Roll No. _____

[Total No. of Pages : 2]

**8E4109**

**8E4109**

## B. Tech. VIII Semester (Main/Back) Examination-2014
### Electrical Engineering
### 8EE1 EHV AC/DC Transmission
### (Common with 8E X1)

**Time : 3 Hours**

**Maximum Marks : 80**
**Min. Passing Marks : 24**

*Instructions to Candidates:*

*Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

### Unit - I

1. What is the need of EHV transmission & what are the problems associated with it?

(16)

**OR**

1. a) Explain audio and radio noise. (8)
   b) Explain surge impedance loading. (8)

### Unit - II

2. a) Explain flat tie line load bias control. (8)
   b) Explain Automatic Generation Control. (8)

**OR**

2. Describe with neat diagram the speed governing system to control the real power flow in the power system. (16)

### Unit - III

3. a) What do you mean by shunt compensation? How it is different from series compensation. (8)
   b) What do you mean by reactive power? Give various sources of reactive power.

(8)

**OR**

3. a) What is the necessity of tap changing transformer? Describe its function in power system. **(8)**

b) Describe FC-TCR scheme with the help of circuit and control characteristic diagram. **(8)**

## Unit - IV

4. a) Describe static synchronous compensator (STATCOM). **(8)**

b) Explain Unified Power Flow Controller (UPFC) with suitable diagram. **(8)**

## OR

4. a) What are the benefits of using FACTs devices? **(8)**

b) Explain static VAR compensator with the help of schematic diagram. **(8)**

## Unit - V

5. a) Describe in brief the different types of DC links. **(8)**

b) What are the advantages & disadvantages of HVDC transmission system?**(8)**

## OR

5. a) What is ground return? What are the problems associated with the use of ground as the return conductor. **(8)**

b) Explain with schematic diagram operation of DC converter. **(8)**

Roll No. _____     [Total No. of Pages { 2 ]

## 8E4110

8E4110

# B. Tech. VIII Semester (Main/Back) Examination-2014
## Electrical Engineering
## 8EE2 Electric Drives and Their Control
## (Common with 8E X2)

**Time : 3 Hours**     **Maximum Marks : 80**
     **Min. Passing Marks : 24**

***Instructions to Candidates:***

*Attempt any **five** questions, selecting **one** question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)*

## Unit - I

1. a) Explain load equalization in drives with necessary diagrams and derivations.(8)

   b) A motor equipped with a flywheel is to supply a load torque of 1000 N-m for 10 sec. followed by a light load period of 200 N-m long enough for the flywheel to regain its steady state speed. It is desired to limit the motor torque to 700 N-m. What should be the moment of inertia of flywheel? Motor has an inertia of 10 Kg - m². Its no load speed is 500 rpm and the slip at a torque of 500 N-m is 5%. Assume speed - torque characteristics of motor to be a straight line in the region of interest.     (8)

**OR**

1. a) Enumerate the various nature and classification of load torques.     (8)

   b) Explain what do you understand by the steady state stability? What is the main assumption?     (8)

## Unit - II

2. a) State and explain the important features of various braking methods of d.c. motors.     (8)

   b) A 220 V, 200 A, 800 rpm dc separately excited motor has an armature resistance of $0.06\Omega$. The motor armature is fed from a variable voltage source with an internal resistance of $0.04\Omega$. Calculate internal voltage of the variable voltage when the motor is operating in regenerative braking at 80% of the rated motor torque and 600 rpm.     (8)

**OR**

2. a) Explain the various methods of speed control for d.c. motors. **(8)**
   b) A 200 V, 10.5 A, 2000 rpm shunt motor has the armature and field resistances of 0.5 and 400Ω respectively. It drives a load whose torque is constant at rated motor torque. Calculate speed if source voltage drops to 175 V. **(8)**

**Unit - III**

3. a) Explain the various starting methods for three phase induction motors. **(8)**
   b) A 400 V, star connected, 3 phase, 6 pole, 50 Hz induction motor has following parameters referred to stater : $R_s = R_r^1 = 1\Omega, X_s = X_r^1 = 2\Omega$. For regenerative braking operation of this motor determine over hauling torque it can hold and range of speed for safe operation. **(8)**

**OR**

3. a) Discuss the voltage source inverter fed induction motor drive operated in stepped wave inverter mode. **(8)**
   b) Discuss the A.C. dynamic braking with two lead connection for Induction motor drives. **(8)**

**Unit - IV**

4. a) Explain the slip power recovery scheme with static scherbius drive. **(8)**
   b) Explain the static rotor resistance control for I.M. drives. **(8)**

