

# **J.S University**

## **Assignment For B.TECH in electrical Engineering 6<sup>th</sup> Sem.**

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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:

### **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>BEE 1</b>	Power System Analysis
<b>BEE 2</b>	Switchgear & Protection
<b>BEE 3</b>	Special Electric Machine
<b>BEE 4</b>	Fundamentals of Digital Signal Processing
<b>BEE 5</b>	Conventional & CAD of Electrical Machines
<b>BEE 6</b>	Industrial Management
<b>BEE 7</b>	Minor Project
<b>BEE 8</b>	Seminar

# **J.S UNIVERSITY**

## **Cover page of Assignment**

ID NUMBER .....

NAME .....

COURSE B.TECH

STREAM ELECTRICAL.....

SEM 6<sup>th</sup> .....

SUBJECT CODE .....

SUBJECT NAME .....

## **ASSIGNMENT FOR B.TECH 6<sup>TH</sup> SEM ELECTRICAL ENGINEERING**

### **Power system-I**

#### **Part A**

1. Why do we use symmetrical components for the analysis of unsymmetrical faults?
2. What are current limiting reactors?
3. What are the characteristics of an IDMT relay?
4. Discuss the advantages of per unit system of analysing power system problems.
5. Derive the necessary equations to determine the fault current for a single line to ground fault. Draw a diagram showing the interconnection of sequence networks.

#### **Part B**

1. Classify the various types of overcurrent relays and give their application
2. A three phase, star connected load is connected across a 3 phase balanced supply system. Obtain a set of equations relating the symmetrical components of the line and phase voltages.
3. The line to line voltages of a 3 phase system measure 100, 150 and 200 volts. Find the magnitude of the positive negative and sequence components of the delta voltages and star voltages

## ASSIGNMENT FOR B.TECH 6<sup>TH</sup> SEM ELECTRICAL ENGINEERING

### Switchgear & Protection

#### Part A

1. Describe the construction and principle of operation of an induction type directional over-current relay.

2. Explain the principle of operation of an impedance relay with the help of its characteristic. Also draw a typical reactance relay

characteristics.

3. Draw a schematic diagram of a phase comparison that carries current protection and explain the function of each block/apparatus shown in the schematic diagram.

4. What is the effect of resistance in the star point earthing ?

5. Suggest a scheme for differential protection of a generator transformer unit. Draw and explain the scheme.

1. Explain the construction and working of vacuum and SF 6 circuit breaker .

2. What is meant by directional feature of a directional overcurrent relay ? Describe the construction and operation of a directional overcurrent relay.

## ASSIGNMENT FOR B.TECH 6<sup>TH</sup> SEM ELECTRICAL ENGINEERING

### Special Electric Machine

#### Part A

1. Explain how the flux in the transformer remains constant from no load to full load.
2. Q2. Draw and explain the phasor diagram of single phase transformer supplying lagging p.f load. Also discuss how the secondary leakage flux is accounted for in the phasor diagram.
3. Q3. A 6300/210V, 50 Hz single phase transformer has per turn emf of about 9 volts and maximum flux density of 1.2 T. Find the number of high voltage and low voltage turns and the net cross-sectional area of the core. [Ans. 720 turns, 24 turns, 328.3cm<sup>2</sup> ]
4. Q4. What is a leakage flux? How can leakage flux be minimized? Is it possible to have no leakage flux?
5. Q5. Explain why we prefer to perform open circuit test on l.v side and short circuit test on h.v side.'

#### Part B

6. Q6. Develop the exact equivalent circuit of a transformer. From this derive the approximate and simplified equivalent circuit of transformer.
7. Q7. What is the difference between no-load and on-load tap changers?

