

**DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY,
LONERE - RAIGAD - 402 103
Winter Semester Examination - December - 2017**

Branch: M.Tech. (Electrical Engineering/Electrical Power Systems) Semester: I

Subject with Subject Code: Power System Modeling Marks: 60
[MTEPS101/ MTEE101]

Date:- 12 / 12 / 2017

Time:3 Hrs.

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

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- | | (Marks) |
|---|----------------|
| Q.1. Explain the underlying principle behind the park's transformation. Write the equations for synchronous generation in d-q-o forms. | (12M) |
| Q.2. Attempt any TWO of the following | (12M) |
| a) What is need for power system modeling? | |
| b) Explain different area for power system analysis. | |
| c) Explain modeling of boiler. | |
| Q.3. State & Explain Synchronous machine connected to an infinite bus. | (12M) |
| Q.4. Attempt any TWO of the following: | (12M) |
| a) Explain control and protective functions of Excitation systems. | |
| b) Explain basic principle of Excitation systems of syn. Machine. | |
| c) Explain types of excitation system with neat labeled block diagrams. | |

Q.5. Attempt any TWO of the following:

(12M)

- a) Explain modeling of AC Exciter and rectifier.
- b) Explain modeling of self excited dc exciter.
- c) Explain separately excited dc exciter.

Q.6. Attempt any TWO of the following:

(12M)

- a) Explain load modeling parameters acquisition methods.
 - b) Explain induction motor modeling.
 - c) Explain modeling of TCR & TCS.
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Winter Semester Examination - December - 2017**

Branch: M.Tech. Electrical (Electrical Power System)

Semester: I

**Subject with Subject Code: Advanced Power Electronics
(MTEE102 / MTEPS103)**

Marks: 60

Date: 14 / 12 / 2017

Time: 3 Hrs.

Instructions to the Students

1. Each question carries 12 marks.
 2. Attempt any five questions of the following.
 3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
 4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.
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- (Marks)**
- Q.1. Attempt any one of the following. (12)**
- a) Explain switching characteristics of IGBT with voltage and current waveform.
 - b) Explain the basic structure of MOSFET in detail with neat diagram.
- Q.2. Explain the continuous and discontinuous current conduction of single phase full converter with neat circuit diagram and waveform. (12)**
- Q.3. Describe Buck converter under continuous and discontinuous conduction mode operation. (12)**
- Q.4. a) Explain Operation of 3Φ VSI for 120° mode of conduction. Also draw its phase & line voltage. (08)**
- b) Write short notes on space vector modulation. (04)
- Q.5. Attempt any one of the following.**
- a) Describe the series resonant inverters with bidirectional switches in briefly. (12)
 - b) i.) What are the features of multilevel converter? (04)
 - ii.) Write comparisons between ZCS and ZVS resonant converter. (04)
 - iii.) Draw the circuit diagram of diode clamped five level single phase bridge multilevel inverter. (04)
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Q.6.

a) How the energy is saving in AC and DC drives by using power electronics converter control? **(06)**

b) What is the maximum power point tracking? Explain it with block diagram. **(06)**

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Winter Semester Examination - December - 2017**

Branch: M.Tech. (Electrical Power System)

Semester: I

**Subject with Subject Code: Renewable Energy Sources
(MTEPS102)**

Marks: 60

Date: 16 / 12 / 2017

Time: 3 Hrs.

Instructions to the Students:

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

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- Q.1.** a) What is the Kyoto Protocol? What is the purpose of Kyoto Protocol? **(04)**
- b) Write the concept of prototype carbon funds (PFC)? **(04)**
- c) Explain the concept of clean development mechanism (CDM)? **(04)**
- Q.2.** Explain grid connected PV system with its block diagram in briefly. **(12)**
- Q.3.** Describe with a neat sketch the working of a wind energy system (WECS) with main components. **(12)**
- Q.4. Attempt any ONE question of the following.**
- a) i.) What are the factors, which affect biodigestion? Explain in briefly. **(08)**
- ii.) What are the main applications of geothermal energy? **(04)**
- b) i.) Write short notes on small head hydro power development. **(06)**
- ii.) What is a fuel cell? Describe the principle of working of a fuel cell. **(06)**
- Q.5.** a) Explain the Solar-wind hybrid system with neat block diagram in detail. **(06)**
- b) What are the benefits of fly wheel over battery? Describe energy relations of fly wheel. **(06)**
- Q.6.** a) What is the need for improvement of grid interface? Also explain methods of improvement of grid interface. **(08)**
- b) Write Shorts notes on:
- i) stability limit **(04)**
- ii) Wind farm capacity limit. **(04)**

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Winter Semester Examination - December - 2017**

Branch: M. Tech. (Electrical Power System)

Semester: I

Subject with Subject Code: High Voltage Power Transmission

Marks: 60

[MTEP104-1]

Date: 18 / 12 / 2017

Time: 3 Hrs.

