IE5 Mechanical Science

ME 103	Engineering Mechanics (Mechanical)

CE 112 Engineering Mechanics+ ME 301 Applied Mathematics (Civil)
CE 104 Fluid Dynamics
CE 105 Hydraulic
CE 106 Hydrology
ME 201 Introduction to Fluid Mechanics
ME102 Engineering Thermodynamics

Part 1 Lesson

TUTORING LESSONS

EE204 Part 1 EE204 Part 2 EE204 Part 3 EE204 Part 4 EE204 Part 5

EE204 Part 6

Test & Assessment

http://www.filefactory.com/file/13o82qnudgr3/n/E046_Online_Test_1_Question_pdf

http://www.filefactory.com/file/6o2lsbtge7tt/n/E046_Online_Test_1_Answer_doc

SUBMIT THE SCANNED COPY OF ANSWER to

Dr Kyaw Naing
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Marrickville, NSW 1475, Sydney, Australia

Password- **iqytechnicalcollege**

Then do the following test. Download from the given link

E046 Online Test

Ref66

The car is driven along a straight road for 8.4 Km at 70 Km/ hr. At which point the truck runs off the gasoline & stops. The next 30 minutes, the driver walks along the road for another 3 Km.

(a) What is over all displacement?

(b)What is time interval from the beginning of the drive to arrival at the station?

(c)What is average velocity?

A	20 km, 1 HR, 20 km/hr	B	30 km, 2 HR, 30 km /hr
C	10.4 km, 0.62 HR, 16.8 km/hr	D	50 km, 5 HR, 70 km/hr
	Answer		

Ref70

On a hot day in Las Vegas, an oil tanker loaded 37000 L of diesel fuel. It encounters cold weather on Utah where temperature was 23 Degree K lower than in Las Vegas. How many litres did it deliver? Volume expansion for diesel fuel is 9.5×10^{-4} / Deg C coefficient of linear expansion is 11×10^{-6} /deg c

A	18380 L	B	36190 L
C	20000 L	D	10000 L
	Answer		

Ref73

A cylinder contains 12 L of oxygen at 20 deg C and 15 atm. The temperature is raised to 35 deg C and the volume is reduced to 8.5L . What is the final pressure of the gas in atmosphere.?

A	22 atm	B	33 atm
C	11 atm	D	44 atm
	Answer		

Ref76

Three Carnot engines operate between reservoir temperatures of (a) 400 deg K and 500 deg K (b) 600 and 800 deg K (c) 400 and 600 deg K. rank the engineers according to thermal efficiencies. Greatest first.

A	c, b, a	B	a, b, c
C	b, c, a	D	Equal
	Answer		

Ref79

At t= 0, the displacement X(0) of the block is – 8.5 cm. The block's velocity V(0) is -0.92 m/ s and it's acceleration a (0) is 47 $m/s^{2.}$

(a) What is the angular velocity w of this system?

(b) What are the phase constant ϕ and amplitude Xm ?

A	22.5 rad/ s, 155 deg, 9.4 cm	B	50 rad/ s, 30 deg, 18 cm
C	100 rad/ s, 45 deg, 10 m	D	15 rad/ s, 75 deg, 4cm
	Answer		

Ref82

The following equations give the position X (t) of a particle in four situations
(a) X = 8t-4 (b) x= $-6t^3+9t^2+6$ (c) X = $3 / t^2 - 9/ t$ (d) X = $7 t^2 -4$ To which of these situations? Do the constant acceleration formulae apply?

A	a	B	b
C	c	D	d
	Answer		

Ref85
a = 3 I – 8 j b = -2 I + 4 j c = - 4 j
Find the resultant vector for a+b+c

A	10i+2j	B	7i+5j
C	2.5i – 2.3 j	D	0
	Answer		

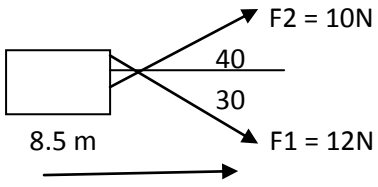
Ref88
2 kg Tin is accelerated at 3m /s^2 in the direction shown by a over a frictionless horizontal surface. The acceleration is caused by three forces . What is the third force?

A	20N	B	10N
C	1N	D	12.5N
	Answer		

Ref91
Suppose that the coefficient of static friction μ between the rider's clothing and the canvas is 0.4 and the cylinder radius " R" is 2.1 m.
(a) What minimum speed (V) must the cylinder and the rider have if the rider is not to fall when the floor drops? (b) If the rider's mass is 49 Kg, what is the magnitude of centrifugal force on rider?

