PHYS 250 Test 2 Ch4-5 Photo Upload

David Yang

TOTAL POINTS

70 / 100

QUESTION 1

1 8 / 20

    + 20 pts Correct

    ✓ **+ 6 pts** n and w included on FBD

    ✓ **+ 2 pts** Correct subscripts on FBDs

    - 3 pts Extra force on FBD that isn't drag, friction, or engine force

    + 8 pts Applied N's Second Law

    + 4 pts Solved for n

    - 1 pts Minor calculation error

    + 4 pts You found Fnet, but normal force is not equal to Fnet.

    1 accel and velocity are different things

QUESTION 2

2 20 / 20

    ✓ **+ 20 pts** Correct

    + 6 pts Correct FBD

    + 6 pts Tilted coords and correct components of w

    + 6 pts Applied N's Second

    + 2 pts Correct answer

    + 0 pts Static friction is not always at its maximum value

    2 justify next time please

QUESTION 3

3 42 / 60

    + 20 pts a) Correct

    + 12 pts b) Correct
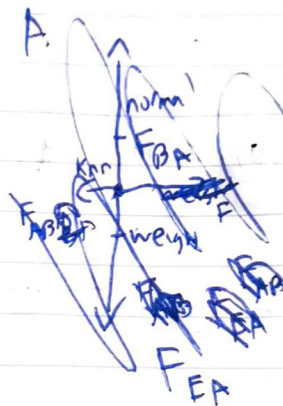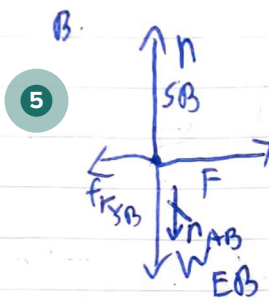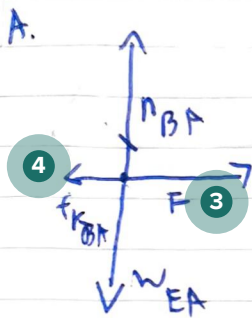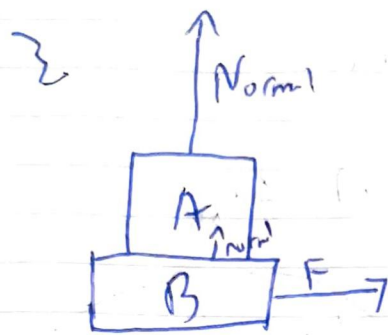
    + 8 pts c) Correct

    + 20 pts d) Correct

    + 17 pts d) correct except missing f_kAB

    - 1 pts Minor calculation or algebra error

    + 42 Point adjustment

    💬

a) 16/20, b) 8/12, c) 5/8, d) 13/20

3 F doesn't act on A (-1)

4 wrong way (-1.5)

5 Also f_k_AB (-1.5)

6 You're missing all the negatives. (-4)

7 where is 4 from?

8 justify the number 12 here

ξ

Normal

A

normal

B   F →

FBDs:

A.

n_{BA}

$f_{k_{BA}}$ F →

w_{EA}

B.

n
SB

$f_{k_{SB}}$ F →

n_{AB}
w_{EB}

A.

normal
F_{BA}

F_{ABS} weigh   F

F_{EA}

B.

norm
F_{SB}

FBS F_{EB}

b.

$F_{BA} + F_{BA} = ma$

$n_{BA} + w_{EA} = m_A \cdot a_y$

$F + f_{k_{BA}} = m_A \cdot a_x$

$n_{AB} + n_{SB} + w_{EB} = m_B \cdot a_y$

for both box a

and box b.

$F + f_{k_{SB}} = m_B \cdot a_x$

c.

$3 \cdot a_y = n_{BA} + w_{EA}$

$a_y = 0$

$3 \cdot a_x = F + f_{k_{BA}}$

$a_x = \dfrac{40 - 4}{3}$

$a_x = 12 m/s^2$

d. $4 \cdot a_y = n_{AB} + n_{SB} + w_{EB}$

$a_y = 0$

$4 \cdot a_x = F + f_{k_{SB}}$

$a_y = \dfrac{40 - 8}{4} = 7 m/s^2$

1 8 / 20

    + 20 pts Correct

✓ **+ 6 pts** n and w included on FBD

✓ **+ 2 pts** Correct subscripts on FBDs

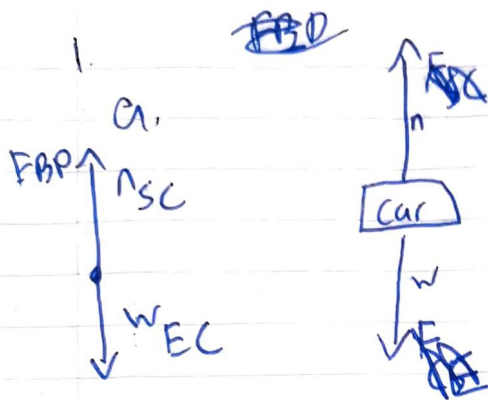   **- 3 pts** Extra force on FBD that isn't drag, friction, or engine force