**OR**

4. a) Explain static Kramer drive for I.M. drives with necessary derivation and sketches. **(8)**
   b) Discuss the current source inverter control for I.M. drives. **(8)**

**Unit - V**

5. a) Discuss the operation of VSI fed self controlled synchronous motor drives.**(8)**
   b) Explain the braking of synchronous motor with VSI. Draw the speed torque characteristics for regenerative braking. **(8)**

**OR**

5. a) Explain the control of synchronous motor with CSI. **(8)**
   b) Explain the dynamic braking of synchronous motar with VSI. **(8)**

---

Roll No. _____          [Total No. of Pages : 2

**8E 4111**

## B.Tech. VIII Semester (Main/Back) Examination - 2014
### Electrical Engg.
### 8EE3 Switchgear & Protection
### (Common with 8EX3)

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

***Instructions to Candidates:***

*Attempt any **five** questions, selecting **one** question from each **unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)*

### Unit - I

1.  a)  Explain the Hall effect devices. How can they be used as phase comparator?
    (8)

    b)  With the help of the block diagram and circuit, explain instantaneous over current relay.
    (8)

**OR**

1.  a)  Discuss the duality between phase & amplitude comparator?
    (8)

    b)  Giving the name of some static relays, discuss the advantages of static relays ever electromagnetic relays.
    (8)

### Unit - II

2.  a)  Describe the circuit of static differential relay for three-phase winding transformer.
    (8)

    b)  How static MHO relay is realized using a phase comparator? Explain with its characteristic.
    (8)

**OR**

2.  a)  Explain, why the percentage bias differential relay is used in place of differential relay protection of alternators?
    (8)

b) Describe the principle of differential system of protection applied to a power transformer. What are the difficulties experienced and how are they overcome? (8)

## Unit - III

3. a) How, quadrilateral characteristics are realized with the help of phase comparators? Explain. (8)

   b) What is the principle of operation of directional comparison and phase comparison carrier protection? (8)

### OR

3. a) Discuss in detail, the basic apparatus and schemes of power line carrier system. (8)

   b) What are blinders? Explain elliptical relay briefly. (8)

## Unit - IV

4. a) Explain the principle of operation of minimum oil circuit breaker. (8)

   b) What is resistance switching? Derive the expression for critical resistance which gives no transient oscillation. (8)

### OR

4. a) Discuss the different arc-interruption theories for interruption of arc in circuit breakers. (8)

   b) In a 220 kV system, the reactance & capacitance upto the location of circuit breaker is $8\,\Omega$ and $0.025\,\mu F$ respectively. A resistance of 600 ohms is connected across the contacts of the circuit breaker. Determine:-
   
   i) Natural frequency of oscillation
   
   ii) Damped frequency of oscillation
   
   iii) Critical value of resistance which will give no transient oscillation.
   
   iv) The value of resistance which will give damped freq. of oscillation, one fourth of the natural freq. of oscillation. (8)

## Unit - V

5. a) Describe the construction & operating principle of vacuum circuit breaker. What are its advantages over conventional type circuit breaker? (8)

   b) With a neat sketch, describe the working principle of an arial air blast type circuit breaker. Explain, why resistance switching is used with this type of circuit breaker? (8)

### OR

5. a) Describe digital relay, with the help of its block diagram. (8)

   b) Explain the following:-
   
   i) Selection of circuit breakers for different ranges.
   
   ii) Transmission live distance protection (8)

---

Roll No. _____                [Total No. of Pages : 2 ]

8E4112

8E4112

B. Tech. VIII Semester (Main/Back) Examination-2014
Electrical Engineering
8EE4.1 Non Conventional Energy Sources
(Common with 8EX4.3)

Time : 3 Hours                                      Maximum Marks : 80
                                                   Min. Passing Marks : 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

## Unit - I

1. a) What are the conventional and non conventional energy sources? What are the advantages of non -conventional energy sources?           (3+3)

   b) Explain the various methods of tidal power generation. What are the limitations of each method?           (6+4)

### OR

1. a) What is role of renewable energy sources in present time for our country? (6)

   b) State the present status of tidal power plants in India. Why is the tidal energy not being utilized?           (6+4)

## Unit - II

2. a) Determine the average value of solar radiation on a horizontal surface for June 22 (declination ($\delta$)=+23.5°) at the latitude of 10°N, if constants a and b are given as equal to 0.30 and 0.51 respectively, and the ratio n/N=0.55.           (8)

   b) What are the main components of a flat plate solar collector, explain the function of each.           (8)

