

Total No. of Printed Pages:2

**SUBJECT CODE NO:- H-474**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**B.E. (EEP/EE/EEE)**  
**Elective-I: Industrial Management**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- 1) Q.No.(1) and (6) are compulsory.
  - 2) Attempt any two Question from remaining.

**Section A**

- |     |  |                     |
|-----|--|---------------------|
| Q.1 | Attempt any five among following.  | 10                  |
|     | <ol style="list-style-type: none"> <li>(a) Define Management &amp; roles</li> <li>(b) What is Network concept &amp; Techniques</li> <li>(c) Principles of HRM.</li> <li>(d) Principles of Material Management.</li> <li>(e) What is wealth Maximization.</li> <li>(f) What is profit Maximization.</li> <li>(g) What is mission / vision of any organization.</li> <li>(h) What is NEED/Expectation.</li> <li>(i) What is customer as per Mahatma Gandhi.</li> </ol> |                     |
| Q.2 | <ol style="list-style-type: none"> <li>(a) What is transformation in Manuf. system &amp; how product is value added.</li> <li>(b) Discuss Management in Art and Science. Why Managers are required in Organization.</li> </ol>   | <p>07</p> <p>08</p> |
| Q.3 | <ol style="list-style-type: none"> <li>(a) What is project management &amp; how Network analysis techniques argument it smoothly and timely.</li> <li>(b) What is need for plant layout and how it acts as a catalyst in better production concept &amp; material handling.</li> </ol>   | <p>07</p> <p>08</p> |
| Q.4 | <ol style="list-style-type: none"> <li>(a) Explain Principles of Good H.R. Policy &amp; procedure of recruitment.</li> <li>(b) What are purchases and its principles with objectives to reduce cost of product / services.</li> </ol>  | <p>08</p> <p>07</p> |
| Q.5 | <ol style="list-style-type: none"> <li>(a) What is marketing management. How Market research helps in good Marketing &amp; Customer feedback.</li> <li>(b) What is Decision making and elaborate management steps to arrive.</li> </ol>  | <p>07</p> <p>08</p> |

## Section B

- Q.6 Attempt any five from following. 10
- 1) Write Law of demand & supply.
  - 2) Write Indian factory act.
  - 3) List out function under OR
  - 4) TQM
  - 5) List out Quality obstacle
  - 6) Quality
  - 7) Inventory
  - 8) What is economics.
- Q.7 (a) Explain different buying techniques & Write criteria's while buying 07  
(b) Write down elements of MIS & discuss on any three in details. 08
- Q.8 (a) Explain the use LPP in operation research. 08  
(b) What is customer satisfaction and how to distinguish the various roles of customer. 07
- Q.9 (a) List out ISO requirement principles & explain system approach concept. 08  
(b) Write Indian Electricity Act & discuss about its limitations on working environment. 07
- Q.10 (a) How to overcome transportation problem by operation research. 08  
(b) Explain ISO registration benefits and its certification enhances branding. 07

Total No. of Printed Pages:2

**SUBJECT CODE NO: H-492**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**B.E. (EEP/EE)**  
**Power System Dynamics & Stability**  
**(OLD)**

[Time: Three Hours]

[Max.Marks:100]

N.B Please check whether you have got the right question paper.

- N.B i) Attempt any three questions from each section.  
 ii) Assume suitable additional data wherever necessary.

**Section A**

- Q.1 a) Derive and explain swing equation. 08  
 b) A synchronous generator feeds 1.0 pu power to an infinite bus via a transmission system (double circuit line). A fault occurs on one line which reduces the maximum power transfer to 0.5 pu, Whereas before the fault the power was 2.0 pu and after clearance of fault 1.5 pu. By the use of equal area criterion determine critical cleaning angle. The losses are neglected. 08
- Q.2 a) Explain & Derive equal area criterion. 08  
 b) Find critical cleaning angle for a system having maximum power transfer capacity of 2.0 pu & delivering 1.0 pu. A fault occurred which reduced the maximum power transfer capacity by 0.6 pu and after clearing fault the maximum power transferable capacity is 1.5 pu. 08
- Q.3 a) Explain with help of equal area criterion the stability effect on sudden losses of one of parallel lines for a system where a single machine tied to infinite bus through two parallel lines. 08  
 b) Explain the effect of grounding on stability of system. 08
- Q.4 a) What is effect of clearing time on stability & determine expression for critical clearing time. 08  
 b) Explain classical model of multimachine system & discuss its limitations. 08
- Q.5 Write short notes on. 18  
 i) Modelling of synchronous machine  
 ii) Power angle curve  
 iii) Reclosing effect on stability

