

University of Asia Pacific
Department of Civil Engineering
Mid Semester Examination (Fall 2017)
Program: B.Sc. (Honours) in Civil Engineering
Year: 1st Semester: 1st

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. Read the following passage and answer to the following questions (1 x 4 = 4)

Central Park, emerging from a period of abuse and neglect, remains one of the most popular attractions in New York City, with half a million out-of-towners among the more than 3 million people who visit the park yearly. About 15 million individual visits are made each year. Summer is the season for softball, concerts, and Shakespeare; fall is stunning; winter is wonderful for sledding, skating, and skiing; and springtime is the loveliest of all. It was all planned that way. About 130 years ago Frederic Law Olmsted and his collaborator Calvert Vaux submitted their landscaping plan for a rectangular parcel two miles north of the town's center. The barren swampy tract, home for squatters and a bone-boiling works that made glue, was reported as 'a pestilential spot where miasmatic odors taint every breath of air. It took 16 years for workers with pickaxes and shovels to move 5 million cubic feet of earth and rock, and to plant half a million trees and shrubs, making a tribute to nature—a romantic nineteenth-century perception of nature. What exists today is essentially Olmsted and Vaux's plan with more trees, buildings, and asphalt. Landscape architects still speak reverently of Olmsted's genius and foresight, and the sensitive visitor can see the effects he sought.

- (I) According to the passage, which is the prettiest time of year in Central Park?
(A) Winter (B) Spring (C) Summer (D) Fall
- (II) It can be inferred that the rectangular parcel mentioned in line 7 is
(A) the site of Central Park (B) a gift presented to New York
(C) a skyscraper in New York (D) the proposed design for Central Park
- (III) According to the passage, before Olmsted and Vaux began their work, the area now occupied by Central Park was
(A) a romantic place (B) an infertile, marshy space
(C) a green and hilly park (D) a baseball field
- (IV) It can be inferred from the passage that today's landscape architects praise Olmsted for his
(A) enthusiasm for sport
(B) skill at designing factories
(C) concern for New York's homeless people
(D) foresight in anticipating New York's urbanization

2. Transform the following sentences according to the instruction (0.5 x 6 = 3)

- (a) We should pay more attention to our study. (Imperative)
- (b) He is not an irresponsible boy. (Interrogative)
- (c) I could not catch the bus. (Affirmative)
- (d) As soon as I entered the classroom the examination began. (Negative)
- (e) Everybody has heard of Gandhi. (Interrogative)
- (f) It was an amazing catch. (Exclamatory)

3. Use necessary articles (put cross mark if not needed). (0.5 x 6 = 3)

Ms Smith, (a) ___ most famous lady detective of (b) ___ twenty-first century, was born in (c) ___ United Kingdom in (d) ___ 1960s. Since then, she has been to many countries, including (e) ___ Portugal, Singapore and Australia, and has lived on (f) ___ equator.

4. Use necessary prepositions (0.5 x 8 = 4)

- (a) I asked the policeman some information.
- (b) The great player hit the ball the net.
- (c) Can you find our holiday beach the map?
- (d) Please turn the volume of the radio. I'm getting deaf.
- (e) The flight Leipzig London was via Frankfurt.
- (f) to the Headmaster, both of the boys got involved in the fight
- (g) the day, the rain came into the window.

5. Use right form of tense (0.5 x 6 = 3)

- (a) I (take) French lesson on every Thursday.
- (b) Currently, I (study) Development Studies at University.
- (c) I (be) to the US several times.
- (d) My parents never (eat) Sushi.
- (e) Recently, I (think) a lot about the political violence of our country.
- (f) I could not receive your phone because I (take) a shower when you called.

6. Write six separate sentences with any 3 pairs of words (0.5 x 6 = 3)

- | | |
|----------------------------|---------------------|
| (a) bored, board | (b) night, knight |
| (c) compliment, complement | (d) descent, decent |

University of Asia Pacific
Department of Basic Sciences and Humanities
Mid-Semester Examination Fall – 2017
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) Prove that work done per unit volume, $w = \frac{1}{2}$ x stress x strain for shearing strain energy. [10]
- (b) A steel wire 8 m long and 4 mm in diameter is fixed to two rigid supports. Calculate the increase in tension when the temperature falls by 10°C. [10]
2. (a) What is called Cantilever? Prove that depression $y = \frac{WL^3}{3YI_g}$ at the free end of the cantilever, where the terms have their usual meanings. [10]
- (b) A uniform rod of length 1 m is clamped horizontally at one end. A weight of 0.1 kg is attached at the free end. Calculate the depression at the midpoint of the rod. The diameter of the rod is 0.02 m. ($Y=10^{10}$ n/m²) [10]
3. Define elastic fatigue? State and explain stress-strain diagram of a metallic wire. [20]
4. (a) State and explain the Bernoulli's theorem and prove that $\frac{v^2}{2} + gh + \frac{p}{\rho} = \text{Constant}$, where the terms have their meanings. [10]
- (b) Two equal drops of water (surface tension T), each of radius r, are falling through air (viscosity η) with a steady velocity v. If the two drops coalesce to form a bigger drop, (i) compute the energy released and (ii) find the new velocity of fall. [10]

University of Asia Pacific
Department of Basic Sciences & Humanities
Mid Examination, Fall-2017
Program: B.Sc. in Civil Engineering

Course Title: Mathematics I
Time: 1.00 Hour

Course Code: MTH 101

Credit: 3.00
Full Marks: 60

There are **Four** questions. Answer any **Three**. All questions are of equal values, indicated in the right margin.

