

## B.Tech. Degree VII Semester Examination November 2013

### CS/EB/EC/EE/EI/IT 701 INDUSTRIAL ORGANISATION AND MANAGEMENT (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

#### PART A (Answer ALL questions)

(8 × 5 = 40)

- I. (a) Define organisation. Bring out the differences between a formal organization and an information organisation.  
(b) Explain accountability and authority.  
(c) Enumerate the roll played by Gilbreth in the evolution of scientific management.  
(d) Define motivation and explain how motivation enables improvements in productivity.  
(e) What are the objectives of personnel management?  
(f) Explain overhead. Describe three ways of allocating overheads.  
(g) What do you mean by Economic Order Quantity? On what factors do EOQ depends on? Derive an expression for EOQ.  
(h) Write on standard costing and marginal costing.

#### PART B

- II. (a) Explain matrix organisation. (7)  
(b) List the characteristics of a co-operative organisation. (8)
- OR
- III. What are the different types of business organisation? (15)
- IV. (a) What are the skills required for a manager? (5)  
(b) Explain line function and staff function. Bring out their importances. (6)  
(c) What are the social responsibilities of management? (4)
- OR
- V. (a) Explain job evaluation and merit rating. (5)  
(b) Enumerate important functions of personnel management. (10)
- VI. (a) Explain the objectives of MRP. (6)  
(b) What is productivity? What is its importance to an industrial organisation? Explain ways to improve productivity. (9)
- OR
- VII. (a) What is the difference between cost and price? Explain various pricing methods. (5)  
(b) What is meant by inflation? How does inflation affect profitability? (5)  
(c) What is the importance of corporate budgeting? Explain the process of budgeting. (5)
- VIII. Explain the role of MRP in an industrial organisation. Give detailed account of the procedure involved in planning the material requirement. (15)
- OR
- IX. (a) Explain the importance of ABC analysis. (8)  
(b) A company engaged in the manufacture of auto components requires 2,00,000 pieces of copper strips of a particular size. The company orders the strips as lots of 20,000 units. Ordering cost is ₹400 and carrying charges are expressed at 10% unit cost. The strip costs ₹20 per piece. Determine the economic order quantity if the cost incurred for every back order is ₹25. (7)

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## B.Tech. Degree VII Semester Examination November 2013

### EE 702 DESIGN ESTIMATION AND COSTING (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

#### PART A (Answer ALL questions)

(8 × 5 = 40)

- I. (a) What are the factors to be considered for selecting the size of conductors?
- (b) Explain the criteria for selecting HT underground cable.
- (c) What are the requirements of good street lighting?
- (d) A room of size 15 x 6 meters is to be illuminated by twenty 200W lamps. The mscsp of each lamp is 250. Assume a depreciation factor 1.2 and utilization factor 0.6. Find the average illumination produced on the floor.
- (e) State the important points to be kept in view while carrying out wiring for a motor installation.
- (f) How is the size of conduit for motor wiring determined?
- (g) What are the advantages of outdoor substations over indoor substations?
- (h) What are the factors which are to be considered for a selection of a site of a substation?

#### PART B

(4 × 15 = 60)

- II. Design a bakelite sheet for a switch panel board which contains four switches, one 5A socket outlet and one fan regulator.

Length of the regulator = 150mm  
Length of the switches and socket = 55mm  
Width of the regulator = 85mm  
Width of the switch = 24mm  
Width of the socket = 40mm

OR

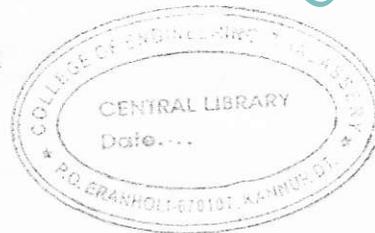
- III. Explain service connections.

- IV. A factory hall measuring 36m x 20m is to be illuminated so as to provide illumination of 35 lumens per square metre at working place. Assume suitable space ratio, mounting height, utilization factor and depreciation factor. Calculate the number of incandescent lamps, wattage of each lamp and show the arrangement of lamps proposed. Give also layout of wiring and estimate cost of wiring.

OR

- V. A cinema house measuring 36m x 27m has a seating capacity of 600 persons and located near the centre of the town and receives the supply at 415V, 3 $\phi$ , 50 Hz. Prepare the scheme of electrification of the above cinema hall providing.
  - (i) details of the circuit diagrams.
  - (ii) Specifications and quantity of material.

(P.T.O)



- VI. A 10 HP, 415V,  $3\phi$ , 50 Hz induction motor is to be installed in a workshop of area 25m x 10m. Show the plan, layout of the wiring and estimate the quantity of material required and give its approximate cost.

