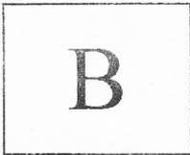


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B.Tech. Degree VII Semester Examination November 2014

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

Time : 3 Hours

Maximum Marks : 100

PART A
(Answer *ALL* questions)

(8 x 5 = 40)

- I. (a) Compare formal and informal organizations.
(b) Briefly explain the objectives of co-operative organizations.
(c) List out the characteristics of management.
(d) What are the contributions of Gilbreth?
(e) Explain about market segmentation.
(f) Explain standard costing.
(g) What are the functions of materials management?
(h) Briefly explain about materials requirement planning.

PART B

(4 x 15 = 60)

- II. Explain different types of organization structures. (15)

OR

- III. (a) What is a joint stock company? Compare private and public limited companies. (8)
(b) Explain the merits and demerits of public sector organizations. (7)
- IV. (a) Explain the levels of management. What are the skills required at different levels? (9)
(b) Explain Neo-classical management theory. (6)

OR

- V. Explain the functions of management. (15)
- VI. Discuss the principles of personnel management. (15)

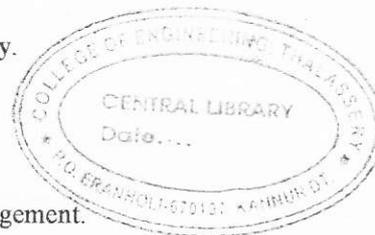
OR

- VII. (a) Differentiate between consumer and industrial markets. (6)
(b) Explain the basics of financial accounting. (9)
- VIII. (a) Differentiate between production and productivity. (5)
(b) A company requires 20,000 units of raw materials costing Rs.20 per unit. The cost of placing an order is Rs.500 and the carrying costs are 10% per year per unit of the average inventory. Determine (i) economic order quantity (ii) cycle time and (iii) total variable cost of managing the inventory. (10)

OR

- IX. (a) Explain the measurement of productivity. (6)
(b) Explain the objectives of storekeeping. (9)

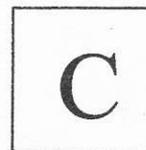
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B.Tech. Degree VII Semester Examination November 2014

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 is a service connection? Draw the scheme for giving service connection to a domestic consumer having connected load more than 25KW.
- (b) Discuss how the equipment earthing provides protection against electric shock.
- (c) Explain the working of a mercury vapour lamp with the help of a neat sketch.
- (d) What are the primary purposes of providing lighting in offices and industrial plants?
- (e) Explain how the ratings of cables and fuses are decided for motor installation.
- (f) Explain the concept of zone of protection in lighting.
- (g) Draw the single line diagram of a pole mounted substation, indicating the various protective devices installed on the HT and LT sides.
- (h) Draw the plate earthing system as specified in IS:3043-1966.

PART B

(4 × 15 = 60)

- II. Explain the arrangement of a three phase four wire distribution board with bus-bar arrangement, for a typical chemical industry, details of which are given below with the help of a neat schematic sketch. (15)

Incomer

– Three phase, four wire incomer from the meter board.

8 outlets

- (i) Distribution fuse board for lighting
- (ii) TP & N fuse board for cell house
- (iii) TP & N fuse board for brine plant
- (iv) TP & N fuse board for air compressor plant
- (v) TP & N fuse board for acid plant
- (vi) TP & N fuse board for Boiler Plant
- (vii) TP & N Fuse Board for water treatment plant
- (viii) TP & N fuse board for acid storage

OR

- III. Write short notes on:

(5×3=15)

- (a) HRC Fuse
- (b) Sub circuits
- (c) Difference between neutral wire and earth wire
- (d) Earthing of domestic fittings and appliances
- (e) Factors determining the selection of LT power cables

(P.T.O.)



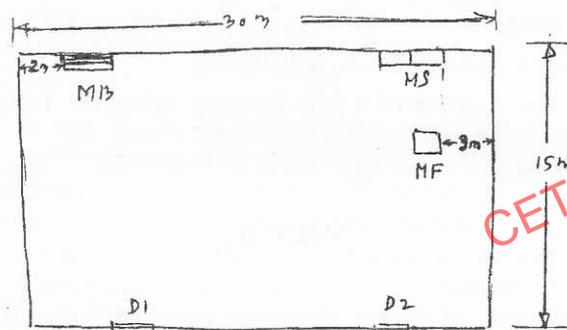
- IV. Explain the important electrical aspects and considerations specified in the National Electrical Code for the following: (3x5=15)
- (a) Lift and escalator services
 - (b) Stand by generators
 - (c) Medical establishments

OR

- V. An office 30m x 15 is to be illuminated by twin 40W fluorescent luminaires of lument output 5600 lumens. The lamps being mounted at a height of 3m from the work place, the average illumination required is 240 lux. Calculate the number of lamps required to be fitted in the office, assuming the coefficient of utilization to be 0.6 and maintenance factor to be 0.8. Also calculate the number of such circuits required. (15)
- VI. (a) What is a high rise building? Discuss the important provisions to be followed in electrification of high rise buildings. (10)
- (b) Draw the schematic diagram of a lightning protection scheme for a typical seven storied residential flat. (5)