A	7.2 m/s, 1200N	B	3.6 m/s, 600N
C	21 m/s, 2000N	D	30 m/s, 3000N
	Answer		

Ref94

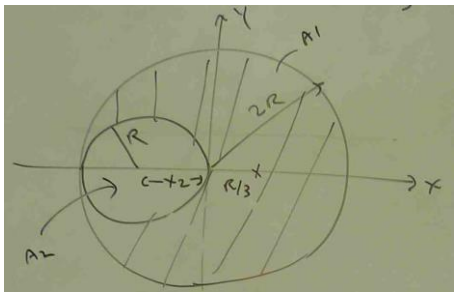


Find total work done of the forces.

A	306J	B	153J
C	469J	D	73J
	Answer		

Ref97

The figure shows a uniform metal plate " P " of radius " 2 R " from which a disk of radius "R" has been stamped out. Using the X-Y co-ordinate system shown, locate the centre of mass of the plate.



A	Xt = R / 4, Yt = R	B	Xt = R, Yt = R
C	Xt = R / 2, Y t = R/ 2	D	Xt = R / 3, Y t= 0
	Answer		

Ref100

A coach roach rides the rim of a rotating merry go around. If the angular speed is constant, does the coach roach have (a) Radial acceleration ? (b) Tangential acceleration ? What angle Θ_p should the arc subtend so that a 15. 4 kg at the point "P".

A	50 Deg	B	30 Deg
C	111 Deg	D	200 Deg
	Answer		

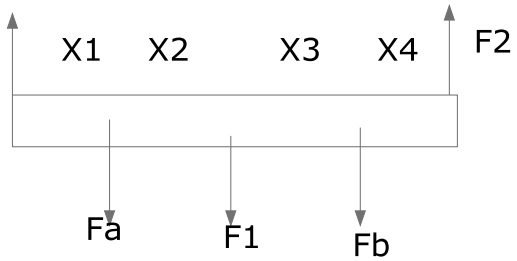
Ref67

A rolling object has linear velocity 342.5 m/s radius =3 m mass =170 kg Calculate total kinetic energy.

A	1.5×10^7 J	B	3×10^7 J
C	4.5×10^7 J	D	6×10^7 J
	Answer		

Ref68

The figure gives over view at a uniform rod in static equilibrium , the magnitude of the forces F1 & F2 are



X1= 4m, X2= 2m, X3=1m, X4 = 1m, Fa = 10 N ,Fb = 30N

A	90 N, 130 N	B	22.5 N, 32.5 N
C	45 N, 65 N	D	100 N, 200 N
	Answer		

Ref 69

A living room has the floor dimension and height of 3.5 m x 4.2 m. A height of 2.4 m (a) What does the air in the room weigh when the air pressure is 1 atm? (b) What is the magnitude of the atmosphere downward force on the top of your head which we take to have an area of $0.04m^2$

A	420 N, 4×10^3 N	B	840 N, 8×10^3 N
C	210 N, 2×10^3 N	D	1640 N, 6×10^3 N
	Answer		

Study ME 102 Powerpoints

ME102 Part 1

ME102 Part 2

Password- iqytechnicalcollege

Then do the following exercise

Study the notes in the YOC-ME102 folder & do the following exercises

Slide 1

Q1.What is thermodynamics system?
Slide 2+3
Q2.Explain the followings
(a) Property (b) Pressure (c) temperature (c) Internal Energy

Slide 4
Q3.Explain the followings
(a) Phase (b) Mixed phase (c) Saturated state (d) Superheated vapour

Slide 5
Q4.Describe the followings
(a) Adiabatic (b)Isothermal (c)Isobaric (d) Isochoric (d) Isentropic (e)Isenthalpic

Slide 6+7
Q5. Write the equation for ideal gas.

Slide 8
Q6.Write the gas equation.

Slide 9
Q7.Write the equation for (a) Constant volume (b) Constant pressure (c) Constant temperature.

Slide 10
Q8.Sketch the Pressure –Volume graphs for
(a) Adiabatic (b)Isothermal (c)Isobaric (d) Isochoric (d) Isentropic (e)Isenthalpic

Slide 11
Q9.Express Van der Waals gas equation of state for gas

Slide 12
Q10.Sketch temperature-enthalpy diagram for Ice, water, Water+ vapour , Vapour

Slide 14.
Q11.Write the equations to calculate steam properties in the mixed region.

Slide 15.
Q12. Write the heat, volume, density of steam equations.

