

Roll No: _____

BTECH
(SEM VII) THEORY EXAMINATION 2023-24
POWER QUALITY AND FACTS

TIME: 3 HRS

M.MARKS: 100

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief.

Q no.	Question	Marks	CO
a.	What is the meaning of the term "Power Quality"?	2	CO1
b.	Define the terms Notching and DC Offset.	2	CO1
c.	What are the Sources of Electrical Transients in the Power system?	2	CO3
d.	Difference between Voltage sag and voltage swell.	2	CO2
e.	Define the effect of capacitor-switching transients on the network.	2	CO3
f.	What are the types of transient overvoltages?	2	CO3
g.	Define the need of FACTS controllers in the power system.	2	CO4
h.	Draw VI characteristics of SVC.	2	CO4
i.	Explain the term Interharmonics.	2	CO5
j.	What is the main cause of Harmonic distortion?	2	CO5

SECTION B

2. Attempt any three of the following:

a.	What are the objectives of standardization of the power quality phenomenon? State and explain important standards used to define and classify power quality disturbances.	10	CO1
b.	What is Voltage Sag? Explain Motor Starting and Arc Furnace.	10	CO2
c.	What are the sources of transient overvoltage? Explain some with suitable example.	10	CO3
d.	What is a static VAR system? Explain its advantages and applications.	10	CO4
e.	Explain Harmonic Mitigation Techniques in detail.	10	CO5

SECTION C

3. Attempt any one part of the following:

a.	What are the major power quality issues? Explain in detail.	10	CO1
b.	Explain Long-duration Voltage variation with a suitable example.	10	CO1

4. Attempt any one part of the following:

a.	Explain estimating voltage sag performance.	10	CO2
b.	Explain the fundamental principle of protection to reduce the voltage sag in detail.	10	CO2

5. Attempt any one part of the following:

a.	What are the devices for overvoltage protection? Explain at least one giving a suitable diagram.	10	CO3
b.	Explain power factor improvement using capacitor switching transient.	10	CO3

6. Attempt any one part of the following:

a.	Explain the operation of DSTATCOM used for sag mitigation. Compare STATCOM and SVC.	10	CO4
b.	Differentiate between SSSC and TCSC.	10	CO4

7. Attempt any one part of the following:

a.	What is the harmonic filter? Write a short note on the benefits of active harmonic filters.	10	CO5
b.	What are the effects of harmonics on the working of transformers? Explain in detail.	10	CO5