

THE HONG KONG POLYTECHNIC UNIVERSITY
HONG KONG COMMUNITY COLLEGE

Subject Title : Engineering Mechanics I

Subject Code : CCN2251

Session : Semester One, 2016/17

Numerical Answers

Question 1

- (a) $\vec{F} = (50\vec{i} + 30\sqrt{3}\vec{j})\text{N}$; $\vec{M}_A = 2.99 \text{ N} \cdot \text{m} \vec{N}$
(b) 5.75 cm right to A; 5.98 cm below A
(c) $\bar{X} = 11.1 \text{ cm}$; $\bar{Y} = 13.9 \text{ cm}$
(d) $1.27 \times 10^{-3} \text{ m}^4$

Question 2

- (b) 520 N \uparrow and 77.8 N \rightarrow ; 261 N \rightarrow
(c) 0.150
(d) 171 N

Question 3

- (a) 48.1 MPa
(b) 24.1 MPa

Question 4

- (a)
 $F_{AB} = F_{CD} = -\frac{5P}{8}$; $F_{BE} = F_{CE} = +\frac{5P}{8}$
 $F_{AE} = F_{DE} = +\frac{3P}{8}$; $F_{BC} = -\frac{3P}{4}$
(b) 137 kN
(c) 0.380 mm

Question 5

- (b) 4060 mm⁴
(c) 56.0 MPa; 66.4 MPa

Question 6

- (a) 7.99 m/s
(b) 3.82 m

(c) 1.95 m

Question 7

(b) 3.29 m/s

(c) 1.53 m