**OR**

- VII. A small workshop has to be equipped with the following machinery:

- (i) One shaper machine with 5 HP, 415v,  $3\phi$  motor
- (ii) One lathe driven by 3 HP, 415 V,  $3\phi$  motor
- (iii) One drilling machine with  $\frac{1}{2}$  HP, 240V,  $1\phi$  motor
- (iv) One grinding machine with 1 HP,  $3\phi$ , 415 V motor



Draw a floor plan of placing these machines assuming the workshop area to be 30m x 15m. Sketch the wiring diagram. Prepare a list of material required and estimate the complete cost of wiring scheme.

- VIII. Estimate the quantity of material and cost for erection of a 250 KVA pole-mounting substation.

**OR**

- IX. Prepare a list of materials required and work out the cost of installation of a 400 KVA, indoor type, 11/0.433 KV transformer.

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## B.Tech. Degree VII Semester Examination November 2013

### EE 703 POWER SYSTEM II (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

#### PART A (Answer ALL questions)

(8 × 5 = 40)

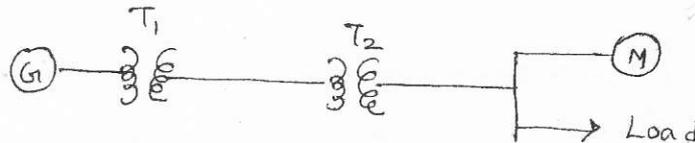
- I. (a) Define the per unit value of a quantity. How will you change the base impedance from one set of base values to another set?
- (b) What are the assumptions made in drawing reactance diagram?
- (c) Explain briefly the system constraints in economic load dispatch.
- (d) Define input-output curves and incremental rate curves.
- (e) What are the various types of faults? Write the relative frequency of occurrence of these faults.
- (f) What are the main factors to be considered to select a circuit breaker? Why is the circuit breaker interrupting current asymmetrical?
- (g) The moment of inertia of a 4 pole, 100MVA, 11KV, 3 $\phi$ , 0.8pf, 50Hz turbo alternator is 10000 Kg m<sup>2</sup>, calculate H and M.
- (h) Define stability of a power system and mention its types.

#### PART B

(4 × 15 = 60)

- II. Explain Gauss-Siedel method of load flow solution. (15)
- OR
- III. Figure shows a two machine system. The ratings are as follows. (15)

Synchronous generator	: 20MVA, 11KV, $X'' = 0.15$ pu
Synchronous motor	: 15MVA, 11KV, $X'' = 0.15$ pu
T <sub>1</sub>	: 25MVA, 12.5 $\Delta$ / 132 $\gamma$ KV, $X = 0.1$ pu
T <sub>2</sub>	: 20MVA, 132 $\gamma$ / 11 $\Delta$ KV, $X = 0.1$ pu
Line	: 200 + j500 $\Omega$
Static load	: 5MVA, 0.8pf lagging



Draw the impedance diagram for the system. Choose a base voltage of 132 KV for the transmission line and a base volt amperes of 20MVA.

(P.T.O.)

- IV. The fuel inputs per hour of plants 1 and 2 are given as (15)

$$F_1 = 0.2p_1^2 + 40p_1 + 120 \text{ Rs. per hour}$$

$$F_2 = 0.25p_2^2 + 30p_2 + 150 \text{ Rs. per hour}$$

Determine the economic operating schedule and the corresponding cost of generation if the maximum and minimum loading on each unit is 100MW and 25MW, the demand is 180MW and transmission losses are neglected. If the load is equally shared by both units, determine the saving obtained by loading the units as per equal incremental production cost.

OR

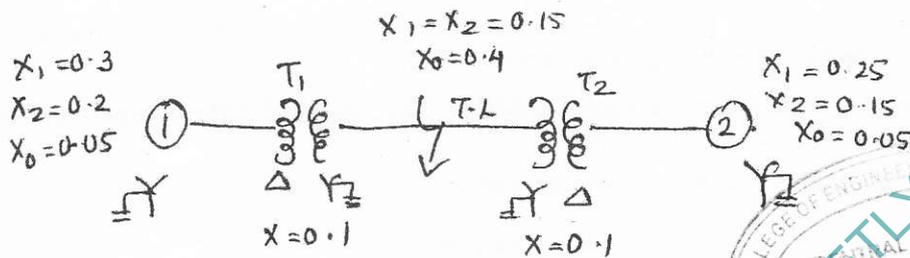
- V. (a) Explain the speed governing mechanism of turbo alternators briefly. (5)

- (b) What is optimum generation scheduling? Define penalty factor and obtain the expression for Exact coordination equation. (10)

- VI. 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. (15)

OR

- VII. A power system shown in figure has a dead short circuit at the mid point of the transmission line. Find the short circuit current for L - G fault. Assume that the motor is operating at its rated voltage. The reactance in p.u. are on the same base. (15)



- VIII. (a) Derive the swing equation of a synchronous machine. Also define inertia constant. (10)

- (b) Two turbo alternators specified below are interconnected using a short line. (5)

Machine 1 : 4 poles, 50Hz, 125MVA, 0.8 lag, 25000 Kgm<sup>2</sup>

Machine 2 : 4 poles, 50Hz, 150MVA, 0.9 lag, 20000 Kgm<sup>2</sup>

Determine the inertia constant of the single equivalent machine on a base of 150MVA.

