H-4028

Total No. of Printed Pages:02

SUBJECT CODE NO:- H- 4028
FACULTY OF SCIENCE AND TECHNOLOGY
Final B.Tech. (E.E.) (Sem-VII)
Open Elective-II
Energy Planning & Conservation
[Revised]

[Time: Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B. 1) Question No.1 from section A and question no 6 from section B are compulsory
2) Solve any two from remaining questions from each section.
3) Assume suitable data , if required

Section – A

Q.1 Solve any 5 from following 10
a) Define Energy conservation and Energy Efficiency.
b) Recall the basis for achieving the aim of energy security for a country?
c) Identify the elements of succesful energy management program.
d) List tworeponsibilities of Energy Manager.
e) Recall the term Targeted audit
f) Impact of Global variations

Q.2 a) Review method for energy pricing is done in India 07
b) Identify the need of integrated energy policy for organization. 08

Q.3 a) Outline duties of energy manager 07
b) Explain goal setting element for successful energy management program. 08

Q.4 a) What are skills and duties of energy Manager 07
b) Explain Force Field Analysis 08

Q.5 Explain in short (any three) 15
a) Recognition and motivation
b) Skills of energy manager
c) Targeted audit
d) Bench marking

Section B

Q.6 Solve any 5 from following 10
a) Maximum Energy efficiency
b) Enlist basic measurements for energy audit
c) Natural lighting
d) List down any two designated customers
e) Recall any two salient features of EC Act – 2001
f) Enlist instruments used in energy audit

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Q.7 a) Enlist and explain types of energy audits and need of the same 07
b) Reproduce salient features of energy conservation act 2001. 08

Q.8 a) Enlist utility systems used in the factory and briefly explain energy conservation opportunities in them 08
b) Energy manager has arrived following data 07
i) Ref. year energy used -------12 million kcal
ii) P.F for current year (2010) -------0.92
iii) Energy for current year -------- 11 million kcal
calculate Plant energy Performance for year 2010 & comment

Q.9 a) Explain phenomenon of Day lighting 07
b) What are mandatory provisions of energy Conservation Act 2001. 08

Q.10 Write short notes (on any three) 15
i) Bench marking
ii) ELCB
iii) Flow measuring instruments
iv) Energy conservation principle

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Total No. of Printed Pages: 02

SUBJECT CODE NO:- H-4047
FACULTY OF SCIENCE AND TECHNOLOGY
Final B.Tech. (E.E.) (Sem-VII)
Elective -III
Utilization of Electrical Energy
[Revised]

[Time: Three Hours] **[Max. Marks: 80]**

Please check whether you have got the right question paper.

N.B
1. Question no 1 from section A and question no 6 from section B is compulsory.
2. Solve any two from remaining question from each section
3. Assume suitable data, if required.

Section A

Q.1 Attempt any five of the following: 10

a) What properties are to be considered while selecting material for heating element?
b) What is the fundamental difference between electric arc welding and resistance welding?
c) Define i) Mean Spherical Candle Power (MSCP) ii) Mean Horizontal Candle Power (MHCP)
d) Why is the tungsten selected as the filament material?
e) How can the rate of dielectric heating can be raised.
f) What are the different modes of heat transfer?
g) What is the difference between plastic welding and fusion welding?

Q.2 a) Explain the principles of electric spot welding and seam welding. 08
b) Describe the construction and operation of an electric arc furnace. 07

Q.3 a) Explain resistance welding and its applications. 08
b) Explain the method of induction heating and describe coreless type of induction furnace. 07

Q.4 a) State and explain laws of Illumination. 08
b) What is dielectric heating? Explain the factors on which the dielectric loss in a dielectric material depends? 07

Q.5 a) Explain the construction and working of a filament lamp. Compare it with fluorescent lamp 08
b) A 250V lamp has a total flux of 3000 lumens and takes a current of 0.8A. Calculate i) lumens per watt and ii) MSCP per watt. 07

Section B

Q.6 Attempt any five of the following 10

a) Why magnetic circuit of traction motor is not made up of cast iron?
b) What is the main difficulty associated with series parallel control.
c) List the major types of rechargeable batteries considered for EV and HVE systems.
d) Why the traction motor must be small in overall dimensions especially in its overall diameter?

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e) What are the advantages of hybrid vehicles?
f) What is the value of voltage used in overhead supply for trains in India?
g) Why the regenerative braking is not recommended for tramways and trolley busses?

