

# **Sai Nath University**

## **Assignment For B.TECH in Mechanical Engineering I<sup>ST</sup> Sem.**

The Assignment will consist of two parts, A and B. Part A will have 5 short answer questions(40-60 words) of 4 marks each. Part B will have 2 long answer questions of 10 marks each

### **All questions are compulsory.**

These Assignments should be completed and submitted in written form by the student to his/her respective Faculty/ Examiners. Assignment Submission Dates are:

➤ Nov-17

### **List Of Suggested Questions**

The list of suggested questions are for students to practice. Although optional, we recommend that students solve these questions, as they will help them in preparing for exams as well as in clearing the important concepts of the subject.

### **List of Practical and suggested practical's**

The list of practical's should be done by the students in their Lab Sessions. These are the basic practical's, which each student should be able to do himself independently. While the list of suggested practicals are optional, but it is recommended that students should perform those practical so as to have a thorough knowledge of the subject

### **Education Delivery Schedule (EDS)**

As per University Semester scheme, the minimum contact hours of each paper has been Divided into two hours theory and practical class.

The faculty will maintain this attendance paper wise for his/her batch.

<b>Subject Code</b>	<b>Subject Name</b>
<b>BTME-101</b>	<b>Mathematics-I</b>
<b>BTME-102</b>	<b>Chemistry</b>
<b>BTME-103</b>	<b>English for communication</b>
<b>BTME-104</b>	<b>Electrical Technology</b>
<b>BTME-105</b>	<b>Mechanics</b>
<b>BTME-106</b>	<b>Introduction to Manufacturing Process</b>
<b>BTME-107</b>	<b>Practical Chemistry</b>
<b>BTME-108</b>	<b>Practical Mechanics</b>



## **SAI NATH UNIVERSITY**

### **Cover page of Assignment**

ID NUMBER .....

NAME .....

COURSE B.Tech.....

STREAM Mechanical.....

SEM .....

SUBJECT CODE .....

SUBJECT NAME .....

**Assignments will be completed by the Student in his/her own handwriting.**

# BTME-101

## Mathematics-I

### Part-A

1. If  $y = e^{ax} \sin(bx+c)$  then prove that  $y'' = (a^2 + b^2)y$  and  $y' = a \tan^{-1} \left( \frac{by + a}{ay - b} \right)$
2. Show that the radius of curvature at any point of the cycloid  $x = a(\theta + \sin \theta)$ ;  $y = a(1 - \cos \theta)$  is  $4a \cos(\theta/2)$
3. Show that the two curves  $r = a(1 + \cos \theta)$  and  $r = a(1 - \cos \theta)$  cut each other orthogonally.
4. Solve by LU decomposition method,  
 $3x + 2y + 7z = 4$   
 $2x + 3y + z = 5$   
 $3x + 4y + z = 7$ .
5. Reduce the quadratic form  $3x^2 + 5y^2 + 3z^2 - 2y^2 + 2zx - 2xy$  to the canonical form and specify the matrix of transformation.

### Part-B

6. If  $u = x + y + z$ ,  $uv = y + z$  and  $uvw = z$  then show that  $\frac{\partial(x, y, z)}{\partial(u, v, w)} = u^2v$ .
7. A particle moves along the curve  $x = (1 - t^3)$ ,  $y = (1 + t^2)$ ,  $z = (2t - 5)$  determine its velocity and acceleration. Also find the components of velocity and acceleration at  $t = 1$  in the direction of  $2\mathbf{i} + \mathbf{j} + 2\mathbf{k}$ .

**BTME-102****[Chemistry]****Part A**

1. Write about Characteristics of Corrosion.
2. What is polymer ?write the name of different type of polymers.
3. Write first and second law of thermodynamics?
4. What is pollution ? Describe about kind of pollution.
5. Write about types of impurity present in water?

**Part B**

1. What is semiconductor ? write about pentavalent and trivalent impurities.
2. What is lubricants? Classify the lubricants.

**BTME-103**  
**[English For Communication]**  
**Part A**

1. Write about nature of communication.
2. Write about types of communication.
3. Write about barriers of communication.
4. What is effective communication.
5. What is affirmative and negative sentences.

**Part B**

1. What are the ways by which we can remove barriers of communication?
2. What is psychological barrier

**BTME-104**  
**[Electrical Technology]**  
**Part A**

1. Write about Coulomb's law.
2. What is Faraday's law of electricity.
3. Write about primary cell and secondary cell.
4. What is Fleming's right hand rule and Lenz's law .
5. What is Electric charge, Electric current, E.M.F. and potential difference?

**Part B**

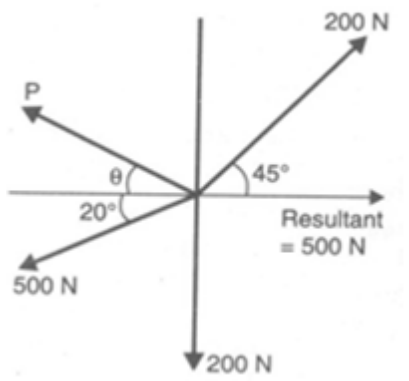
1. Write with neat sketch about Lead Acid Battery, Nickel Cadmium Cell .
2. Write about Alternating Current & Power in RC Circuit, Alternating Current & Power in RLC Series Circuit.

**BTME-105**  
**[Mechanics]**  
**Part A**

1. What is the principle of transmissibility?.
2. Locate the centroid of a semicircle of radius  $r$ .
3. State triangular law of forces. What is the use of this law?
4. State D'Alembert principle giving equations
5. Find the mass moment of inertia of a slender rod.

**Part B**

1. The four coplanar forces are acting at a point as shown in the fig. One of the forces is unknown and its magnitude is shown by  $P$ . The resultant is having a magnitude of 500N and acting along x-axis. Determine the unknown force  $P$  and its inclination with x-axis.



2. State and prove the parallel axis theorem.



**BTME-106****[Introduction To Manufacturing Process]****Part A**

- 1.What is milling cutter?
2. What is Lathe accessories ?
- 3.Write about application of broaching.
- 4.Write About gear finishing process.
5. What is pattern making and core making.

**Part B**

- 1.Write about arc welding . Give 5 difference between A.C. arc welding And D.C. arc Welding.
- 2.What is NC machines . Write about its classification.

**BTME-107**  
**[Practical Chemistry]**  
**Part A**

1. Determine the amount of Oxalic Acid and Sulphuric Acid/Hydrochloric Acid in one litre of solution given standard Sodium Hydroxide and Potassium Permanganate.
2. To determine the amount of Sodium Carbonate in the given mixture of Sodium.
3. Determine the amount of Cu in the copper ore solution provided hypo solution.
4. To determine the Carbonate, Bicarbonate and Chloride contents in irrigation water.
5. Determination of dissolved Oxygen in given sample of water.

**Part B**

1. Argentometric titration one each of Volhard's method and of Mohr's method.
2. What is Complexometric Titrations.

**BTME-108**  
**[Practical Mechanics]**  
**Part A**

1. Measure the amplitude of the pendulum for three different initial velocities of the shot ball.
2. State about parallel law of force.
3. Write Tringulur law of force.
4. Explain the concept of work? What are the units of work?
5. Compute the mass moment of inertia of a circular plate.?

**Part B**

1. Determine the second moment of an area of a right angled triangle with respect to its bace?
2. What is centroid of a (a) rectangle (b) triangle with respect to base (c) triangle with Respect to apex?