

8E8041	Roll No. _____	[Total No. of Pages : 3]
	<div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">8E8041</div> <p>B.Tech. VIII Semester (Main) Examination, April 2016 Electrical and Electronics Engineering 8EX1A EHV AC/DC Transmission Common with 8EE1A</p>	

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 technical and economical reasons for adopting EHV transmission system for transfer of bulk power over long distance (8)
- b) What is meant by power handling capacity of a transmission line? Write the equation for power handling capacity and percentage transfer loss in the line and explain how the higher transmission voltages are important for bulk power transmission (8)

OR

1. a) Give the reasons in detail for using bundled conductor in EHV AC transmission. Briefly explain the properties of bundled conductor (8)
- b) Describe the effect of electrostatic field on
 - i) Humans
 - ii) Animals
 - iii) Plants (8)

Unit - II

2. a) Two generator rated 250MW and 500MW are operating in parallel. The drop characteristics of the governors are 4% and 5% respectively. How would a load of 750 MW be shared between them? What will be the system frequency? Take nominal frequency is 60 Hz (8)

- b) Explain the automatic generation control along with the block diagram (8)

OR

2. a) Explain the flat frequency, flat tie line and tie line load bias control method of load frequency control (8)

- b) Draw schematic diagram of a speed governing system to control the real power flow in power system and explain in brief (8)

Unit - III

3. a) What do you mean by reactive power? Give various sources of reactive power (8)

- b) What are the types of tap changing transformer? Describe their function to control the voltage (8)

OR

3. a) What do you mean by shunt compensation? How it is different from series compensation. (8)

- b) Write short notes on

i) FC-TCR

ii) Booster transformer (8)

Unit - IV

4. a) Explain the working of UPFC used for power system (8)

- b) Explain how the STATCOM is used as a FACT controller (8)

OR

4. a) Explain types of FACTS controllers (8)

- b) Explain briefly how voltage control and reactive power control can be achieved using a TCSC-TCR (8)

Unit - V

5. a) What is ground return? What are the problems associated with the use of ground as the return conductor (8)
- b) Explain in details the different types of DC links (8)

OR

5. a) Discuss the advantages and disadvantages of HVDC transmission (8)
- b) With a neat schematic diagram state the various apparatus required for HVDC station and explain purpose of each (8)

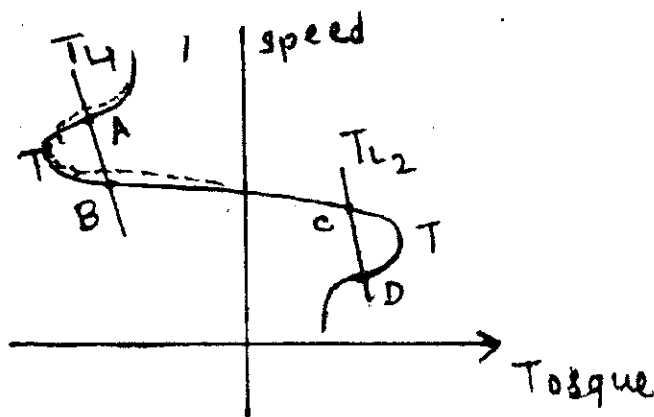
8E 8042**8E 8042****B.Tech. VIII Semester (Main/Back) Examination, April/May 2016****Electrical and Electronics Engineering****8EX2A Electric Drives & Their Control****Common With 8EE2A****Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 24****Instructions to Candidates:**

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 is the concept of steady state stability explain. Also comment on the stability of the operating point A, B, C, D in the given plot of speed v/s motor and load torques



T : Motor Torque

T_L : Load Torque

- b) Drive the equivalent values of drive parameter
- For loads with rotational motion
 - For loads with translation motion

OR

1. a) Explain the concept of load equalization
- b) Explain the speed torque convention and multiquadrant operation of electrical drive with an suitable example

Unit - II

2. a) Explain the following breaking method for D.C. series and separately excited motors
 - i) Dynamic breaking
 - ii) Plugging
- b) A 200V, 10.5 A, 2000 rpm shunt motor has the armature and field resistance of 0.5 and 400Ω respectively. It drives a load whose torque is constant at rated motor torque calculate motor speed if the source voltage drops to 175V

OR

2. a) A 200V, 875 rpm, 150A separately excited dc motor has an armature resistance of 0.06Ω . It is fed from a single phase fully controlled rectifier with an AC source voltage of 220V, 50 Hz assuming continuous conduction calculate
 - i) Firing angle for rated motor torque and 750 rpm
 - ii) Motor speed for $\alpha = 160^\circ$ and rated torque
- b) Explain the chopper control of separately excited dc motors for
 - i) Motoring control
 - ii) Regenerative braking control

Unit - III

3. a) Explain the any four methods of starting of an Induction motor drive
- b) A 2200V, 2600kW, 735 rpm, 50Hz, and 8 pole 3 phase squirrel cage induction motor has the following parameter referred to the stator $R_s = 0.075\Omega$ $R_r' = 0.1\Omega$ $X_s = 0.45\Omega$ $X_r' = 0.55\Omega$ stator winding is delta connected and consists of two section connected in parallel
 - i) Calculate starting torque and maximum torque as a ratio of rated torque. If the motor is started by star-delta switching
 - ii) What will be the value of maximum line current and torque during starting if the part winding method of starting is employed

