

**IES GROUP OF INSTITUTION BHOPAL**

**Mechanical Engineering Branch**

*BE third Semester*

*MATHEMATICS-2 (BE-301)*

*ASSIGNMENT-1*

*Date of submission: 24/7/2014*

1	Find the Laplace transform of $te^{-2t}\sin 2t$	2008
2	Solve the equation by the transform method: $d^2y/dt^2 - 3dy/dt + 2y = 4t + e^{3t}$ when $y(0) = 1$ and $y'(0) = -1$	2010
3	Find the Inverse Laplace Transform of $1/s^3 - a^3$	2007
4	Find the Laplace Transform of $t^2\sin at$ .	2008
5	Solve the equation by the transform method: $d^2y/dt^2 - 3dy/dt + 2y = 4t + e^{3t}$ when $y(0) = 1$ and $y'(0) = -1$	2008

**IES GROUP OF INSTITUTION BHOPAL**

**Mechanical Engineering Branch**

*BE third Semester*

*Production process (ME-302)*

*ASSIGNMENT-1*

*Date of issue: 16/7/2014*

*Date of submission: 24/7/2014*

1.	Define orthogonal and oblique cutting.	
2	Make a neat sketch to show tool nomenclature and tool angle of a single point cutting tool.	
3.	Explain types of chips and Derive an expression to determine the shear angle in a metal machining. Also define MRR.	
4	What do you understand by tool life and tool wear.	
5	The useful tool life of H.S.S tool machining M.S. at 18 m/min. is 3 hours . Calculate the tool life when the tool operates at 24 m/min.	

**IES GROUP OF INSTITUTIONS BHOPAL**  
**ASSINMENT UNIT-I-ME-303-SOM**

Date of issue: 16/7/2014

Date of submission: 24/7/2014

Q-1	A load of 270 KN is acting on a short RCC column of size 200 mm ×200 mm. The column is reinforced with 10 bars of 12 mm diameter. Find the stresses in steel and concrete, if the modulus of elasticity of steel is 16.5 times of that of concrete ?	
Q-2	A rectangular block of material is subjected to a tensile stress of $100\text{N/mm}^2$ on one plane and a compressive stress of $50\text{N/mm}^2$ on a plane at right angle, together with shear stresses of $60\text{N/mm}^2$ on the faces .Find  (i) The direction of principal planes.  (ii) The magnitude of principal stresses.  (iii) The magnitude of greatest shear stress.  (iv) The location of plane containing maximum shear stress.	
Q-3	What are the assumptions made in the theory of pure torsion ? Also prove the torsion formula ?	
Q-4	<b>Q-5</b> A cylindrical shell made of mild steel plate and 1.50 m im diameter is to be subjected to an internal pressure of 1.80 MPa. If the yields point stress at 200 MPa, calculate the thickness of the plate. By using (i) Maximum principal stress theory (ii) Maximum shear stress theory (iii) Maximum shear strain energy theory .	
Q-5	What are assumptions made in Euler's theory and prove that the Euler's formula when both ends fixed .	

# IES INSTITUTE OF TECHNOLOGY, BHOPAL

## DEPARTMENT OF MECHANICAL ENGINEERING

B. E. 3<sup>RD</sup> SEM

Subject: - Thermodynamics

Assignment I

Date of issue 16/7/2014

Date of submission 24/7/2016

Q No.	Question	Marks	Remarks
1.	Define a thermodynamic system. Differentiate between open system, closed system and an isolated system.	3	2008
2.	Explain the following terms : (i) State, (ii) Process, and (iii) Cycle.	2	2008
3.	Explain briefly zeroth law of thermodynamics and What is a quasi-static process ?	2	2009
4.	A vessel of cylindrical shape is 50 cm in diameter and 75 cm high. It contains 4 kg of a gas. The pressure measured with manometer indicates 620 mm of Hg above atmosphere when barometer reads 760 mm of Hg. Determine : (i) The absolute pressure of the gas in the vessel in bar. (ii) Specific volume and density of the gas.	7	2009
5.	Gas from a cylinder of compressed helium is used to inflate an inelastic flexible balloon, originally folded completely flat, to a volume 0.6 m <sup>3</sup> . If the barometer reads 760 mm Hg, what is the amount of work done upon the atmosphere by the balloon ? Sketch the system before and after the process.	7	2008
6.	A cylinder contains 1 kg of a certain fluid at an initial pressure of 20 bar. The fluid is allowed to expand reversibly behind a piston according to a law $PV^2 = \text{constant}$ until the volume is doubled. The fluid is then cooled reversibly at constant pressure until the piston regains its original position ; heat is then supplied reversibly with the piston firmly locked in position until the pressure rises to the original value of 20 bar. Calculate the net work done by the fluid, for an initial volume of 0.05 m <sup>3</sup> .	7	2010
7.	1000 kg of steam at a pressure of 16 bar and 0.9 dry is generated by a boiler per hour. The steam passes through a superheater via boiler stop valve where its temperature is raised to 380°C. If the temperature of feed water is 30°C, determine (i) The total heat supplied to feed water per hour to produce wet steam. (ii) The total heat absorbed per hour in the superheater. Take specific heat for superheated steam as 2.2 kJ/kg K.	7	2010

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**ASSIGNMENT 1**

**ME-305-MDD**

**Date of Assign: 16/07/14**

**Date of Submission.24/07/14**

Q-1	What do you understand by tolerance?	5
Q-2	Show Application of different type of line using a appropriate sketch?	5
Q-3	Discuss two method normally followed while dimensionally a drawing?	5
Q-4	Sketch the following welding symbols along with respective illustration: (i) Single V butt weld (ii) Fillet weld	5