OR

- IX. (a) What are the economic advantages of HVDC transmission? (5)

- (b) Explain: (10)

- (i) FACTS  
(ii) Types of DC links

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## B.Tech. Degree VII Semester Examination November 2013

### EE 704 CONTROL SYSTEMS II (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

(Ordinary graph sheet may be provided)

#### PART A (Answer ALL questions)

(8 × 5 = 40)

- I. (a) Explain any five essential characteristics of non-linear systems briefly.
- (b) For the system with state equations.  
 $\dot{x}_1 = x_2$   
 $\dot{x}_2 = ax_1 + bx_2 - x_1^2x_2 - x_1^3$  ( $a, b$  - constants)  
determine the possible range of  $b$ , so that no limit cycle exists.
- (c) How describing function methods are different from phase-plane analysis of nonlinear systems? Bring out the relative merits and demerits.
- (d) For a nonlinear system governed by the equations.  
 $\dot{x}_1 = -x_1 + 2x_1^2x_2$   
 $\dot{x}_2 = -x_2$   
obtain the regions of stability and instability, by Lyapunov's method.
- (e) How Routh-Hurwitz criterion can be applied to determine the stability of a sampled data control system?
- (f) Check the stability of the system with following characteristic polynomial by Jury's test.  
 $2z^4 + 7z^3 + 10z^2 + 4z + 1$ .
- (g) Define power spectral density and mention any three properties.
- (h) Define auto correlation function of a random variable and list out its properties.

#### PART B

(4 × 15 = 60)

- II. (a) For the system described by the equation  
 $\ddot{x} + 0.5\dot{x} + x = 0$  (12)  
determine the singular point and construct phase trajectory by method of isoclines; given  $x(0) = 2$ ,  $\dot{x}(0) = 0$ .
- (b) From the trajectory obtained, what can you comment on the location of eigen values of the system matrix of the above system. (3)
- OR
- III. (a) Define the following terms. (6)  
(i) Singular point  
(ii) Phase plane  
(iii) Phase trajectory  
(iv) Phase portrait
- (b) Explain the delta method for constructing phase trajectory. (9)

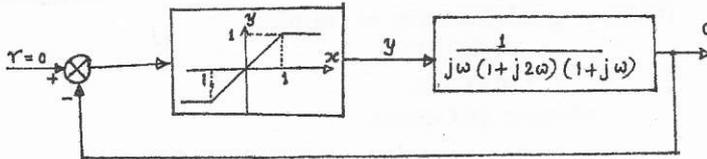
(P.T.O)

IV. Obtain the describing functions for the following nonlinearities. (15)

- (i) Relay with hysteresis and dead zone
- (ii) Relay with hysteresis
- (iii) Relay with dead zone
- (iv) Ideal relay

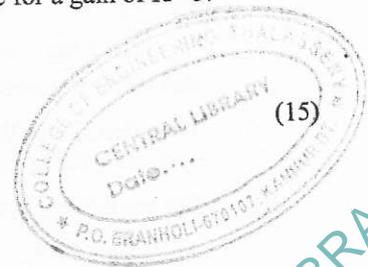
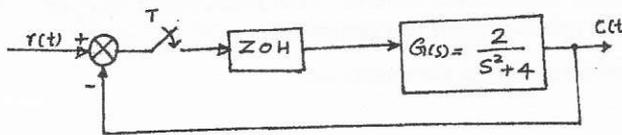
OR

V. (15)



Consider the third-order system with saturating amplifier of the above figure, having gain K in its linear region. Determine the largest value of gain K for system to stay stable. Also find the frequency, amplitude and nature of limit cycle for a gain of K = 3.

VI.



