J S UNIVERSITY

ASSIGNMENT FOR B.TECH IN MECHANICAL 4TH SEM.

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

All questions are compulsory.

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

List Of Suggested Questions

The list of suggested questions is 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 practical's 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.

SUBJECT CODE	SUBJECT NAME
BTOE-49	Science Based Open Elective
BTEE-45	Electrical Machines & Controls
BTME-41	Applied Thermodynamics
BTME-42	Manufacturing Science & Technology-I
BTME-43	Measurement and Metrology
BTIS-41	Industrial Sociology
BTAC-41	Cyber security

SCIENCE BASED OPEN ELECTIVE

PART A

1. Explain Neuron, Nerve structure and synapse, Artificial Neuron and its model, activation functions, neural network architecture?

2. Explain various learning techniques; perception and convergence rule, Auto-associative and hetero-associative memory?

3. Architecture: Perceptron model, solution, single layer artificial neural network, multilayer perception model; back propagation learning methods?

4. Basic concepts of fuzzy logic, Fuzzy sets and Crisp sets, Fuzzy set theory and operations?

5. Basic concepts, working principle, procedures of GA, flow chart of GA, Genetic representations, (encoding) Initialization and selection, Genetic operators, Mutation, Generational Cycle, applications?

PART B

1. Properties of fuzzy sets, Fuzzy and Crisp relations, Fuzzy to Crisp conversion?

2. Effect of learning rule co-efficient ;back propagation algorithm, factors affecting back propagation training, applications?

ELECTRICAL MACHINES & CONTROLS

PART A

1. Efficiency Voltage regulation, O.C. & S.C. Tests?

2. Three phase transformer connections, 3-phase to 2-phase or 6-phaseconnections and their applications?

3. Concept of starting, speed control, losses and efficiency?

4. Starting , effect of excitation on line current (V-curves) synchronous condenser?

5. Open loop & closed loop controls, servo mechanisms; concept of various type's ?

PART B

1. Concept and types of stability, Routh hurwitz criterion and its application for determination ofstability, limitations; Polar plot, Nyquist stability Criterion and assessment of stability?

2. Concept of root locus, construction of root loci ?

APPLIED THERMODYNAMICS

PART A

1. Joule-Thompson coefficient and Inversion curve. Coefficient of volume expansion, Adiabatic and Isothermal compressibility?

2. Combustion analysis, heating values, air requirement, Air/Fuel ratio, standard heat of reaction and effect of temperature on standard heat of reaction?

3. Classifications and working of boilers, boiler mountings and accessories, Draught and its calculations, air pre heater, feed water heater, super heater. Boiler efficiency, Equivalent evaporation?

4. Carnot vapour power cycle, Rankine cycle, effect of pressure and temperature on Rankine cycle?

5. Flow through Convergent and convergent-divergent nozzles, variation of velocity, area and specific volume, Choked flow, throat area, Nozzle efficiency?

PART B

1. Classification of steam turbine, Impulse and Reaction turbines, Staging, Stage and Overall efficiency?

2. Gas turbine classification, Brayton cycle, Principles of gas turbine, Gas turbine cycles with inter -cooling?

MANUFACTURING SCIENCE & TECHNOLOGY-I

PART A

1. What is Importance of manufacturing. Economic & technological considerations in manufacturing.Classification of manufacturing processes?

2. Hot working versus cold working. Analysis (equilibrium equation method) of Forging process for loadestimation with sliding friction, sticking friction and mixed condition for slab and disc?

3. Condition for Rolling force and power in rolling. Rolling mills & rolled-sections?

4. Analysis of forming process like cup/deep drawing. Bending & spring-back?

5. Types of patterns and allowances. Types and properties of Moulding sand, sand testing?

PART B

1. Solidification of casting, Sand casting, defects & remedies and inspection of Cupola furnace ?

2. Die Casting, Centrifugal casting, Investment casting, Continuous casting, CO2casting and Stir castingetc?

MEASUREMENT AND METROLOGY

PART A

1. Introduction to measurement and measuring instruments, Generalized measuring system and functional elements, units of measurement?

2. Concept of error (systematic and random), sources of error, statistical analysis of errors?

3. Stroboscope, frequency measurement by direct comparison?

4. Types of strain gauges and their working, strain gauge circuits, temperature compensation?

5. Limit fits and tolerances. Interchangeability and standardization. Linear and angular measurements devices and systems Comparators: Sigma, Johansson's Mikrokator. Limit gauges classification, Taylor's Principle of Gauge Design?

PART B

1. Measurement of geometric forms like straightness, flatness, roundness?

2. How to measurement of screw threads and gears?

INDUSTRIAL SOCIOLOGY

PART A

1. Nature Scope and Importance of Industrial Sociology?

2. The domestic or putting-out system and the Factory system?

3. Industrial Policy Resolutions – 1956.Science.Technology and Innovation Policy of India 2013?

4. What is Grievances and Grievance handling Procedure?

5. What is Labour courts & Industrial Tribunals?

PART B

1. Causes and Consequences of Industrialization . Obstacles to and Limitations of Industrialization?

2. What is Obstacles to and Limitations of Industrialization?

CYBER SECURITY

PART A

1. Introduction to information systems, Types of information Systems?

2. Threats to Information Systems, Information Assurance, Cyber Security, and Security Risk Analysis?

3. Application security (Database, E-mail and Internet), Data Security Considerations-Backups?

4. Physical Security of IT Assets, Access Control, CCTV and intrusion Detection Systems, Backup SecurityMeasures?

5. Security Policies, Why Policies should be developed, WWW policies, Email Security policies?

PART B

1. What is IT Act, Copyright Act, Patent Law, IPR?

2. What is IT Act 2000 Provisions, Intellectual Property Law: Copy Right Law, Software License,Semiconductor Lawand Patent Law ?