**Section B**

- Q.6 a) Explain the construction of Clarkes diagram for the equivalent –  $\Pi$  of which impedance & pillars each. 08  
 b) A synchronous generator having an internal reactance 0.8 pu connected to an infinite bus through a series reactance of 1 pu. The terminal voltage of generator is held at 1.5pu & voltage of infinite bus at 1 pu. Find steady state stability using Clarke's diagram. 08
- Q.7 a) Explain supplementary modulation control of facts devices. 08  
 b) With help of neat sketch explain any two excitation configuration. 08

- Q.8 a) Explain how facts devices used to improve the power system stability. 08  
 b) Explain the operation & necessity of AVR. 08
- Q.9 a) Explain point by point method for determination of stability. 08  
 b) Find critical clearing angle by using step by step method. Initial power transfer 1 pu at 50 Hz 08  
 maximum power limit under Pre fault, during fault & post fault conditions are 2.6 pu, 0.8 pu  
 and 2 pu respectively if the inertia constant of generator is 5 MJ/MVA. Plot the curve for a  
 time of 0.3 sec and time interval to be 0.05 sec and assume fault occurred at 0 sec & cleared  
 at 0.1 sec.
- Q.10 Write short notes on 18  
 i) Power system stabilizer  
 ii) Effect of damping on the system stability  
 iii) Transient stability controller

Total No. of Printed Pages:2

**SUBJECT CODE NO:- H-150**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**B.E. (EEP/EE/EEE)**  
**Power System Operation & Control**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
1. Q.No.1 from section A and Q.No.6 from section B are compulsory.
  2. Attempt any two questions from the remaining questions in each section
  3. Assume suitable data whenever necessary.

## Section A

- |     |   |          |
|-----|---|----------|
| Q.1 | Solve any five questions.   | 10       |
|     | <ol style="list-style-type: none"> <li>a) Define the direct and quadrature axes.</li> <li>b) What are the significance of dq0 transformation.</li> <li>c) Define inertia constant of synchronous machine.</li> <li>d) Draw electrical analog circuit of hydraulic turbine.</li> <li>e) Classify stability of dynamic system.</li> <li>f) Define reliable power system.</li> </ol> |          |
| Q.2 | <ol style="list-style-type: none"> <li>a) Derive the equations for electrical power and torque in terms of dqo components.</li> <li>b) Explain simplified model of synchronous machine with amortisseurs neglected.</li> </ol>  | 08<br>07 |
| Q.3 | <ol style="list-style-type: none"> <li>a) Explain elements of excitation system with help of functional block diagram.</li> <li>b) Explain classical transfer function of hydraulic turbine with its special characteristics.</li> </ol>  | 08<br>07 |
| Q.4 | <ol style="list-style-type: none"> <li>a) Explain the classical model of single machine infinite bus system.</li> <li>b) Explain state space representation in stability of dynamic system.</li> </ol>  | 08<br>07 |
| Q.5 | Write short note on the following:  | 15       |
|     | <ol style="list-style-type: none"> <li>a) Park`s transformation</li> <li>b) Armature and field structure of synchronous machine.</li> <li>c) Requirement for a transient droop in governor for hydraulic turbine.</li> </ol>  |          |

## Section B

Q.6 Solve any five questions.

10

- What is economic load dispatch
- What is load frequency control
- What is synchronous condenser
- Define long term hydro scheduling problem.
- What is shunt reactor?
- What is optimum scheduling of hydrothermal system?

Q.7 a) Explain and derive the expression for long term hydrothermal scheduling. 08  
 b) A constant load of 300 mw is supplied by two 200mw generators whose incremental fuel costs are given by 07

$$\frac{dC_1}{dP_{G_1}} = 0.20p_{G_1} + 40$$

$$\frac{dC_2}{dP_{G_2}} = 0.25P_{G_2} + 30$$

And  $P_{G_{1min}} = 20mw$   
 $P_{G_{2min}} = 125 mw$

With power PG in MW and cost c in RS/hr. determine:

- The most economical division of load between the generators.
- The saving in Rs/day there by obtained compared to equal load sharing between the generators.

Q.8 a) Explain any four methods of voltage control in details. 08  
 b) Explain production and absorption of reactive power in system equipment 07

Q.9 a) Explain power system security assessment in details. 08  
 b) Explain the different power system operating states with the help of schematic diagram and also 07  
 Explain evaluation system state by contingency analysis.