OR

3. a) A 400V star connected 3 phase 6 pole 50 HZ induction motor has following parameter referred to the stator $R_s = R_r' = 1\Omega$ $X_s = X_r' = 2\Omega$ for regenerative braking operation of the motor determine
 - i) Maximum overhauling torque it can hold and range of speed for safe operation
 - ii) Speed at which it will hold an overhauling load with a torque of 100 N-m

- b) Discuss the operation of Voltage Source Converter (VSI) control for an induction motor drive

Unit - IV

4. Explain the following
- Static rotor resistance control
 - Static Kramer drive

OR

4. Explain the following
- Slip power recovery
 - Stator Scherbius drive

Unit - V

5. Explain the following with neat clean sketch
- Regenerative braking of synchronous motor with VSI
 - Dynamic braking of synchronous motor with VSI

OR

5. Explain the following
- Control of synchronous motor using Current Source Inverter(CSI)
 - VSI fed self controlled synchronous motor drive
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8E8043**8E8043**

B.Tech. VIII Semester (Main) Examination, April 2016
Electrical and Electronics Engineering
8EX3A Protection of Power System
Common with 8EE3A

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 different types of faults? Which type of fault is most dangerous. And explain essential qualities of a protective relay. And also explain the basic operation of trip circuit with suitable circuit diagram (10)
- b) Explain what you understand by primary and back-up protection. What are the various methods of providing back-up protection (6)

OR

1. a) Draw the magnetization characteristics of protective and measurement CTs. And give the comparison between measuring CTs and protective CTs. (8)
- b) Derive phase angle and ratio error for PT? (8)

Unit - II

2. a) Classify and explain different types of over current relays. And also draw characteristics of various overcurrent relays (8)
- b) The current rating of an over current relay is 5A. The relay has a plug-setting of 150% and Time Multiplier Setting(TMS) of 0.4. The CT ratio is 400/5. Determine the operating time of the relay for a fault current of 6000A. At TMS=1 operating time at various PSM are given in the table-I

Table-I

PSM	2	4	5	8	10	20	
Operating time in seconds	10	5	4	3	2.8	2.4	(8)

OR

2. a) Discuss the protective scheme for a feeders (8)
- b) Describe the construction principle of operation of a directional over current relay. And how the 30° , 60° , 90° connections of directional over current relay are obtained (8)

Unit - III

3. a) Describe the construction and operating principle of the percentage differential relay. How the percentage differential relay overcomes the drawbacks of the simple differential relay (10)
- b) Explain different types of faults occur in generator (6)

OR

3. a) Describe the negative sequence protection schemes for generator (8)
- b) Explain stator inter-turn fault protection for multi turn generator with suitable circuit diagram (8)

Unit - IV

4. What is magnetizing inrush current? What measures are taken to distinguish between the fault current and magnetizing inrush current? Discuss the protective scheme which protects the transformer against faults but doesnot operate in case of magnetizing inrush current (16)

OR

4. a) Explain the construction and working of Buchholz relay. Against which faults Buchholz relay gives the protection (8)
- b) What is frame leakage protection of busbar? Discuss its principle and field of application. (8)

Unit - V

5. What is universal Torque equation? Using this equation derive and draw following characteristics
- i) Impedance relay

- ii) Reactance relay
- iii) Mho relay

And also discuss the application of the impedance relay, reactance relay and Mho relay. (16)

OR

5. a) Explain the three stepped distance protection of transmission line (8)
- b) Describe the protection provided to Induction motors for earth faults (8)
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	<div style="border: 1px solid black; display: inline-block; padding: 2px 10px; margin: 5px 0;">8E8044</div> <p style="text-align: center; margin: 0;"> B.Tech. VIII Semester (Main) Examination - May 2016 Electrical and Electronics Engineering 8EX4.1 A Utilization of Electrical Power </p>	

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) Briefly describe the principle of induction heating at high frequency and highlight a few application of eddy current heating. (8)
- b) In the case of hardening a steel pulley, the depth of penetration required is 1.4 mm. The relative permeability is unity and the specific resistivity of steal is $5 \times 10^{-7} \Omega \text{ m}$. Determine the frequency of supply which is required to perform above operations. (8)

OR

1. Explain resistance welding, their types, advantages and disadvantages with suitable diagrams. (16)

Unit - II

2. a) Describe with the help of a neat diagram the construction and working of a high pressure mercury vapour lamp. (8)
- b) Discuss about the stroboscopic effect and it's remedies with respect to illumination. Also explain sodium vapour lamp in detail. (8)

OR

2. a) Explain the principle of photometry. Also discuss about various photometer heads in detail. (8)
- b) Discuss the law of illumination and its limitations. (8)

Unit - III

3. a) State various types of power supplies used for electrolytic process. Discuss any one of them in detail (8)
- b) Describe the process of extraction of metal or electro - extraction. Explain how zinc and aluminium are extracted from their ores. (8)

OR

3. a) State and explain faradays law of electrolytic process. What factors govern the rate of electrodeposition process. (8)
- b) Find the quantity of electricity and the steady current required to deposit 8gm of copper from the copper sulphate solution in 1 hour. The Electrochemical equivalent of copper is 0.3294 Mgm/c. (8)

Unit - IV

4. a) Discuss the suitability of DC series motor for its application in electric locomotive for traction duty. (8)
- b) Write short note on any two of followings: (2×4=8)
- i) Trolley collector
 - ii) Conductor rail system
 - iii) Third rail system of current collection.