Q.7 a) Compare the use of dc series motor and ac series motor in electric traction. 08
b) Analyze why steam engine traction system is replaced by electric traction system. 07

Q.8 a) What is a linear induction motor? List merits and demerits with applications. 08
b) A dc series motor drives a load. The torque of the motor varies as the square of the speed. The motor takes a current of 15A when the speed is 640 RPM. Calculate the motor speed and current drawn when the field winding is shunted by a diverter of the same resistance as that of field winding. Neglect all motor losses and assume the magnetic circuit is unsaturated. 07

Q.9 a) Explain the construction of Li-ion battery and indicate its typical voltages levels. 08
b) What are the different systems of railway electrification? Explain which one is being commonly adopted in our country. 07

Q.10 Write short notes (any Three): 15
a) Special Requirements of train lighting.
b) Linear Induction Motor.
c) Speed control of dc series motor.
d) Battery driven vehicles and their applications.

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-4068
FACULTY OF SCIENCE AND TECHNOLOGY
Final B.Tech. (E.E.) (Sem-VII)
Elective -IV
Advanced Industrial Automation
(Revised)

[Time: Two Hours] **[Max.Marks: 40]**

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) Solve any two from remaining questions from each section.
3) Assume suitable data, if required.

Section A

Q.1 Solve any three from following 06
a) Define concept of process variable.
b) Define plant automation
c) Draw SMART Transmitter.
d) Write any two differences for convertor and transmitter.

Q.2 a) List down the elements used for Automation & explain any one. 03
b) Compare SMART transmitter with conventional transmitter. 04

Q.3 a) Explain need of standardization of signals & currents. 03
b) Draw block schematic diagram and explain. 04

Q.4 a) Explain difference between convertor and transmitter. 03
b) Draw process loop with components and explain. 04

Q.5 a) Explain with neat figure two wire transmitter. 03
b) Recall diagram and function of proximity switch. 04

Section B

Q.6 Solve any three from following 06
a) What mean by Ladder diagram.
b) Enlist applications of PLC for industry
c) What mean by interfacing.
d) Define valve gain.

Q.7 a) With neat diagram explain control valve terminology. 03
b) What mean by Programmable Logic Controller. Explain. 04

Q.8 a) Explain SCADA. 04
b) Recall control valve characteristics. 03

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Q.9	a)	Explain concept of ladder diagram with standard symbols.	03
	b)	Recall elements required for creation of data base.	04
Q.10	Answer following		
	a)	Explain SCADA architecture.	03
	b)	Explain applications of control valves.	04

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Total No. of Printed Pages:1

SUBJECT CODE NO:- H-4069
FACULTY OF SCIENCE AND TECHNOLOGY
Final B.Tech. (E.E.) (Sem-VII)
Elective –IV Industrial Safety and Health
(Revised)

[Time: Two Hours] **[Max. Marks: 40]**

Please check whether you have got the right question paper.

N.B
1) **Q.No.1** from section **A and Q.5** from section **B** are compulsory. Attempt any **two** from the remaining questions in each section.
2) Figures to the right hand side indicated full marks.

Section A

Q.1 Answer the following question. 08
a) List the various insurance policies for plant and workers.
b) What is an responsibility of safety management?
c) Why it referred to as HEINRICH TRAINGLE?
d) Define the terms occupational accident.

Q.2 What is the difference between safety and health hazard? 06

Q.3 What are the economic reasons for maintaining safety? 06

Q.4 Define terms: - Hazard, Trigger and risk. 06

Section B

Q.5 Answer the following question. 08
a) Define the terms authority and Accountability
b) What are the basic elements of OHSAS?
c) List the objectives of safety act.
d) Draw the safety network.

Q.6 Define safety auditing. Explain the procedure for implementation. 06

Q.7 State the approached to avoid accidents. 06

Q.8 What are the ILO conventions and recommendations? 06

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Total No. of Printed Pages:1

SUBJECT CODE NO:- H-4070
FACULTY OF SCIENCE AND TECHNOLOGY
Final B.Tech. (E.E.) (Sem-VII)
Elective -IV Electrical Transport System
(Revised)

[Time: TWO Hours] **[Max. Marks: 40]**

Please check whether you have got the right question paper.

N.B
1) Attempt all questions.
2) Assume suitable data, if required.