Slide 16
Q13.Self ignition would occur in the engine using certain brand of petrol of the temperature due to compression reached 350 degree C. Calculate the highest ratio of compression that may be used to avoid pre-ignition if the law of compression is.

Slide 18
Q14. Calculate the density of Ethane at 171 bar and 458 deg K , assume for Ethane
T_e = 305K P_e= 48.80 bar R = 319.3 J / Kg K assuming it behaves as a perfect gas.

Slide 21
Q16. Determine the pressure of water vapour at 300 Deg C , if it's specific volume is 0.2579 m_3/ kg using the following methods.

(a) Ideal gas equation (b) Van der Waals equation.

ME 201 Introduction to Fluid Mechanics (Needs to do)

TUTORING LESSONS

ME201 Part 1

ME201 Part 2

ME201 Part 3

Wk 1- ME 201Introduction to Fluid Mechanics Part 1

Study the notes in ME201 Part 1 folder and do the following exercises.

Slide 1

Q1.Describe the nature of fluid.

Slide 2

Q2. Write continuum equation of fluid.

Slide 3

Q3.What are the properties of fluids

Q4. What is density?

Slide 5

Q5.What is viscosity?

Slide 6 to 8

Q6.Write the equation for viscosity.

Slide 9 to 11

Q7.Explain surface tension & write the equation.

Slide 12

Q8.What is compressibility?

Slide 13.

Q9. Outline the broad classification of fluid mechanic.

Slide 14.

Q10.Explain fluid statistics.

Slide 15 to 17

Q11.Write the equation for pressure.

Slide 18

Q12.Show pressure variation in the direction of gravity.

Slide 19

Q13.Define the followings.

(a) Pressure (b) Head

Slide 20

Q14.Explain measurement of pressure.

Wk 3-ME 204 Engineering Fluid Mechanics

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ME 301 Fluid Dynamics (Needs to do)

TUTORING LESSONS

ME204

Study ME 301 folder & do the exercises

Slide 1

Q1. What kind of forces are acting on fluid particles?

Slide 2

Q2.Write the equation for compressible flow.

Slide 3

Q3. Express Navier Stokes equation and energy equation.

Slide 4

Q4.Write the equation for dissipation function.

Slide 5

Q5. Write the equation for incompressible flow.

Slide 6 to 8

Q6.Explain turbulent flow with diagram and express the graphs for instantaneous and average velocities.

Slide 9

Q7.Explain inviscid flow

Slide 10.

Q8.Explain boundary layer

Part 2 References

ENMCC 101A Foundation Mechanical & Civil Engineering Principle

http://www.filefactory.com/file/3ksq7bl9inpf/RE011_pdf

CE 104 Fluid Dynamics

CE 105 Hydraulic

CE 106 Hydrology

Do the following to complete above units

ME201 Part 1 http://www.filefactory.com/file/23rjyg1cx50j/n/ME201_Part_1_zip
ME201 Part 2
http://www.filefactory.com/file/3fepjr47o1wz/n/ME201_Part_2_zip
Password--- iqytechnicalcollege
ME201 Part 3
http://www.filefactory.com/file/5sct05zqfui3/n/ME201_Part_3_zip

Password--- iqytechnicalcollege

Study the notes in ME201 Part 1 folder and do the following exercises.

Slide 1

Q1.Describe the nature of fluid.

Slide 2

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Slide 3

Q3.What are the properties of fluids

Q4. What is density?

Slide 5

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Slide 6 to 8

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-ME 204 Engineering Fluid Mechanics

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ME 301 Fluid Dynamics

ME204

http://www.filefactory.com/file/343m93h33fl3/n/ME204_zip

ME 204 Engineering Fluid Mechanics.pdf (5.65MB)

http://www.filefactory.com/file/5sjox20t560f/n/ME_204_Engineering_Fluid_Mechanics.pdf

ME 301 Fluid Dynamics.pdf (3.72MB)

http://www.filefactory.com/file/10i3ovznbs3t/n/ME_301_Fluid_Dynamics.pdf

ME 201Introduction to Fluid Mechanics.pdf (8.5MB)

http://www.filefactory.com/file/2v3h92glcy9/n/ME_201Introduction_to_Fluid_Mechanics.pdf

ME 101 applied-mathematics-by-example-theory.pdf (4.17MB)

http://www.filefactory.com/file/2zucdw4z05ej/n/ME_101_applied-mathematics-by-example-theory.pdf

ME 101 Applied-mathematics-by-example-exercises.pdf (3.64MB)

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