1. Define Continuity of a function. Prove that the function 20
$$f(x) = \begin{cases} 3+2x & \text{if } -3/2 < x \leq 0 \\ 3-2x & \text{if } 0 < x < 3/2 \end{cases}$$
 is continuous at $x = 0$ but not differentiable at $x = 0$.

2. (a) State Leibnitz's Theorem. If $y = e^{\cos^{-1} x}$, then show that 12
$$(1-x^2)y_{n+2} - (2n+1)xy_{n+1} - (n^2+a^2)y_n = 0.$$

(b) Discuss the applicability of the Rolle's theorem for the function 8
$$f(x) = x^2 - 6x + 8$$
 over $(2, 4)$.

3. (a) Find $\lim_{x \rightarrow 0} \frac{x - \sin^{-1} x}{\sin^3 x}$ 7
(b) Find for what values of x , $f(x) = 2x^3 - 21x^2 + 36x - 20$ is maximum and 13
minimum respectively. Find also the maximum and minimum value.

4. State Maclaurin's theorem. Expand $\ln(1+x)$ in power of x with remainders R_n in 20
Lagrange's and Cauchy's form.

University of Asia Pacific
Department of Civil Engineering
Midterm Examination Fall 2017
Program: B.Sc. Engineering (Civil)

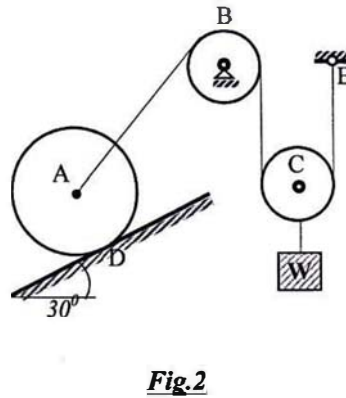
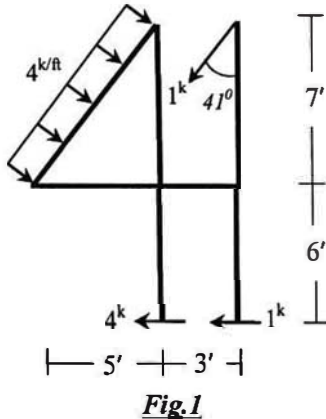
Course Title: Engineering Mechanics I
 Time: 1 hour

Credit Hour : 3.0

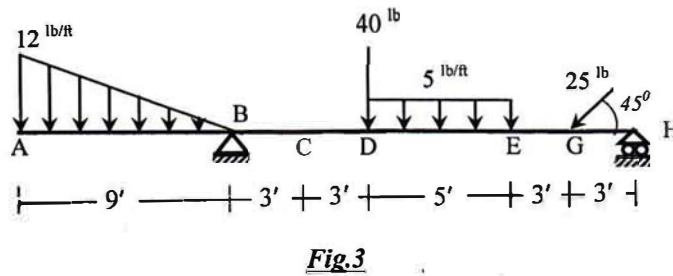
Course Code: CE 101
 Full Marks: 4 x 10

ANSWER ALL QUESTIONS. *The figures are not drawn to scale. Any missing data can be assumed reasonably.*

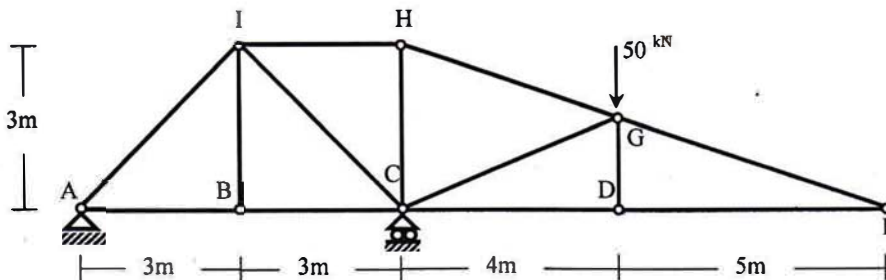
1. **Fig.1** shows a system of forces acting on a structure. Calculate the magnitude, direction and location of resultant of the forces.



2. **Fig.2** shows a pulley system where sphere A is connected by a cable. If the Sphere A is in equilibrium condition, calculate the weight of block W. Also calculate normal reaction at point D [Given: Weight of sphere A = 500 lb, Pulley B and Pulley C are smooth].
3. In the beam loaded as shown in **Fig.3**, calculate the i) reactions at supports B and H and ii) shear force and bending moment at point C.



4. **Fig.4** shows a truss system. Calculate i) the reaction at A and B and ii) forces in member BC, IC and CG.