Q10 Write down short note on. 15

- Application of tap changing transformers.
- Distribution system voltage regulation.
- Role of SCADA system in energy management system.

Total No. of Printed Pages:02

**SUBJECT CODE NO:- H-116**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**B.E. (EEP/EE/EEE)**  
**High Voltage Engineering**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
1. Question.No.1 & Question No.6 are compulsory.
  2. Attempt any two questions from remaining questions of each section.
  3. Assume suitable data wherever necessary.
- “SECTION-A”**
- Q.1 Solve any five. 10
- a) Define the types of collision processes.
  - b) Explain in short the term ‘electron attachment’.
  - c) What are electronegative gases?
  - d) State electrical properties of liquid dielectrics.
  - e) State the application of insulating material in power cables.
  - f) What is difference between insulation and dielectrics?
  - g) What is treeing and tracking?
  - h) State applications of insulating materials.
- Q.2 07
- a) Explain the procedure to control electric field intensity in HV equipment.
  - b) Discuss the ‘Charge Simulation Method’ for solving Field Problems and estimation of potential distribution. 08
- Q.3 07
- a) Describe the current growth phenomenon in a gas subjected to uniform electric fields.
  - b) What is Paschen’s law? Explain in details. 08
- Q.4 07
- a) Discuss the factors that influence conduction in pure liquid dielectrics and in commercial liquid dielectrics.
  - b) What are the common liquid insulants used in an electrical apparatus? Briefly give their physical properties. 08
- Q.5 07
- a) What is ‘thermal breakdown’ in solid dielectrics, and how is it practically more significant than other mechanisms?
  - b) Explain the phenomenon ‘treeing and tracking’ in solid insulating materials under electrical stress. How does it lead to breakdown? 08

## "SECTION-B"

- Q.6 Solve any five. 10
- State different forms of high voltages.
  - Draw the circuit diagram of full wave rectifier.
  - What are the limitations of series resistance micrometer?
  - Draw schematic diagram of a generating voltmeter (rotating vane type).
  - Draw the circuit diagram of capacitance potential divider.
  - List out the different theories of charge formation in clouds.
  - Define creepage distance.
  - What is loss tangent?
- Q.7
- Explain with diagrams, different types of rectifier circuits for producing high dc voltages. 07
  - What is a Tesla coil? How are damped high-frequency oscillations obtained from the Tesla coil? 08
- Q.8
- Discuss briefly the different methods of measuring high dc voltages. What are the limitations of each method? 07
  - Explain different methods of high current measurements with their relative merits and demerits. 08
- Q.9
- Explain the different theories of charge formation in clouds. 07
  - What is a surge arrester? Explain its function as a shunt protective device. 08
- Q.10
- Define 'complex permittivity'. What are the factors that govern the quantities 'relative permittivity' and 'loss factor'? 07
  - Discuss the different electrical tests done on isolators and circuit breakers. 08



Total No. of Printed Pages:3

**SUBJECT CODE NO:- H-307**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**B.E. (EEP/EE/EEE)**  
**Electrical Drives**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks: 80]

Please check whether you have got the right question paper.

- N.B
1. Q.1 and Q.6 are compulsory.
  2. Solve any two questions from Q.2 to Q.5 and any two questions from Q.7 to Q.10.
  3. Assume suitable data if required.

## Section A

- Q.1 Attempt any Five. 10
- a) What is an electric drive?
  - b) What is meant by load equalization?
  - c) What are the basic elements of Electric drives?
  - d) What are the functions of Power Modulator?
  - e) What are the advantages of closed loop system?
  - f) What do you mean by Constant-torque?
- Q.2
- a) With neat block diagram explain the functions of essential parts of electrical drives. 08
  - b) Derive the fundamental torque equation and explain the significance of each term. 07
- Q.3
- a) How does a phase locked loop speed control scheme operate? Where do you use it? 07
  - b) A weight of 500kg is being lifted up at a uniform speed of 1.5m/s by a winch driven by motor running at a speed of 1000rpm. The moments of inertia of the motor and winch are 0.5 and 0.3 kg-m<sup>2</sup> respectively. Calculate the motor torque and the equivalent moment of inertia referred to the motor shaft. In the absence of Height, motor develops a torque of 100N-m when running at 1000rpm. 08
- Q.4
- a) What is the Principle of regenerative braking? How DC chopper is used for regenerative braking of d.c.motor. 07
  - b) A 220v, 50A, 800rpm separately excited d.c.motor is controlled by a chopper with an input voltage of 230v and frequency of 50Hz. Assuming continuous conduction calculate 08
    - i. Duty ratio of chopper for rated torque and the speed of 500r.p.m.
    - ii. What will be the maximum allowable speed of motor, if chopper has duty of 0.9 and maximum allowable motor current is twice the rated current?