### OR

2. a) What is solar pond? Describe principle of operation of a solar pond.   (2+4)

   b) Explain the photovoltaic principle. Describe a basic photovoltaic system for power generation.           (3+7)

## Unit - III

3. a) Explain the working of horizontal axis two blade wind mill with suitable diagram. (10)

   b) What is geothermal energy? Discuss the various ways of geothermal power generation. (2+4)

**OR**

3. a) Wind speed is 10 m/s at the standard atmospheric pressure. Calculate (i) the total power density in wind stream, (ii) the total power produced by a turbine of 100 m diameter with an efficiency of 40%. Air density=1.226 J/Kg.K/m³. (8)

   b) What are the different sources of geothermal energy? What do you mean by dry steam, wet steam and hot water geothermal systems? (4+4)

## Unit - IV

4. a) What is the basic principle of fusion reaction? What are future prospects and present problems of fusion energy? (4+4)

   b) What is plasma confinement? Describe any one method of such confinement. (2+6)

**OR**

4. a) Explain how electricity is generated from a nuclear reaction? What are advantages and disadvantages of nuclear reactors? (4+4)

   b) Describe the working of inertial confinement fusion or pellet fusion reactor. (8)

## Unit - V

5. a) With a neat diagram, discuss the working of Deenbandhu biogas plant. (8)

   b) What is biomass? Explain the thermo-chemical conversion technology of biomass. (1+7)

**OR**

5. a) Discuss the parameters to be controlled to achieve biogas production efficiently. (8)

   b) What is ethanol? Discuss the process of production of ethanol from biomass. How does ethanol blended fuel benefit the environment? (1+4+3)

---

Roll No. _____     [Total No. of Pages : 2

8E 4111

**B.Tech. VIII Semester (Main/Back) Examination - 2014**
**Electrical Engg.**
**8EE3 Switchgear & Protection**
**(Common with 8EX3)**

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 24

*Instructions to Candidates:*

*Attempt any **five** questions, selecting **one** question from each **unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)*

### Unit - I

1.  a)  Explain the Hall effect devices. How can they be used as phase comparator?
    **(8)**

    b)  With the help of the block diagram and circuit, explain instantaneous over current relay.
    **(8)**

**OR**

1.  a)  Discuss the duality between phase & amplitude comparator?
    **(8)**

    b)  Giving the name of some static relays, discuss the advantages of static relays ever electromagnetic relays.
    **(8)**

### Unit - II

2.  a)  Describe the circuit of static differential relay for three-phase winding transformer.
    **(8)**

    b)  How static MHO relay is realized using a phase comparator? Explain with its characteristic.
    **(8)**

**OR**

2.  a)  Explain, why the percentage bias differential relay is used in place of differential relay protection of alternators?
    **(8)**

b) Describe the principle of differential system of protection applied to a power transformer. What are the difficulties experienced and how are they overcome? **(8)**

## Unit - III

3. a) How, quadrilateral characteristics are realized with the help of phase comparators? Explain. **(8)**

b) What is the principle of operation of directional comparison and phase comparison carrier protection? **(8)**

### OR

3. a) Discuss in detail, the basic apparatus and schemes of power line carrier system. **(8)**

b) What are blinders? Explain elliptical relay briefly. **(8)**

## Unit - IV

4. a) Explain the principle of operation of minimum oil circuit breaker. **(8)**

b) What is resistance switching? Derive the expression for critical resistance which gives no transient oscillation. **(8)**

### OR

4. a) Discuss the different arc-interruption theories for interruption of arc in circuit breakers. **(8)**

b) In a 220 kV system, the reactance & capacitance upto the location of circuit breaker is 8 Ω and 0.025 μF respectively. A resistance of 600 ohms is connected across the contacts of the circuit breaker. Determine:-
   i) Natural frequency of oscillation
   ii) Damped frequency of oscillation
   iii) Critical value of resistance which will give no transient oscillation.
   iv) The value of resistance which will give damped freq. of oscillation, one fourth of the natural freq. of oscillation. **(8)**

## Unit - V

5. a) Describe the construction & operating principle of vacuum circuit breaker. What are its advantages over conventional type circuit breaker? **(8)**

b) With a neat sketch, describe the working principle of an arial air blast type circuit breaker. Explain, why resistance switching is used with this type of circuit breaker? **(8)**

### OR

5. a) Describe digital relay, with the help of its block diagram. **(8)**

b) Explain the following:-
   i) Selection of circuit breakers for different ranges.
   ii) Transmission live distance protection **(8)**