Section A

Q.1 Attempt any five of the following: 10
- i) What is the basic difference between series and parallel hybrid e-vehicle?
- ii) List the batteries used in e-vehicles.
- iii) What is PV cell?
- iv) What is mean by the term "Solar cars"?
- v) State the concept of hybrid electric drive train.
- vi) State the output equations for solar and PV cell.

Q.2 a) Explain the limitations of e-vehicles. 05

OR

b) Explain the advantages of e-vehicles. 05

Q.3 a) Explain the term "Fuel Reformer Design". 05

OR

b) Explain the architecture of parallel hybrid electric drive trains. 05

Section B

Q.4 Attempt any five of the following: 10
- i) State the principle of generator.
- ii) Write down the speed and torque equations of DC series motor.
- iii) Enlist the types of batteries.
- iv) What is solar array, Module?
- v) Define voltage regulation of AC generator.
- vi) Enlist the components used in e-vehicles.

Q.5 a) What are the advantages using dc generators in e-vehicles? 05

OR

b) Explain the term "Control System Principle" of motor control system. 05

Q.6 a) Write any eight factors that imposes limitations on use of e-vehicles. 05

OR

b) Explain the term "voltage and frequency regulations". 05

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H-494

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-494
FACULTY OF SCIENCE AND TECHNOLOGY
BE(EEP/EE/EEE) (Sem-I)
Elective-I: Neural Network and Fuzzy Logic
[OLD]

[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 remaining Section A &Section B.
3) Assume suitable data if necessary.

Section A

Q.1 Answer any FIVE. 10

a) Define supervised training.
b) What are the different types of Learning rules?
c) Define artificial neural network. (ANN)
d) List out different types of training.
e) Define feedback networks.
f) What are the four main steps in back propagation algorithm?

Q.2 a) Distinguish between supervised & unsupervised learning. 08
b) Explain briefly the back propagation algorithm. 07

Q.3 a) Discuss the step by step procedure of back propagation learning algorithm in detail. 07
b) Classify & explain different types of learning. 08

Q.4 Explain multi-layer feed forward model of ANN & describe the function & structure of each unit. 15

Q.5 Write the algorithm of generalized delta rule [Back propagation algorithm]. 15

Section B

Q.6 Answer any FIVE. 10

a) What are fuzzy relations?
b) Write De Morgan's Law.
c) Define Classical Set.
d) List the properties of Crisp Sets.
e) Differentiate fuzzification & defuzzification.
f) List the defuzzification methods.

Q.7 a) A linguistic variable X which measures the academic excellence is taken from universe of 08

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discourse U={1 2 3 4 5 6 7 8 9 10 }. The membership functions are defined as follows

$$\mu(Excellent) = \{(8,0.2)(9,0.6)(10,1)\},$$

$$\mu(good) = \{(6,0.1)(7,0.5)(8,0.9)(9,1)(10,1)\}$$

Construct the membership function of Good but not excellent.

b) Explain the types of different membership functions. 07

Q.8 a) A=[0.6,0.3,0.9,1,1] and B=[0.8,0.4,0.9,0.7,1] 07
Perform Union, Intersection, Complement and Demorgan's operation on these fuzzy sets.

b) Explain the terms. 08
1. Fuzziness
2. Power Set
3. Union of two sets
4. Complement of two sets.

Q.9 With a neat sketch discuss the major components of fuzzy controller. 15

Q.10 Write short notes on 15

a) Lambda- cut
b) Knowledge base
c) Rule Base

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-500
FACULTY OF SCINECE AND TECHNOLOGY
B.E. (EEP/EE)
Microcontrollers & Applications
[OLD]

[Time: Three Hours] **[Max.Marks:100]**

Please check whether you have got the right question paper.

N.B 1. Attempt three questions from each section.

Section -A

Q.1 a) List out significance of general propose registers of 8086 microprocessor. 08
b) Explain significance of each bit of 8086 flag register. 08

Q.2 a) Explain all addressing modes supported by 8086 microprocessor with examples. 08
b) Explain function of following instructions. 08
i. LEA Bx, [SI] ii. NEG Bx.
iii. MUL BL iv. CMP AL, BL

Q.3 a) Explain maximum mode configuration of 8086 microprocessor. 08
b) Write 8086 AMP to compute average of three eight bit numbers. 08

Q.4 a) Draw the interfacing diagram of 8086 with 8255. Write ALP to transfer data AB, BC, CD on port A, port B, & port C respectively. Address of port A is 40H. 08
b) What is multiprocessing system? Draw an interfacing diagram of 8086 & 8087. Explain how 8087 executes instructions. 08

Q.5 Write note on 18
a) Minimum mode configuration
b) Comparison between PROCEDURE & MACRO
c) Interfacing of stepper motor to 8086 microprocessor.

