IES COLLEGE OF TECHNOLOGY, BHOPAL
M.E./ M.Tech.(1ᵗʰ SEM) Assignment -1
Advanced Mathematics (MPTP-101)

Date of Assignment: 10/10/15   Date of Submission:26/10/2015

Note: 1.Question should be written in plain A-4 Size Paper.
      2. Minimum 300 Word Limit for each Question.
      3. Assignment will submit in stick file.

1	Define vector space and show that the set of all matrics of order 2×2 is vector space with respect to matrix addition and scalar multiplication.	4
2	Show that mapping $f:v_3(r) \to v_2(R)$ defined by $f(a,b,c) = (a,b)$ is linear transformation. What is kernel of this transformation?	4
3	Solve the poison's equation $\frac{d^2y}{dx^2}\frac{d^2y}{dy^2} = -10(x^2 + y^2 + 10)$ over sides x=y=0, x=y=3 with 4(x,y)=0 on the boundary and mesh length L=1.	4
4	Find the solution of the one dimensional heat equation by variable separable method.	4

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Thermodynamics and Combustion (MPTP-102)

Date of Assignment: 10/10/15   Date of Submission: 26/10/2015

Note: Minimum 300 Word Limit for each Question.

1	Define first and second law of thermodynamics?(june-2013)
2	Explain with simple sketch, thermodynamics system ,closed, open, adiabatic, isolated? (june-2013)
3	2kg of air at 6.86bar at absolute and 90⁰C pass through a reversible non flow polytrophic process represented by $PV^{1.1}$=Constant. Till the pressure falls to 1.37bar. Calculate: a)The final temperature specific volume and change in entropy? b) work and heat transfer? (dec-2014)
4	Define phase and reaction equilibrium?(dec-2013)

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Heat and Mass Transfer (MPTP-103)

Date of Assignment: 10/10/15   Date of Submission: 26/10/2015

Note: Minimum 300 Word Limit for each Question

1	Defines modes of heat transfer.also descibe the mechanism of heat transfer in detail. (dec-2009,11)	4
2	Define the governing equation in luminar and turbulent flow. (dec-2009,10)	4
3	Define the free and foxed convention. (dec-2010,12)	4
4	What is the steady state conduction.(dec-2013,14)	4
5	What is nature of vaporization? (dec-2014)	4

IES COLLEGE OF TECHNOLOGY, BHOPAL
M.E./ M.Tech.(1th SEM) Assignment -1
Advanced thick Mechanics (MPTP-104)

Date of Assignment: 10/10/15   Date of Submission: 26/10/2015
Note: Minimum 300 Word Limit for each Question

1	State and prove the Pascal's law. (June-2010)	4
2	Define Newton's law of viscosity. Explain the importance of viscosity in fluid motion.(Dec-2011)	4
3	Derive Reynolds's transport theorem and write its applications.(June 2011)	4

4	Differentiate between (June 2012)
	
	    a. Steady and unsteady flow.
	
	    b. Uniform and non-uniform flow.
		4

5	What is the flow net? Enumerate the method of drawing flow net. (Dec-2013)	4

IES COLLEGE OF TECHNOLOGY, BHOPAL
M.E./ M.Tech.(1th SEM) Assignment -1
IC Engine alternate flow (MPTP-105)

Date of Assignment: 10/10/15   Date of Submission: 26/10/2015   Note: Minimum 300 Word Limit for each Question

1.	What is the significance of the ASTM distillation curve?(JUNE-2013)	4
2.	Explain the difference between the continuous injection and pulsed injection?(DEC - 2012)	4
3.	What is the generalized performance map of IC engine.(DEC-2013)	4
4.	What is duel fuel Engine? (JUNE-2014)	4
5.	A four cylinder four stroke SI engine has a compression ratio of θ and bore of 100 mm. with the stroke equal to 75%. The engine operate at a speed of 4000 rpm with an air fuel ratio is 15. Given that Cabrific value of fuel=42MJ/kg Atmosphere density=1.12kg/m^3 Mep in cylinder=10 bar, η_{melh}=80%. Determine the indicated thermal η and brake power. JUNE-2014	4