Take  $R_a = 0.4\Omega$ .

- Q.5 Write short notes on.
- i. Different components of Lord torque. 05
  - ii. Four quadrant operation of electric drive. 05
  - iii. Dynamic braking of D.C. drive. 05

Section B

- Q.6 Attempt any Five. 10
- a) What are the three regions in the speed-torque characteristics of the induction motor?
  - b) What is meant by Soft start?
  - c) What are the disadvantages of induction motor operation with unbalanced supply voltage?
  - d) Mention the two modes employed in variable frequency control of synchronous motor drive.
  - e) Mention the Special feature of BLDC motor.
  - f) Give the some applications of synchronous motor drives.

- Q.7 a) Explain rotor resistance control using diode rectifier and chopper in induction motor. 07
- b) A 440v, 3-phase, 50Hz, 6pole, 1000rpm, delta connected Induction motor has 08  
 following parameters referred to the stator.  
 $R_s = 2\Omega, R'_r = 2\Omega, X_s = 4\Omega, X'_r = 5\Omega$ .  
 It runs at rated speed when driving a fan load at rated voltage. The motor is controlled by stator voltage control.  
 Determine
- i. Motor terminal voltage.
  - ii. Motor current.
  - iii. Motor torque.
- For Motor speed of 800rpm.

- Q.8 a) Explain how variable frequency control from a current source can be obtained in 3 $\phi$  08  
 induction motor drives.
- b) Describe the operation of self-controlled synchronous motor drive employing load 07  
 commutated inverter.

- Q.9 a) Explain the operation of brush less d.c.motor drive and its applications. 07
- b) A 6MW, 3-phase, 11kv, Y-connected, 6-pole, 50Hz, 0.9(leading) power factor 08  
 synchronous motor has  $X_s = 9\Omega$  and  $R_s = 0$ . Rated field current is 50A. Machine is controlled by variable frequency control at constant (V/F) ratio up to the base speed and at constant V above base speed. Determine
- i. Torque and field current for the rated armature current, 750rpm and 0.8 leading power factor.

Q.10

Write short notes on.

- a) (V/F) control of Induction motor.
- b) Operation with unbalanced rotor impedance.
- c) Synchronous motor drive.

05  
05  
05

Total No. of Printed Pages:2

**SUBJECT CODE NO:- H-289**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**B.E. (EEP/EE/EEE)**  
**Elective-II: Control System – II**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

N.B

1. Q. No.1 and Q. No.6 are Compulsory
2. Attempt any Two from remaining from Section-A & Section –B.

## Section A

- Q.1 Solve any FIVE 10
- (a) Write the properties of State transition matrix
  - (b) What is meant by diagonalization?
  - (c) What is State observer?
  - (d) Explain the concept of sampling process
  - (e) Write the state model of  $n^{\text{th}}$  order system
  - (f) What is pulse transfer function?
- Q.2 Find the state transition matrix  $\Phi(t)$  for a system whose state matrix is given 15
- $A = \begin{bmatrix} -5 & -1 \\ 3 & -1 \end{bmatrix}$  using
- 1) Cayley Hamilton method
  - 2) Laplace Transform method
- Q.3 (a) What are the necessary and sufficient conditions for arbitrary pole placement? 08  
(b) Define stability of a digital control system and discuss how Jury-stability criterion is applied for stability investigation for such systems. 07
- Q.4 Find the one sided z-transform of the discrete sequences generated by mathematically sampling the following continuous time functions. 15
- (a)  $t^2$
  - (b)  $\sin wt$
- Q.5 Write short note on 15
- (a) Diagonalization
  - (b) Pulse transfer function
  - (c) State transition matrix.