Section – B

Q.6 Draw a neat architecture of 8051 microcontroller & explain its different sections in brief. 16

Q.7 a) Explain internal memory organization of 8051 microcontroller. 08
b) Write 8051μc ALP to add the content of two external RAM memory location 7400H& 7401H & store the result at 7402H. 08

Q.8 a) Explain the functions of following instructions. 08
i. CPLA ii. MUL AB
iii. XCHA, 22H iv. MOV 23, 24H

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b) Explain SCON & PCON Control registers of 8051 microcontroller. 08

Q.9 a) Draw a neat interfacing diagram to interface stepper motor to 8051μC& write an ALP For its rotation in clockwise direction. 08

b) Discuss significance of SFRs in 8051μc. 08

Q.10 Write notes on 18

a) Selection of microcontroller
b) Application of microcontroller
c) Comparison of microprocessor& microcontroller

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-619
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-I) (CGPA)
Electrical Drives

[Time: Three Hours] **[Max. Marks: 80]**

Please check whether you have got the right question paper.

N.B
1) Q. 1 from Section A and Q.6 from Section B are compulsory.
2) Attempt any two questions from Q.2 to Q.5 and Q.7 to Q.10.
3) Assume suitable data wherever necessary.

Section A

Q.1 Solve **any Five** Questions from the following: 10
a) What are the advantages of Electrical Drives as compare to other drive system?
b) Define the load equalization of drive using fly wheel.
c) Closed loop control drive.
d) Choice of proper electrical drive
e) What is the function of power modulator?
f) Compare AC and DC drive.

Q.2 a) State the essential parts of electric drive with block diagram and mention their functions. 07
b) What are the advantages of closed loop control of drives, explain current limit control with block diagram. 08

Q.3 a) How does a phase locked loop speed control scheme operate? Where do you use it? 07
b) A weight of 500 kg is being lofted up at a uniform speed of 1.5 m/sec by a winch driven by motor running at a speed of 1000 rpm. The moments of inertia of the motor and winch are 0.5 and 0.3 kg m^2 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 1000 rpm. 08

Q.4 a) What is the principle of regenerative braking? How DC chopper is used for this purpose? 07
b) 220v, 875 rpm, 150A separately excited dc motor has an armature resistance of .04ohm, it is fed from a single phase fully controlled converter with an ac source voltage of 230v, 50Hz. Assuming continuous conduction. 08
Calculate:
1. Firing angle for 1.2 times the rated motor torque and 700rpm
2. Motor speed for firing angle = 150° at rated torque

Q.5 Write short notes on the following: 15
1. Dynamic braking of DC drive
2. Different components of load torque
3. Chopper fed DC drive

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Section B

Q.6 Solve **any Five** questions from the following: 10

a) What is slip power recovery scheme?
b) Give some applications of load commutated inverter fed synchronous motor.
c) Mention the special feature of BLDC motor.
d) Mention two modes employed in variable frequency control of synchronous motor drive.
e) Give some applications of synchronous motor drive.
f) What is v/f control?

Q.7 a) Explain using a power circuit how the speed of induction motor drive can be controlled by using voltage source inverter. 07

b) A star connected SCIM has following rating and parameter: 08
400V,50Hz,4pole,1300rpm,Rs=2ohm,Rr'=2 ohm, Xs=Xr'= 4 ohm
Motor is controlled by VSI at constant (V/F) ratio. Inverter has frequency variation from 10 to 50 Hz. Calculate approximate values of
i) Speed for a frequency of 20 Hz and 90% of full load torque
ii) Frequency for speed of 1000rpm and full load torque

Q.8 a) Describe the operation of self controlled synchronous motor drive. 07

b) Explain the operation of current source fed Induction motor drive. 08

Q.9 a) Explain in detail the true synchronous mode and self control mode of variable frequency control of synchronous motor. 07

b) A three phase, 5 Kw, 440 V, 50 Hz, 4 pole Y connected synchronous motor has stator winding resistance of 0.2 ohm, synchronous reactance of 8 ohm and a rated field current of 1 A. When operating at full load the p.f. is unity. 08
Calculate:
a) Torque angle when operating at full load
b) Pull out torque and power.