OR

4. a) What are the various traction systems in practice in our country? Give the advantages of electric drives with its limitations and discuss briefly the factors governing the final choice of traction system. (8)
- b) Define any four terms of followings: (4×2=8)
- i) Crest speed.
 - ii) Average speed
 - iii) Schedule speed
 - iv) Adhesive weight
 - v) Coefficient of adhesion
 - vi) Tractive effort

Unit - V

5. a) Sketch the speed - time curve for urban, suburban and main line services. Give the approximate values of acceleration, braking and coasting period in each case. (8)
- b) Write short note on ward - leonard method for speed controls. (8)

OR

5. a) Discuss the advantages of series - parallel starting against the ordinary rheostatic starting for a pair of DC traction motors.
- b) Explain the advantages and disadvantages of the regenerative braking of electric traction motor? (8)

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8E4111**8E4111****B.Tech. VIII Semester (Old/Back) Examination, April/May 2016****Electrical Engg.****8EE3 (O) Switchgear & Protection****Common With 8EE3, 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) What are the different types of phase comparators describe the coincidence type of phase comparator (8)
- b) Explain briefly the phase splitting type amplitude comparator (8)

OR

1. a) With the help of diagram explain the working principle of static inverse time over current relay (8)
- b) Explain the working of the state directional overcurrent relay with the help of diagrams (8)

Unit - II

2. a) Describe the construction and operating principle of state impedance relay using an amplitude comparator (8)
- b) With the help of diagram explain how transformers are protected with the static differential protection (8)

OR

2. a) With the help of schematic diagram. Explain the operation of static MHO relay using amplitude comparator (8)

- b) Explain in brief how static reactance relay is realized using sampling comparator (8)

Unit - III

3. a) Describe with neat diagrams, the directional comparison scheme of carrier current protection. (8)
- b) Explain a method to Protect lines with the help of carrier assisted distance protection. (8)

OR

3. a) Draw and explain the relay to realize elliptical characteristics (8)
- b) What is out of step tripping. Discuss the operating principles of an out of step tripping relay with the help of relevant diagram (8)

Unit - IV

4. a) In a 132 Kv system, the inductance and capacitance upto the location of a circuit breaker is 0.44 and 0.15 μf respectively. Determine (8)
- i) The maximum value of the restriking voltage across the contact of circuit breaker
- ii) The maximum value of RRRV
- b) Describe the following terms (8)
- i) Current chopping
- ii) Resistance switching

OR

4. a) Explain briefly oil circuit breakers. Also differentiate between bulk oil and minimum oil circuit breaker (8)
- b) Discuss the following (4+4)
- i) Restriking voltage
- ii) Recovery voltage

Unit - V

5. a) Describe the construction, operating principle and application of vacuum circuit breaker (8)
- b) Enumerate various types of ratings of a circuit breaker. Discuss symmetrical and asymmetrical breaking capacity (8)

OR

5. a) With the help of block diagram explain the digital Protection schemes (8)
- b) With a neat sketch describe the working principle of an axial air blast type circuit breaker (8)
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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) State the present status of world energy situation (8)
- b) Differentiate between conventional and non conventional sources of energy (8)

OR

1. a) Describe double basin arrangement of tidal energy (8)
- b) Discuss prospects of tidal energy in India (8)

Unit - II

2. a) Differentiate between paraboloidal and heliostat concentrating collector (8)
- b) Discuss solar cell array with the help of neat and well labelled diagram (8)

OR

2. a) Describe the main components of basic solar power plant & explain function of each (10)
- b) What is solar pond? Describe principle of operation of solar pond (6)

Unit - III

3. a) Differentiate between horizontal and vertical axis wind turbine (8)
- b) What factors affect the selection of site for wind energy conversion system (8)

OR

3. a) Differentiate between variable speed constant frequency and variable speed variable frequency schemes of electric generation (8)
- b) List advantages and disadvantages of geothermal energy (8)

Unit - IV

4. a) Describe various components of laser fusion sector with the help of neat and well labelled diagrams (10)
- b) What are the typical requirements for nuclear fusion (6)

OR

4. a) Differentiate between fusion hybrid and cold fusion (8)
- b) Discuss magnetic confinement in nuclear fusion (8)

Unit - V

5. a) Describe various components of Pragati design biogas plant with help of neat and well labelled diagram (10)
- b) Describe pyrolysis scheme of biomass energy (6)

OR

5. a) Describe Deen Bandhu biogas plant in detail (8)
- b) Differentiate between fixed dome type and floating gas holder type biogas plants (8)
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