## Section-B

- Q.6 Answer any five 10
- Write any two properties of nonlinear systems?
  - Define Lyapunov Stability
  - Differentiate classical and fuzzy set.
  - What is a fuzzy relation?
  - Define Learning. What are the different types of Learning?
  - Enlist different activation function used in Artificial Neural Network(ANN)
- Q.7 08
- Explain saturation and backlash nonlinearity with necessary diagram.
  - Explain Lyapunov's Direct method. 07
- Q.8 08
- Explain supervised and unsupervised Learning
  - List out the differences between Artificial Neural Network and Biological Network. 07
- Q.9 For given fuzzy set 15
- $$\tilde{A} = \left\{ \left( \frac{0.2}{P_1} \right) + \left( \frac{0.6}{P_2} \right) + \left( \frac{0.5}{P_3} \right) + \left( \frac{0.9}{P_4} \right) \right\}$$
- $$\tilde{B} = \left\{ \left( \frac{0.4}{g_1} \right) + \left( \frac{0.7}{g_2} \right) + \left( \frac{0.8}{g_3} \right) \right\}$$
- Find  $\tilde{C} = \tilde{A} \times \tilde{B}$  using max-min composition
- Q.10 Write short notes on 15
- Jump Resonance
  - Fuzzy set Theory and operations
  - Lyapunov function

Total No. of Printed Pages:02

**SUBJECT CODE NO:- H-251**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**B.E. (EEP/EE/EEE)**  
**Elective-II Electrical System Planning & Design**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks: 80]

Please check whether you have got the right question paper.

- N.B
- i) Answer to the sections must be written in same answer book.
  - ii) Question no 1 and Questions No. 6 are compulsory
  - iii) Attempt any two questions from remaining question of each section.

**Section A**

- Q.1 Solve any five question 10
- a) Give the symbols used for circuit elements.
  - b) Define Earthing and what are types of it?
  - c) What are the needs of electrical symbols as per ISI?
  - d) What are difference between voltmeter and PT, ammeter and CT?
  - e) Define the terms lumen and Lux.
  - f) Give the difference between joint box system and looping in system.
  - h) Enlist the different types of lighting arrangement.
- Q.2 a) Explain the working principle of alarm circuit without relays. 08  
 b) With example, Explain the difference between schematic diagram and circuit diagram. 07
- Q.3 a) Explain the process of testing of electrical installations. 08  
 b) What are the difference types of service connections and what modification you suggest? If utility distribution system is under grounded. 07
- Q.4 a) Explain various types of light sources. 08  
 b) An office 30m × 15m is illuminated by 40 watt florescent lamp of lumen output 2700 lumens. The average illuminations required at the work place is 200 Lux, calculate the number of lamps required to be fitted in the office. Assuming good atmospheric conditions as well as dusty and dirty atmospheric. 07
- Q.5 Write a short note. 05
- a) Types of Earthing 05
  - b) Practical lighting schemes 05
  - c) Significance of low earth resistance. 05

**Section B**

- Q.6 Answer any five questions 10
- a. Give the line diagram showing the different substations in a power system.
  - b. List out the types of subtitling.
  - c. What is the criterion for determining the size of conduit for electrical wiring?
  - d. What is PFC and APFC?

- e. Define relay and overload relay.
- f. List out the motor control methods for starting and stopping.
- g. Write the single line diagram of a pole mounted distribution substations.
- h. What do you mean by limit and float switches?

Q.7	a) State the reasons for establishing substations mention the names of various types of substations.	08
	b) In a village residential load of 10KW agricultural load of 25 HP and water works of 15HP has to be electrified. Select the types of substations to be erected make a list metered required for the installations of proposed substation.	07
Q.8	a) Explain the general requirements for the electrical installation of small industries.	08
	b) Explain estimating and costing of electrical installations.	07
Q.9	a) With neat diagram explain the manual star/ delta starter	08
	b) Explain the contactor relay logic control circuit components.	07
Q.10	Write a short note on	
	a) No and NC contacts and their uses.	05
	b) Auxiliary contacts inter locking?	05
	c) Jogging or Inching circuit for 3- $\phi$ induction motor and its applications.	05

Total No. of Printed Pages:2

**SUBJECT CODE NO:- H-187**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**B.E. (EEP/EE/EEE)**  
**Renewable Energy**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks: 80]

Please check whether you have got the right question paper.

N.B

- i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
- ii) Attempt any two questions from the remaining questions in each section
- iii) Assume suitable data, if necessary.