Q.10 Write short notes on the following: 15

a) Industrial applications of Induction motor Drive
b) BLDC motor Drive
c) PWM control of Induction motor drive

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-627
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-I)
Power System Protection
[CGPA]

[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 questions from section A & B each excluding compulsory questions.
3) Assume suitable data if Necessary.

Section-A

Q.1 Attempt any five: 10
a) Define current setting & Time setting.
b) Differentiate between C.T & P.T
c) Define reach of the Distance relay.
d) Write the characteristics of electromagnetic relay.
e) Draw and explain summation transformer.
f) What are the types of protection scheme?
g) List out the different faults occurs in transformer.

Q.2 a) Explain construction & working of differential protection of Alternator. 07
b) What is static relay? What are the advantages and disadvantages of static of relay over electromagnetic relay? 08

Q.3 a) Explain desirable qualities of protective relaying. 07
b) Draw a neat sketch of induction disc relay and discuss its operating principle. 08

Q.4 a) Explain the connection of CT secondary for differential protection of Y/Δ connected power transformer. 08
b) Draw and Explain Buchholz relay. 07

Q.5 Write short note on: 15
a) Negative sequence relay.
b) Restricted earth fault protection.
c) Frame leakage protection of transformer.

Section-B

Q.6 Attempt any five: 10
a) What is RRRV?
b) Explain ELCB
c) Define Arc. Write down the cause of arc formation.
d) Give the classification of circuit Breaker.
e) Explain current chopping phenomenon.

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f) Give the advantages of vacuum circuit Breaker
g) What is surge absorber?

Q.7 a) Explain construction and working principle of ABCB (Air Blast circuit Breaker) with advantages & disadvantages. 08
b) Explain the various methods of over voltage protection of overhead transmission line. 07

Q.8 a) What are the different standard ratings of circuit Breaker? Also write the Application. 07
b) Explain behaviour of Busbar differential scheme for internal and External faults. 08

Q.9 a) Explain Microprocessor Based over current relays. 07
b) Explain resistance switching concept used in CB action. Write the Expression for critical value of resistance for zero transient oscillations. 08

Q.10 Write short note on:: 15
a) Rod Gap lightning arrester.
b) Protection against travelling wave.
c) Carrier current protection.

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Total No. of Printed Pages: 02

SUBJECT CODE NO:- H-634
FACULTY OF SCIENCE AND TECHNOLOGY
B.E.(EEP/EE/EEE) (Sem-I)
Digital Signal Processing
[CGPA]

[Time: Three Hours] **[Max. Marks: 80]**

Please check whether you have got the right question paper.

N.B
1. Q. 1 from section A and Q. 6 from section B are compulsory.
2. Attempt any two questions from Q. 2 to Q.5 and Q. 7 to Q. 10

Section A

Q.1 Solve any five from following:- 10

a) Write any four properties of Z- transform
b) Define Random signal and deterministic signal.
c) What should be the ROC of causal signal?
d) Enlist four advantages of digital signal processing?
e) According to Nyquist criteria what should be the minimum value of sampling frequency?
f) What do you meant by aliasing of signal?

Q.2 a) Explain digital signal processing with neat block diagram and write the applications of Digital signal processing. 08

b) Determine which of the following signals are periodic and compute their fundamental period 07

i)	Cos (0.01 πn)	ii)	$x(n) = e^{j6\pi n}$
iii)	$x(n) = \cos(2\pi/3)$	iv)	$x(n) = \sin(3n)$

Q.3 a) Compute the convolution of $y(n) = x(n) * h(n)$ 07

$x(n) = \{1, 2, 3, 4, 5, 6\}$ and $h(n) = \{0, 0, 1, 1, 1, 1\}$

b) A discrete time signal is given by, $x(n) = \{1, 2, 3, 4, 5, 6, 7\}$. perform following 08

Operations on the given signal and represent graphically.

i) X(n-3) ii) x(2-n) iii) x(n+4) iv) x(3n)

Q.4 a) Determine the z-transform and find ROC of the following signal: 07

$x(n) = [4(2)^n - 3(3)^n]u(n)$

b) Determine the pole-zero plot for the following system describe the difference equation: 08

$$y(n) - \frac{3}{4}y(n-1) + \frac{1}{8}y(n-2) = x(n) - x(n-1)$$

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Q.5 Write short note on (any three) 15

a) Causal and Non-causal system
b) Parallel connection of LTI systems
c) Concept of frequency in Continuous time and discrete time signals.
d) Properties of Z-transform

Section B

Q.6 Solve any five from following 10

a) Write the importance of Twiddle factor?
b) What do you meant by circular convolution?
c) Define FIR and IIR systems.
d) If ROC of the signal is exterior part of the circle then which type of the signal it represents?
e) Define pole and zero.
f) Define zero padding.