## ASSIGNMENT FOR B.TECH 6<sup>TH</sup> SEM ELECTRICAL ENGINEERING

### Fundamentals of Digital Signal Processing

#### Part A

- 1) Determine whether the following discrete-time signals are periodic, and if they are, specify the fundamental period.
  - a)  $x(n) = \cos(\pi n/2) \sin(\pi n/8) + 3\cos(\pi n/4 + \pi/3)$
  - b)  $x(n) = 3\cos(5n + \pi/6)$
- 2) An analog signal  $x_a(t) = \sin(480\pi t) + 3\sin(720\pi t)$  is sampled 600 times per second.
  - a) Determine the Nyquist sampling rate for  $x_a(t)$  and the folding frequency.
  - b) What are the frequencies, in radians, in the resulting discrete time signal  $x(n)$ ?
  - c) If  $x(n)$  is passed through an ideal D/A converter, what is the reconstructed signal  $y_a(t)$ ?
- 3) What is the benefits of digital signal processing ?
- 4) Write the properties of fourier transform?
- 5) (Marks = 4) Compute  $y(n)$  for an LTI system where the input and impulse response are given by a)  $x(n) = \{1, 2, -1\}$ ,  $h(n) = x(n)$ .  
b)  $h(n) = (1/2)^n u(n)$ ,  $x(n) = u(-n)$

#### part B

- 6) (Marks = 4)
  - a) Determine the range of values of the parameter  $a$  for which the LTI system with impulse response  $h(n)$  is stable. The impulse response is given as follows
$$h(n) = a^n, \quad n \geq 0, \text{ n even}$$
$$= 0, \quad \text{otherwise}$$
  - b) Three systems with impulse responses  $h_1(n) = \delta(n) \delta(n-1)$ ,  $h_2(n) = h(n)$  and  $h_3(n) = u(n)$  are connected in cascade. What is the impulse response  $h_c(n)$  of the overall system? Simplify as much as possible.
- 7) For each of the following signals, determine whether they are (1) linear/non-linear; (2) time invariant/time varying; (3) causal/non-causal; (4) stable/unstable.
  - a)  $y(n) = \text{Round}[x(n)]$ , where  $\text{Round}[x(n)]$  denotes the integer part of  $x(n)$  obtained by round- ing.
  - b)  $y(n) = x(n) + nx(n+1)$

## **ASSIGNMENT FOR B.TECH 6<sup>TH</sup> SEM ELECTRICAL ENGINEERING**

### **Conventional & CAD of Electrical Machines**

#### **Part A**

- a) What are the limitations in designing of machines?
- b) Write output design equation of core and yoke of a transformer.
- c) What is specific electrical loading?
- d) Give classification of insulating materials.
- e) Write down the factors affecting the size of rotating machines.
- f) Give basic difference between single layer and two layer winding.
- g) Define standardization.
- h) Write down the advantages and limitations of computer aided design.
- i) Define electrical specific loading
- j) Define dielectric losses.

#### **Part -B**

- a) Explain the method of determination of full load mmf for a salient pole synchronous generator.
- b) Discuss an arrangement of low voltage and high voltage winding on core of 3-phase core type and 3-phase shell type transformers.
- c) Show that electrical specific loading of a rotating machine is constant provided that current density, ratio of conductor to slot area, ratio of slot width to the slot pitch and the slot depth area are constant.
- d) Explain continuous rating, short time rating and intermittent rating with reference to electrical machines.
- e) Derive the output equation for a 3-phase shell type transformer. State the assumption made. Explain why stepped core is used in transformers.
- f) What is dielectric loss, loss angle and power factor? Explain with the help of equivalent circuit and phasor diagram..

## **ASSIGNMENT FOR B.TECH 6<sup>TH</sup> SEM ELECTRICAL ENGINEERING**

### **Industrial Management**

#### **PART A**

1 qus Explain the scope of Industrial Management?

2 qus what are the types of production system? Ans also explain Industrial Ownership.

3 qus define productivity index?

4 qus write short note on Principle of Management?

5 qus explain the Introduction to supply chain management.

#### **Part B**

1 qus write the short note on Introduction to TQM?

2 qus write the difference between Single, Double and Sequential Sampling?