**Section A**

- |     |  |          |
|-----|--|----------|
| Q.1 | Solve any five.  | 10       |
|     | <ol style="list-style-type: none"> <li>a) What is BTU?</li> <li>b) How efficiency of the solar cooler can be increased.</li> <li>c) Which fuel is used in the nuclear reactor?</li> <li>d) What are wind farms?</li> <li>e) What is biomass? Is it considered as a steady source of energy?</li> <li>f) What s biogas?</li> <li>g) Which insulating materials are used in a solar collector?</li> <li>h) What is the application of pyrhelimeter?</li> </ol> |          |
| Q.2 | <ol style="list-style-type: none"> <li>a) With neat diagram explain the principle, construction and working of flat plate solar thermal, collector.</li> <li>b) Define solar radiation and explain in details measurement of solar radiation.</li> </ol>   | 08<br>07 |
| Q.3 | <ol style="list-style-type: none"> <li>a) Explain wind power generation? What are the advantages of wind power generation? Explain how wind energy is converted into electrical energy.</li> <li>b) Describe vertical axis wind turbine machine.</li> </ol>  | 08<br>07 |
| Q.4 | <ol style="list-style-type: none"> <li>a) Write the classification of renewable and non-renewable energy sources in details.</li> <li>b) Explain the principle of photovoltaic cell. Draw VI characteristics of solar cell.</li> </ol>   | 08<br>07 |
| Q.5 | <ol style="list-style-type: none"> <li>a) Explain the fuel cells with their electrical characteristics.</li> <li>b) What is thermionic convertor? Explain it in details.</li> </ol>  | 08<br>07 |



**Section B**

- Q.6 Answer any five. 10
- a) What is wave energy? And tidal energy?
  - b) What is geothermal power
  - c) What is the function of aerobic digestive
  - d) What is solar dryers
  - e) What is fuel cell?
  - f) What is biomass plant?
  - g) Write the application of biomass energy.
- Q.7 08
- a) Explain geothermal energy? Explain the application of geothermal energy.
  - b) What is gasifier? What are the main applications of gasifier? 07
- Q.8 08
- a) Explain the various methods of biomass conversion process.
  - b) Explain the advanced type of biogas with its application and advantages. 07
- Q.9 08
- a) Explain the OTEC open cycle
  - b) Explain the concept of tidal power generation in details. 07
- Q.10 08
- a) Explain the working of open cycle type MHD power plant in details
  - b) What is Hall Effect? Explain the principle of MHD generation. 07

Total No. of Printed Pages:2

**SUBJECT CODE NO: H-410**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**B.E. (EEP/EE/EEE)**  
**Industrial Automation**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

N.B

1. Q.1 & Q.6 compulsory.
2. Solve any two questions from remaining from each section.
3. Solve total 3 questions from each section.

**Section A**

- |     |   |          |
|-----|---|----------|
| Q.1 | Solve <u>any five</u>   | 10       |
|     | <ol style="list-style-type: none"> <li>a) What is meant by discrete &amp; continuous variable?</li> <li>b) List out four input &amp; output devices used with PLC.</li> <li>c) What are serial standards used for serial communication with PLC.</li> <li>d) Draw basic control loop cycle diagram.</li> <li>e) How the actuators are categorized?</li> <li>f) What is the role of sensor in the automation?</li> </ol> |          |
| Q.2 | <ol style="list-style-type: none"> <li>a) Draw schematic &amp; control diagrams for hot water supply scheme in any building.</li> <li>b) Differentiate between machine automation &amp; process automation; giving reasons.</li> </ol>  | 07<br>08 |
| Q.3 | <ol style="list-style-type: none"> <li>a) Describe features of SCADA system in details.</li> <li>b) Explain different levels of automation &amp; their merits &amp; de – merits.</li> </ol>   | 07<br>08 |
| Q.4 | <ol style="list-style-type: none"> <li>a) Explain with example discrete process control.</li> <li>b) Describe batch process control system with example.</li> </ol>   | 07<br>08 |
| Q.5 | Write short notes on <u>any three</u>   | 15       |
|     | <ol style="list-style-type: none"> <li>a) Levers</li> <li>b) Hydraulic actuators</li> <li>c) RS232 &amp; RS 485</li> <li>d) Mod bus</li> </ol>  |          |

Section B

- Q.6 Solve any five 10
- a) Write advantages of SCADA.
  - b) How displays are categorized in DCS?
  - c) What are field buses in DCS?
  - d) What are functions of SCADA?
  - e) What is interface? What is its function?
  - f) What are alarm functions used in SCADA for substation automation?
- Q.7 a) What factor makes SCADA different from other control systems? Explain drawing SCADA architecture? 07
- b) Explain how 08
- i) Tangible user interface &
  - ii) Tactile interfaces are functioning?
- Q.8 a) Explain SCADA communication. What are standard communication protocols? Discuss any one. 07
- b) What is meant by distributed control system? Compare it with traditional control system. 08
- Q.9 a) Describe applications of SCADA in transmission & distribution systems; with sketches. 07
- b) Explain role of multiplexers in DCS, with neat sketches. 08
- Q.10 Write short notes on any three 15
- a) Data high way
  - b) Architecture of DCS
  - c) Graphical user interface
  - d) Trending in SCADA

Total No. of Printed Pages:2

**SUBJECT CODE NO:- H-342**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**B.E. (EEP/EE/EEE)**  
**Power System Protection**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
1. Q.no.1 and Q.no. 6 are compulsory.
  2. Solve any two question from section A & B each, excluding compulsory question.
  3. Assume suitable data if Necessary.