Q.7 a) State and explain any two properties of Discrete Fourier transform. 07

b) Compute the circular convolution of the following two sequences: 08
$x_1(n) = \{3, 1, 1, 12\}\ and\ x_2(n) = \{3, 4, 2, 1\}$

Q.8 a) Compute 4 point DFT of : $x(n) = \{1, 0, 0, 1\}$ 07

b) Compute IDFT of: $y\ (k) = \{1, 1 - 2j, -1, 1 + 2j\}$ 08

Q.9 a) Explain Lattice structure of FIR system. 07

b) Draw and explain Direct Form- II structure of IIR filter system. 08

Q.10 Write short note on: 15

a) Signal Flow Graph
b) Comparison between FIR and IIR system
c) Properties of DFT

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Total No. of Printed Pages: 02

SUBJECT CODE NO:- H-641
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-I)
Industrial Automation
[CGPA]

[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** from are compulsory.
2. Solve any two questions from remaining questions in section A & B.
3. Figures to the right indicate full marks.
4. Assume suitable data, if necessary.

Section A

Q.1 Solve any FIVE 10

a) What are the capabilities of PLC? Also enlist advantages of PLC.
b) What is the role of controller in automation?
c) List out the reasons for Automation.
d) Draw ladder diagram for logic gates using two inputs and one output.
e) Draw block diagram of traditional control system.
f) List various types of communication protocol used in automation.
g) What is the selection criterion for the input-output devices connected to PLC?

Q.2
a) Draw and explain hierarchy of automation. 08
b) Classify levels of automation as manually operated, semi-automatic and fully automatic. 07

Q.3
a) Develop ladder logic for: i) When a start switch is made ON motor A gets ON immediately after 5 second motor B gets ON and makes A OFF.
ii) When motor B gets ON after 5 second motor C gets ON & makes motor A & B OFF.
Iii) Motor C remains ON till the time input switch is kept ON. 08

b) Draw & Explain Block diagram of PLC. 07

Q.4
a) How DOL starter with protection is provided to AC motor using PLC? 08
b) Explain different types of counters used in PLC. 07

Q.5 Write short notes on 15

a) Batch process
b) Components of an automation system
c) Combinational logic control verses sequential control.

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Section B

Q.6 Solve any FIVE 10

a) What are the functions of SCADA?
b) What are the alarm functions arranged through SCADA system in substation control?
c) What is DCS? What are its advantages?
d) List the applications of DCS.
e) How displays are categorized in DCS?
f) List communication techniques used in SCADA system.
g) How DCS is different from tradition control system.

Q.7
a) Draw and explain SCADA system architecture. 08
b) Explain power system application using SCADA. 07

Q.8
a) Explain RTU and MTU. 08
b) How analog and discrete control is obtained is obtained using Remote Terminal Unit (RTU) 07

Q.9
a) Draw and explain input-output hardware system in DCS. 08
b) Differentiate between DCS and traditional control system. 07

Q.10 Write short notes on 15

a) Alarm function in SCADA
b) SCADA functionality
c) Components of SCADA.

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-659
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-I)
Elective-I Flexible AC Transmission System
[CGPA]

[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 questions from each section from the remaining questions.
3) Assume suitable data, wherever necessary.

Section A

Q.1 Solve any five questions. 10

i) What are the different types of storages?
ii) What are conventional methods used for compensation in power system?
iii) Define term VAR compensator
iv) What is the best location of SVC?
v) What is TCR?
vi) What types of harmonic present in the O/P of 1Ø bridge converters?
vii) How is reactive power controlled in electrical network?
viii) What are different power electronics switching devices?