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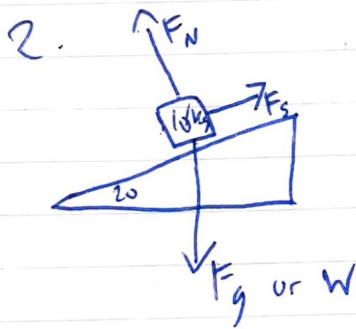
1 accel and velocity are different things

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1.

FBD

a.

FBP ↑ ↑ n_{SC}

↓ w_{EC}

n

| car |

↓ w

b. The car is on a flat surface of the valley.

Since $F_{net} = m \cdot a$

$a = 30 m/s$ and $m = 1000 kg$

$F_{net} = 30,000$ N

2.

↑ F_N

| 10kg | ↗ F_S

20°

↓ F_g or W

$F_g = 10 kg \cdot 9.8 = 98 N$

FBD

↖ F_N ↗ F_S

↙ w_x ↘ w_y
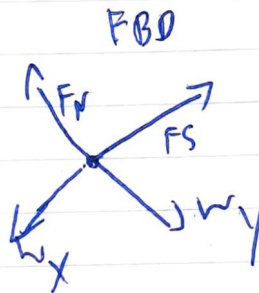
$w_x = W \sin 20°$

$w_y = W \cdot \cos(20°)$

$F_S = w_x$

Therefore $F_S = 33.517$

2 20 / 20

✓ **+ 20 pts** Correct
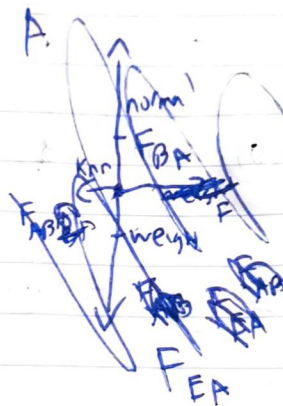
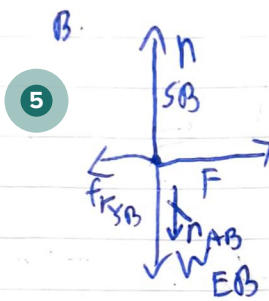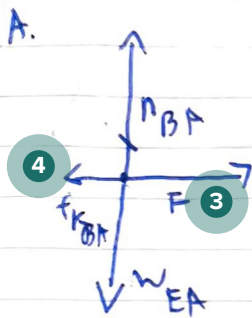   + **6 pts** Correct FBD
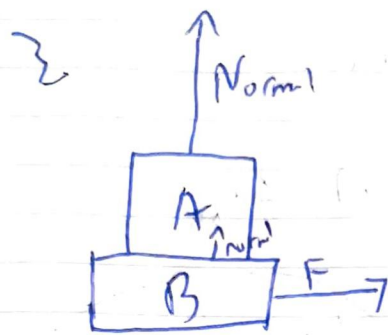
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    + **2 pts** Correct answer

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gradescope

2

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n norm

B   F →

FBDs

A.

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$f_{k_{BA}}$ F →

w_{EA}

B.

n
SB

$f_{k_{SB}}$ F →
n_{AB}
w_{EB}

A.

norm
F_{BA}
f_{kn}
F_{ABS} w_{EA} F

F_{EA}

B.

norm
SB
f_{kn}
FBS F_{EB}

b.

$F_{BA} + F_{BA} = ma$

$n_{BA} + w_{EA} = m_A \cdot a_y$

$F + f_{k_{BA}} = m_A \cdot a_x$

$n_{AB} + n_{SB} + w_{EB} = m_B \cdot a_y$

for both boxes a

$F + f_{k_{SB}} = m_B \cdot a_x$

c.

$3 \cdot a_y = n_{BA} + w_{EA}$

B $a_y = 0$

$3 \cdot a_x = F + f_{k_{BA}}$

$a_x = \dfrac{40 - 4}{3}$

$a_x = 12 m/s^2$

d.

$4 \cdot a_y = n_{AB} + n_{SB} + w_{EB}$

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+ **12 pts** b) Correct

+ **8 pts** c) Correct

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- **1 pts** Minor calculation or algebra error

+ **42** Point adjustment

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