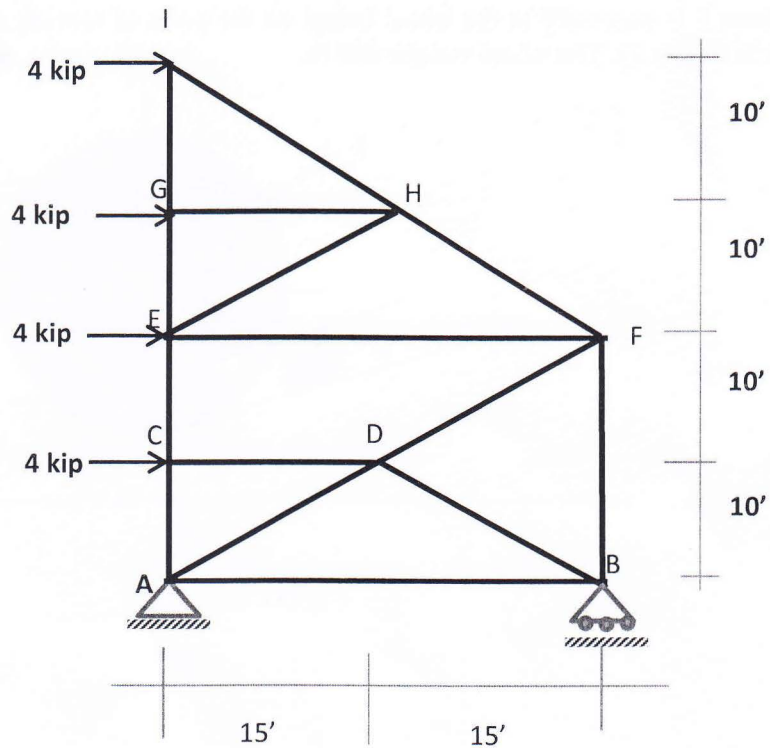


Figure 4

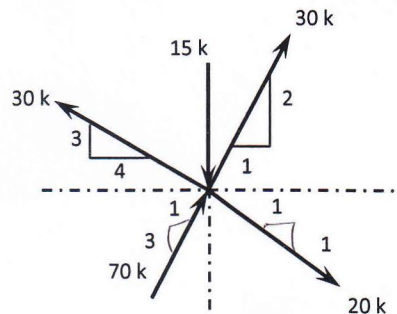
University of Asia Pacific
Department of Civil Engineering
Mid-Term Examination, Spring 2016

Course Code: CE 101 (B)
 Course Title: Engineering Mechanics I

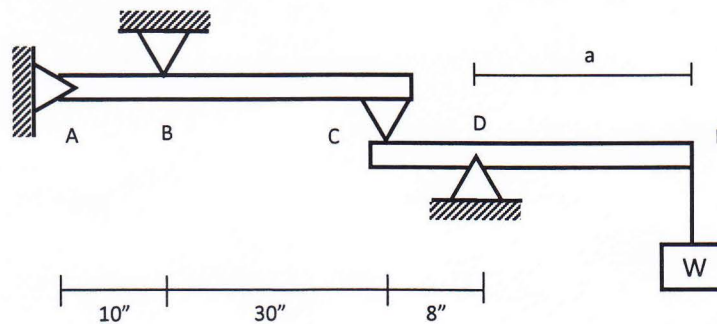
Time: 1 (one) Hour
 Full Marks: (3x10) = 30

Answer all questions.
Each question carries equal marks

1. Find the resultant and its direction for following concurrent force system.



2. Two horizontal members AC and CE are supported as shown in the figure. If a weight of $W=70$ lb is suspended at E and if $a=20''$, what is the reactions at A, B, C, D ? The members have uniform weight of 5 lb/ft.



3. For the truss shown below, determine the external reactions and forces in member CD, DG and GF .