**Section A**

- |     |   |                |
|-----|---|----------------|
| Q.1 | Attempt any five  | 10             |
|     | <ol style="list-style-type: none"> <li>a) Classify relays based on relay timing.</li> <li>b) What are the advantages of static relay?</li> <li>c) Define operating force and restraining force.</li> <li>d) Give Difference between C.T &amp; P.T.</li> <li>e) Draw &amp; explain summation Transformer.</li> <li>f) Explain working principle of differential relay.</li> <li>g) Define current Setting &amp; Pickup level.</li> </ol> |                |
| Q.2 | <ol style="list-style-type: none"> <li>a) Describe the essential qualities of a protective relaying.</li> <li>b) Determine the time of operation of 5 amps 3 second over current relay having current setting of 125% &amp; time setting multiplier of 0.7 connected to a supply circuit through a 400/5 C.T when a circuit carries fault current of 4000amp ( consider time of operation 3.5 second)</li> </ol>                        | 07<br>08       |
| Q.3 | <ol style="list-style-type: none"> <li>a) Explain Merz Price Protection of transformer.</li> <li>b) Explain in details Percentage differential relay with its advantages.</li> </ol>  | 07<br>08       |
| Q.4 | <ol style="list-style-type: none"> <li>a) Explain Different types of faults occurred in alternator.</li> <li>b) Explain harmonic restraint relay.</li> </ol>  | 07<br>08       |
| Q.5 | Write a short note on   |                |
|     | <ol style="list-style-type: none"> <li>a) Merz Price Protection</li> <li>b) Negative Sequence relay</li> <li>c) Restricted Earth fault Protection</li> </ol>  | 05<br>05<br>05 |

Section B

Q.6	Attempt any five	10
	<ul style="list-style-type: none"> <li>a) Define Making capacity &amp; Breaking capacity of circuit Breaker.</li> <li>b) What is difference between recovery voltage &amp; arc voltage?</li> <li>c) What is arc Phenomenon?</li> <li>d) State Application &amp; Properties of SF6 circuit Breaker.</li> <li>e) Explain ELCB.</li> <li>f) State the factors on which Arc resistance is depends.</li> <li>g) Classify oil circuit breaker.</li> </ul>	
Q.7	<ul style="list-style-type: none"> <li>a) Explain in details Vacuum circuit breaker.</li> <li>b) Explain in details Bus Bar protection system.</li> </ul>	07 08
Q.8	<ul style="list-style-type: none"> <li>a) Explain in detail Microprocessor based impedance relay.</li> <li>b) Explain in details Air circuit breaker.</li> </ul>	07 08
Q.9	<ul style="list-style-type: none"> <li>a) An 11KV 500MVA circuit breaker suddenly closes on a top fault determine                             <ul style="list-style-type: none"> <li>1) Symmetrical breaking current</li> <li>2) Asymmetrical breaking current assuming 50% of D.C. Component</li> <li>3) The peak making current</li> <li>4) Short time current rating</li> </ul> </li> <li>b) Derive the expression for RRRV &amp; Maximum value RRRV.</li> </ul>	07 08
Q.10	Write a short note on <ul style="list-style-type: none"> <li>a) Auto reclosing</li> <li>b) ELCB</li> <li>c) Lightning Arrester</li> </ul>	05 05 05

Total No. of Printed Pages:3

**SUBJECT CODE NO:- H-377**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**B.E. (EEP/EE/EEE)**  
**Digital Signal Processing**  
**(REVISED)**

[Time: Three Hours]

[Max.Marks: 80]

Please check whether you have got the right question paper.