University of Asia Pacific
Department of Civil Engineering
Mid Semester Examination Fall 2017
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

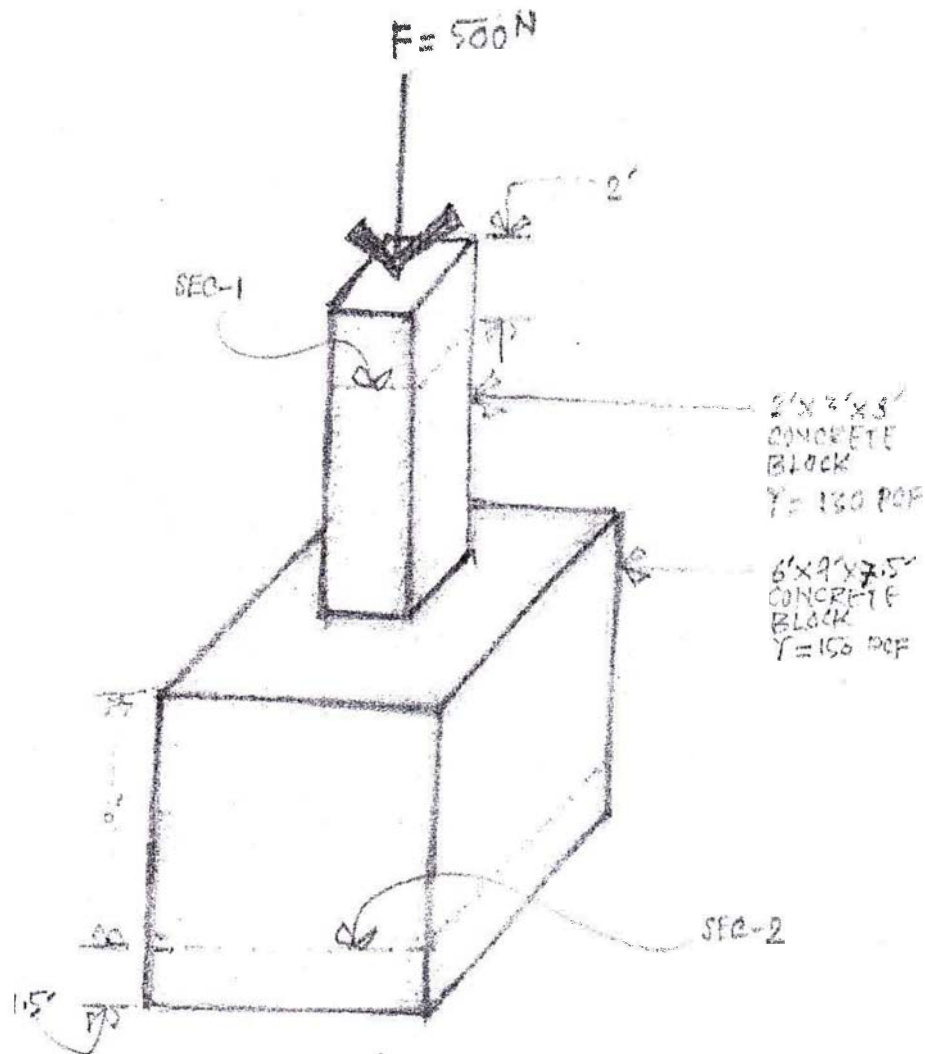
There are **THREE** questions. Answer any **TWO**.
[Assume reasonable value of missing data (if any)]

1. (a) Define the term *Environment* according to P. Gisbert. [5]
(b) What do you mean by *Fundamental of Environmental Engineering* and *Fundamental of Environmental Pollution*? [10]
2. (a) Listed ten different types of recent global environmental issues. [5]
(b) Explain the concept of Green Engineering. How Green Engineering Process differentiate from Traditional Engineering Process. [10]
3. (a) Show the distribution of world total water resource using pie charts. [5]
(b) Define *Environmental Ethics*. What are the common principles of *Environmental Ethics*? [10]

PART II

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

4. (a) Mention few simple points (at least two for each) related to the understanding of science, engineering and technology. [6]
(b) Unit weight of water is 9.81 kN/m^3 . Convert (showing unit detail) water's unit weight from this unit expression into lb/ft^3 , gm/cm^3 and kg/m^3 . [7]
(c) What should be the major foci of any civil engineering project? [2]
5. (a) Discuss, in brief, about civil engineering. [6]
(b) What are the major divisions of civil engineering? Also mention the names of some other participatory inevitable sub-fields that are involved in any civil engineering project. [2]
(c) According to a broader interdisciplinary approach mention the people that civil engineers have to interact with. [2]
(d) Calculate (showing unit detail) the weight of a brick (W_b) in kg, lb and gm if its size is about $241.3 \text{ mm} \times 11.43 \text{ cm} \times 2.75 \text{ in}$. Consider $\gamma_{bn} = 122.5 \text{ lb/ft}^3$. [5]



6. (a) At sections SEC-1 and SEC-2 as shown in the above figure depicting a concrete block system, calculate (showing unit detail) the total stresses (due to induced load of 50 N and self-weight of concrete) in lb/in^2 (psi) and N/mm^2 . [10]
- (b) Discuss, in short, "Civil Engineering" as a career. [5]