OR

- VII. A 15 hp (metric), 415V, three phase, 50Hz 1440 rpm, squirrel cage induction motor has to be installed in a workshop. Plan of the workshop is given below. Positions of the main switch (MS) motor switch with starter (MS) and motor foundation (MF) are shown. Draw the wiring diagram and prepare the quantity of the material required. Assume the efficiency of motor as 85% and the height of motor foundation as 0.5 from the ground level. (15)



- VIII. A substation has to be installed in a residential complex having a load of 80 KVA, taking the supply from the nearby 11 KV line. Select the type of substation and make a list of materials required. (15)

OR

- IX. Design a 110KV/11KV substation suitable for an industry, load details of which are given below. 11 KV distribution is used to feed power to different process plants located inside the factory premises. (15)

Load details

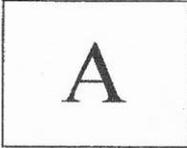
- (a) Two process plants - 5000 KW each
- (b) Four process plants - 750 KW each
- (c) Two process plants - 1500 KW each

Draw the schematic diagram and physical layout. Prepare an estimate the quantity of materials required for the installation. Assume the power factor to be 0.8 and load factor to be 0.6.

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B.Tech. Degree VII Semester Examination November 2014

EE 703 POWER SYSTEM II

(2006 Scheme)

Time : 3 Hours

Maximum Marks : 100

PART A
(Answer ALL questions)

(8 x 5 = 40)

- I. (a) What are the different types of buses?
- (b) Discuss the advantage of using Y bus model of power system network for load flow analysis.
- (c) Explain speed governing mechanism.
- (d) What do you mean by automatic voltage regulation?
- (e) What are the different types of fault which occur in a power system?
- (f) What are the symmetrical components of $IA = 10\angle 0^\circ$, $IB = 10\angle -120^\circ$ and $IC = 10\angle -240^\circ$?
- (g) What are the economic advantages of HVDC transmission?
- (h) Distinguish between steady state and transient stability.

PART B

(4 x 15 = 60)

- II. Draw the flow chart for load flow solution by Gauss-Scidal iterative method and explain. (15)

OR

- III. A 3 bus system is given in figure. The ratings of various components are listed below: (15)

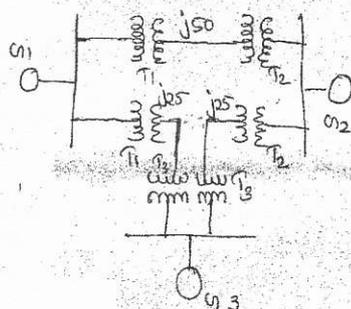
G_1 -50MVA, 13.8 KV, $X^{11} = .15pu$

G_2 -40MVA, 13.2 KV, $X^{11} = .2 pu$

G_3 -30MVA, 11 KV, $X^{11} = .25 pu$

T_1 -45MVA, 11KV/110 KV Y/Y

$X = 0.1pu$



$T_2 = 25MVA, 12.5KV/115KV Y/Y, X = .15pu$

$T_3 = 40MVA, 12.5 KV/115KV Y/Y X = 0.1pu$

Determine the reactance diagram based on 50MVA & 13.8 KV as base quantities in G_1 .

(P.T.O.)

- IV. Derive expressions for economic distribution of load between generating units considering the effect of transmission losses. (15)

OR

- V. A power system with two generating stations supplied a total load of 300MW. Neglecting transmission losses the economic schedule for the plant generation is 175MW & 125MW. Find the saving in the production cost in Rs/hr due to this economic schedule as compared to equal distribution of the same load b/w the two units. The incremental costs are:

$$\frac{dc_1(P_1)}{dp_1} = 30 + 0.3P_1$$

$$\frac{dc_2(P_2)}{dp_2} = 32.5 + 0.4P_2$$

- VI. (a) Derive the necessary equation to determine the fault current and line to line voltage for a line to line fault. (10)
(b) Explain the important rating of circuit breaker. (5)

OR

- VII. A 3ϕ , 6.9kV, 10MVA alternator has $X_1 = X_2 = 15\%$. The neutral is grounded through a reactor of 0.381Ω . Find the subtransient current in the faulted phase, when a single line to ground fault takes place. (15)

- VIII. (a) Derive the swing equation of a synchronous machine. Also define inertia constant. (10)
(b) Explain Flexible AC transmission systems. (5)

OR

- IX. Write short notes on : (15)
(i) Methods of improving transient stability
(ii) HVDC.