Instructions to the Students:

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.
5. Right side figure indicates the marks carried by the questions.

- Q.1 Explain the electrical design aspect of EHV AC overhead transmission line system. [12]
- Q.2 **Solve the following questions. (Any Two)** [12]
- (a) A surge of 100kV travels along an overhead line towards its junction with a cable. The surge impedances for the overhead line and cable are 400 ohms and 50 ohms respectively. Find the magnitude of the surge transmitted on the cable. Comment on the results.
- (b) What is the arcing ground phenomenon?
- (c) Explain the term Surge Arresters along with its ideal characteristics, and explain in brief the Thyrite Surge Arrester with neat diagram.
- Q.3 **Attempt the following questions. (Any Two)** [12]
- (a) Explain the effect of electro static field humans, animals and plants.
- (b) Discuss in brief the significance of electric field stress at ground level.
- (c) Show the effect of reactive power flow on voltage at sending and receiving end of transmission line.
- Q.4 **Solve the following questions.**
- (a) State the merits of HVDC system as compared to EHV AC for (i) Long High Power Lines and (ii) Interconnection. [06]
- (b) A bipolar two terminal HVDC link is delivering 1000 MW at ± 500 KV at the receiving end. Total losses in DC circuit are 60 MW. Calculate the following: (i) Sending end power, (ii) Power in the middle of line, (iii) Sending end voltage, (iv) Voltage at middle of line, (v) Total resistance of the DC circuit. [06]
- Q.5 **Answer the following questions.** [12]
- (a) Explain the functional requirement of control system to operate the HVDC link to transfer the power from One AC system to another AC System, and also state the main objective of control of it.
- (b) Explain the necessity of reversal of power and method of reversal of power through HVDC link.
- Q.6 **Answer the following questions.**
- (a) Draw a schematic diagram and describe the commutation principle in HVDC circuit breaker. [06]
- (b) Explain the radial and mesh configurations of MTDC of a HVDC transmission system. [06]

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Branch: M. Tech. (Electrical Power System)

Semester: I

Subject with Subject Code: Power Quality Assessment and Mitigation
[MTEPS105]

Marks: 60

Date: 20 / 12 / 2017

Time: 3 Hrs.

Instructions to the Students:

1. Each question carries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.
5. Right side figure indicates the marks carried by the questions.

- Q.1** Define the term Electric Power quality and what are the major reasons concerns about it? Discuss on basic steps involved in a power quality evaluation. [12]
- Q.2** Answer the following questions. (Any Two) [12]
- (a) Explain the term transient and discuss the different types of transients occurring in the power system with neat sketch.
 - (b) Discuss the terms voltage flicker and voltage unbalance thoroughly.
 - (c) Discuss an impact of reactive power on power system. Explain any one method of reactive power management.
- Q.3** Attempt the following questions. (Any Two) [12]
- (a) Define Voltage sag. Discuss on methods of voltage sag assessment.
 - (b) With neat sketch explain the utility distribution system sag performance evaluation. Enlist different measures for voltage sag.
 - (c) Explain With figure voltage sag mitigation through Constant Voltage Transformer (CVT).
- Q.4** Solve the following questions. [06]
- (a) Differentiate clearly between sub harmonics and inter harmonics. Discuss on causes and effects of harmonics. [06]
 - (b) Give complete classification of harmonic indices. Explain term THD of harmonics. [06]
- Q.5** Answer the following questions. [06]
- (a) Enlist different power quality measuring instruments. Explain important factors that should be considered when selecting the PQ measuring instrument. [06]
 - (b) With neat sketches explain the features of hand held oscilloscope used for PQ measurement. [06]
- Q.6** Attempt the following questions. [06]
- (a) Write a short note on IEEE Standard 519-1992. [06]
 - (b) What do you understand by term Isolated Ground? Explain it with proper figure. [06]

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