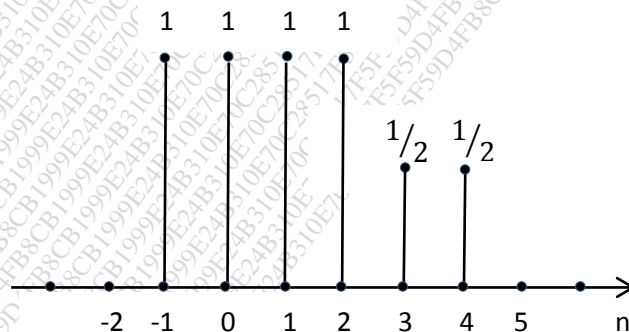
- N.B
- i. Attempt any three questions from each section
  - ii. Q.No.1 from section A and Q.No.6 from section B are compulsory.
  - iii. Assume suitable data wherever necessary.

**Section A**

- Q.1 Solve -.
- 1) What should be minimum sampling frequency of continuous time signals to avoid aliasing? 01
  - 2) Define signal, system and signal processing. 03
  - 3) State properties of discrete time sinusoids. 03
  - 4) Define. Random & deterministic signals. 03
  - 5) Define. Unit impulse response of a system and what is its significance? 03

- Q.2
- a) Compute convolution  $y(n) = x(n) * h(n)$ . of following signals. 06  
 $x(n) = \{1, 1, 0, 1, 1\}$ ,  $h(n) = \{1, -2, -3, 4\}$ .
  - b) A Discrete time system can be static or dynamic, linear or nonlinear, time invariant or time varying, causal or noncausal. Examine the following systems. w.r.t these properties- 07
    - i)  $Y(n) = \cos[x(n)]$
    - ii)  $Y(n) = x(-n + 2)$
    - iii)  $Y(n) = \sum_{k=-\infty}^{n+1} x(k)$ .
    - iv)  $Y(n) = x(n) + n \cdot x(n + 1)$ .

- Q.3 a) A discrete time signal  $x(n]$  is shown in fig. sketch and label carefully. Each of the following 06 signals.



- i.  $x(n - 2)$
- ii.  $x(4 - n)$
- iii.  $x(n + 2)$
- iv.  $x(n^2)$
- v.  $x(n)u(2 - n)$
- vi.  $x(n - 1)\delta(n - 3)$

- b) State and explain advantages of digital signal processing over analog signal processing. 07

- Q.4 a) Determine the particular solution. of the first order difference equation. 07  
 $y(n) + a_1y(n - 1) = x(n)$ .  $|a_1| < 1$  When input.  
 $x(n)$ . Is unit step sequence. i.e.  $x(n) = u(n)$ .
- b) Draw block diagram representation of – 03  
 $y(n) - 3y(n - 1) - 4y(n - 2) = x(n) + 2x(n - 1)$ . Using basic building block.
- c) Draw block diagram representation for following operation- 03  
 i) Adder  
 ii) Subtractor  
 iii) Constant multiplier  
 iv) Multiplier  
 v) Unit delay and unit advance
- Q.5 Write short note on-(any two) 14
- 1) Correlation
  - 2) Classification of discrete time systems.
  - 3) Concept of frequency in continuous and discrete time signals

**Section B**

- Q.6 Solve- 01
- 1) If ROC is an exterior part of circle. in z-plane, what type of  $x(n)$  it represents? 01
  - 2) If z-transform of  $x(n)$  is  $\{z^{-1} + z^{-2} + z^{-3} + z^{-4}\}$ . what will be the z-transform of  $x(n-1)$ . 03
  - 3) State what is the importance of twiddle factor? 03
  - 4) Differentiate between linear & circular convolution. 03
  - 5) Mr. 'x' has drawn the frequency spectrum of signal containing third & fifth harmonics in its fundamental. What will be its nature? 03
- Q.7 a) State properties of z-transform explain any three properties. 07  
 b) Determine the z-transform of the following signals. 06
- 1)  $x(n) = \{3, 0, 0, 0, 0, 6, 1, -4\}$
  - 2)  $x(n) = \begin{cases} \left(\frac{1}{2}\right)^n & n \geq 5 \\ 0 & n \leq 4 \end{cases}$
- Q.8 a) Find 8- point DFT of following sequence.  $x(n) = \{1, 2, 1, 2\}$  06  
 b) Determine IDFT of following- 07  
 $X(K) = \{1, 1 - j2, -1, 1 + j2\}$

- Q.9 a) Establish relation between DFT and z-transform.  
 b) Determine the partial fraction expansion of the proper function.

06  
07

$$X(z) = \frac{1}{1 - 1.5z^{-1} + 0.5z^{-2}}$$

Q.10 Write short note on – (any two).

14

- 1) FIR filter structures
- 2) IIR filter structures
- 3) Properties of DFT.