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B. Tech. Degree VII Semester Examination November 2014

EE 704 CONTROL SYSTEMS II (2006 Scheme)

Time: 3 Hours

Maximum Marks: 100

PART A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) How are the nonlinearities classified? Give examples.
(b) List the characteristics of nonlinear systems.
(c) How is the stability of a nonlinear system determined using describing function analysis?
(d) What is the difference between phase plane and describing function of analysis?
(e) State sampling theorem and mention the advantages of sampled data control systems.
(f) Find the inverse z-transform of (i) $\frac{z^2}{z^2 - z + 0.5}$ (ii) $\frac{8z - 19}{z^2 - 5z + 6}$.
(g) Define auto correlation and list its properties for a stochastic process.
(h) What is an ergodic process?

PART B

- II. (a) What is singular point? Explain the classification of singular points. (10)
(b) Explain Bendixson's criteria. (5)

OR

- III. (a) Explain the construction of phase trajectory using the method of isoclines. (10)
(b) Define limit cycle. How is stable and unstable limit cycle determined using phase portrait? (5)

- IV. (a) Derive the describing function of saturation nonlinearity. (10)
(b) Check whether the nonlinear system given below is stable or not using Lyapunov's method. (5)

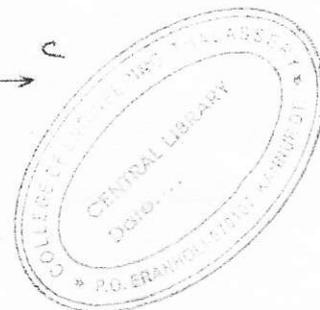
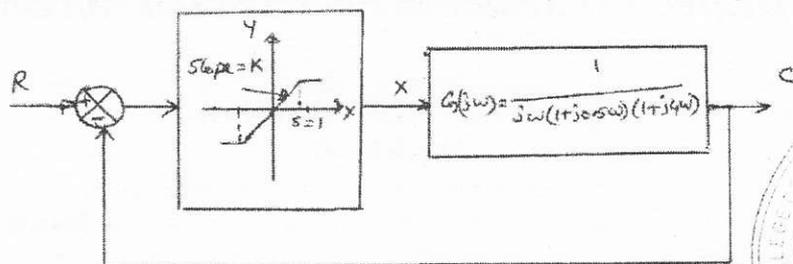
$$\dot{x}_1 = x_2 - x_1(x_1^2 + x_2^2)$$

$$\dot{x}_2 = -x_1 - x_2(x_1^2 + x_2^2)$$

OR

(P.T.O.)

- V. Consider a unity feed back system shown in figure having a saturating amplifier with given K. Determine the maximum value of K for the system to stay stable. (15)



- VI. (a) Define pulse transfer function and derive the transfer function of a linear discrete time system. (8)
 (b) Explain the significance of hold circuit in a sampled data control system. Derive the transfer function of a zero order hold circuit. (7)

OR

- VII. (a) What is state transition matrix of a discrete time system? Give its properties. (5)
 (b) Determine the stability by using Jury's stability analysis of the system whose characteristic equation is $z^4 - 1.7z^3 + 1.04z^2 - 0.268z + 0.024 = 0$. (10)

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- VIII. (a) Define power spectral density and mention its properties. (7)
 (b) Explain how the Wiener filter is used to produce minimum mean square error estimate. (8)

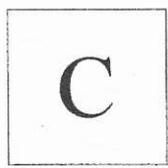
OR

- IX. (a) Explain how Kalman filter is used in state estimation. (10)
 (b) Explain Markov process. (5)

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B. Tech. Degree VII Semester Examination November 2014

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) Write a short note on types of DC links.
- (b) Briefly discuss dielectric and operational tests performed in thyristor valves.
- (c) Draw and explain Graetz circuit.
- (d) Explain the functions of smoothing reactor.
- (e) Explain modifications of control characteristics.
- (f) What are the steps for deenergizing a bridge from N series connected bridge at a converter station.
- (g) Write a short note on different types of multiterminal DC system.
- (h) Explain philosophy and tools used for HVDC system simulation.

PART B

(4 x 15 = 60)

- II. (a) Compare AC and DC transmission system based on economics of transmission, technical performance and reliability. (10)
- (b) Briefly explain thyristor valve protection schemes. (5)
- OR**
- III. (a) Draw the schematic diagram of a typical HVDC converter station and explain various components. (10)
- (b) Briefly explain about thyristor valve firing scheme. (5)
- IV. (a) Derive the expression for valve rating and transformer rating for a converter configuration. (8)
- (b) For a 12 pulse converter with $q = 4$, $s = 3$, $r = 1$, calculate the maximum DC power and transformer rating if PIV rating of the valve is 'v' and the rms current rating is 'I'. Rework the problem if $q = 3$, $s = 4$, $r = 1$. (7)
- OR**
- V. Explain 2 and 3 valve conduction mode operation of Graetz circuit and derive the expression $V_d = V_{do} \cos \alpha - R_c I_d$. (15)
- VI. Explain different types of faults occur in a converter. (15)
- OR**
- VII. Explain system control hierarchy and what are the different methods adopted for firing angle control. (15)
- VIII. What are the main problems associated with DC lines? Explain different protection methods adopted in DC lines. (15)
- OR**
- IX. What are the different sources of reactive power to meet the reactive power requirement of converters? (15)