Obtain the impulse response of the above sampled data control system when,

- (i)  $T = n\pi$
- (ii)  $T = n\pi/2$ ,  $n$  - positive integer

OR

VII. (a) Determine the state model in canonical form for the discrete time system described by the difference equation (7)

$$y(k+3) - 4y(k+2) + 5y(k+1) - 2y(k) = 4u(k+2) - 7u(k+1) + u(k) -$$

(b) What is the specialty of system matrix in Jordan canonical form? (2)

(c) Briefly explain a hold circuit in a sampled data control system. Derive the transfer function of zero order hold. (6)

VIII. Explain the following terms. (15)

- (i) Stochastic process
- (ii) Gauss-Markov process
- (iii) Ergodicity

OR

IX. Explain Kalman filter algorithm and its application in state estimation problem. (15)

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## B.Tech. Degree VII Semester Examination November 2013

### EB/EE 705(A) COMPUTER COMMUNICATIONS (2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

#### PART A (Answer ALL questions)

(8 x 5 = 40)

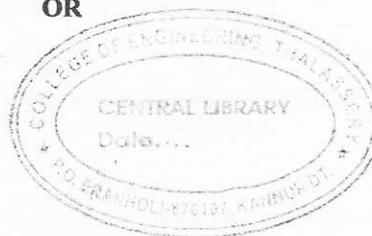
- I. (a) Give the differences between LAN and WAN.  
(b) Compare connection oriented and connection less services.  
(c) Explain Reverse Address Resolution Protocol.  
(d) Describe CSMA/CD.  
(e) Explain IP protocol.  
(f) Define Jitter control.  
(g) Explain RFC 822.  
(h) Write short note on Cryptography.

#### PART B

(4 x 15 = 60)

- II. Explain different types of Transmission Media. (15)  
OR
- III. (a) Discuss on X.25 Networks. (3)  
(b) Explain in detail the different layers in ISO/OSI reference model, specifying the interface and the service of each layer. (12)
- IV. (a) Explain 802.3 cabling. (10)  
(b) Draw different types of cable Topologies. (5)  
OR
- V (a) Explain ALOHA. (5)  
(b) Describe Multiplexing. (5)  
(c) Explain Address Resolution Protocol. (5)
- VI. (a) Explain Link State Routing. (10)  
(b) Describe the causes of congestion (5)  
OR
- VII. (a) Explain Traffic Shaping. (5)  
(b) Discuss on ATM Service categories. (7)  
(c) Explain Adaptive and Non-adaptive Routing algorithm. (3)
- VIII. (a) Explain the architecture and services of e-mail. (10)  
(b) Explain web browsers. (5)  
OR
- IX. (a) Explain PGP (Pretty Good Privacy). (10)  
(b) Explain PEM (Privacy Enhanced Mail). (5)

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## B.Tech. Degree VII Semester Examination November 2013

### EE 705 (B) HIGH VOLTAGE DC TRANSMISSION (2006 Scheme)

Time : 3 Hours

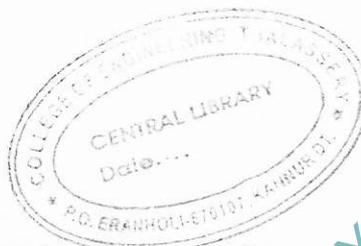
Maximum Marks : 100

#### PART A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) Explain different types of DC link configuration.  
(b) Explain the valve firing scheme with a neat diagram  
(c) Explain the following terms related to converter configuration.  
(i) Valve utilization factor  
(ii) Transformer utilization factor  
(d) Explain the effect of source reactance on converter circuit.  
(e) Explain pulse frequency control.  
(f) Write short notes on the following converter faults.  
(i) Arctrough  
(ii) Misfire  
(g) Explain the concept of DC circuit interruption.  
(h) Describe Thyristor Controlled Reactor (TCR).

#### PART B



(4 x 15 = 60)

- II. (a) Explain major components of HVDC converter station using suitable diagrams. (10)  
(b) Describe modern trends in DC transmission. (5)
- OR**
- III. (a) What are the different considerations taken into account in the design of valve? (5)  
(b) Compare AC and DC transmission system based on technical performance and reliability. Give the applications of DC transmission system. (10)
- IV. (a) Explain the rectifier characteristics of a six-pulse converter. (7)  
(b) Explain three and four valve conduction mode of a graetz circuit. (8)
- OR**
- V. (a) Explain the characteristics of a twelve-pulse bridge converter circuit. (8)  
(b) Explain the simplified analysis of graetz circuit without overlap. (7)
- VI. (a) Explain converter control characteristics. What are the two requirements which necessitates the modification of control characteristics. (8)  
(b) Explain hierarchical control structure of a DC link. (7)
- OR**
- VII. (a) Describe the principles of DC link control. (7)  
(b) Explain over voltages in a converter station and protection against over voltages. (8)
- VIII. (a) Explain potential application and types of multi terminal DC system. (10)  
(b) Write short notes on DC line insulation. (5)
- OR**
- IX. (a) Describe the philosophy and tools of HVDC system simulation. (6)  
(b) What are the sources of reactive power in a HVDC system and how it can be eliminated? (9)

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