Q.2 a) What are different methods to control flow of power in parallel path in electrical power system? 08

b) What are possible benefits from facts technology? 07

Q.3 a) Explain the working of single phase full wave bridge converter. 08
b) Explain the construction and working of FC-TCR. 07

Q.4 a) Explain the functional control scheme for TSC-TCR. 08
b) Explain the mid-point voltage regulation for line segmentation for series compensators. 07

Q.5 a) Explain the merits and demerits of hybrid compensators. 08
b) Compare SVC and STAT COM 07

Section B

Q.6 Solve any five. 10

i) How is system voltage stability limit is improved?
ii) What is UPFC?
iii) What do you mean by load compensation?
iv) Define active and passive VAR control
v) What is use of Braking Resistor?

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vi) What are factors affecting the application of series compensation?
vii) List the factors affecting performance SVC.
viii) Define voltage stability.

Q.7	a)	Explain with neat sketch and waveforms the TCSC type series controller.	08
	b)	Explain GCSC with neat diagram and waveform.	07
Q.8	a)	Explain the basic operation of IPFC & its principle.	08
	b)	Explain the working of static synchronous series compensator (SSSC)	07
Q.9	a)	Explain the working of Hybrid phase angle regulator.	08
	b)	Explain how to damp power oscillation in voltage and phase angle regulator.	07
Q.10	a)	Explain use of TCBR for power oscillation damping.	08
	b)	Explain UPFC back to back voltage source converter.	07

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-660
FACULTY OF SCIENCE AND TECHNOLOGY
B.E.(EEP/EE/EEE) (Sem-I)
Elective-I Power Electronics - II
[CGPA]

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1) Q.1 from section A and Q.6 from section B are compulsory.
2) Attempt any two questions from Q.2 to Q.5 and Q.7 to Q.10
3) Assume suitable data wherever necessary.

Section A

Q.1 Solve any Five Questions from the following. 10
a. Compare the SCR and GTO properties
b. Draw the V-I characteristics of GTO
c. Draw the circuit diagram of single phase half controlled rectifier
d. Sinusoidal PWM technique
e. Importance of extinction angle
f. Power factor improvement

Q.2 a. Explain the power factor improvement by extinction angle control. 07
b. Explain the working of three phase PWM rectifier 08

Q.3 a. Explain the switching characteristics of SCR. 07
b. Describe the operation of three phase controller rectifier. 08

Q.4 a. Explain the operation of twelve pulse converter. 07
b. Describe the operation of voltage control of three phase Inverter. 08

Q.5 Write short notes on the following: 15
a. V-I characteristics of MOSFET
b. Symmetric angle control
c. Voltage control of three phase inverter

Section B

Q.6 Write short note on any five questions from the following. 10
a. Cascaded multilevel inverter
b. Diode clamped multi level inverter
c. Advanced modulation techniques
d. Concept of resonant converter.
e. DC power supply
f. Application of multi level inverter

Q.7 a. Explain the working of flying capacitor MLI. 07
b. Give the comparative analysis of multilevel Inverter. 08

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Q.8	a.	Explain the function of ZVS resonant converter.	07
	b.	Describe the operation of class E resonant converter.	08
Q.9	a.	Explain the construction and working of fly back converter.	07
	b.	Explain the construction and working of push pull converter.	08
Q.10		Write short note notes on the following:	15
	a.	Voltage control of resonant inverter.	
	b.	Forward converter applications	
	c.	Comparison of MLI	

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-661
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-I)
Elective-I Electrical Traction and Utilization
[CGPA]

[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 6 from section B are compulsory.
2) Attempt any two questions from Q.2 to Q.5 and Q.7 to Q.10.
3) Assume suitable data wherever necessary.

Section A

Q.1 Solve any five questions from the following. 10
a) Write down any four difference between Third Rail System & OHE.
b) Enlist the types of Choice of Traction system.
c) Draw the neat labeled Pentograph Current Collctor diagram.
d) Draw the Block diagram of AC Locomotive?
e) Write down the drawbacks of tramways.
f) What do you mean by self-relieving property in traction motor?
g) Why DC motor is used widely for traction system.
h) How Linear Induction is related with Traction System.

Q.2 a) Explain Diesel Engine Driven 3-phase synchronous generator feeding 3-phase Induction Motor through Diode Bridge & inverter. 07

b) Write a short note on Flywheel Drive and Battery Drive system. 08

Q.3 a) Explain Major Traction substation equipment. 07
b) Write a short note on signaling interference in telecommunication lines. 08

Q.4 a) Explain Characteristics of Traction motor in detail. 07
b) Distinguish between Suitability of DC Series motor and DC shunt motor for traction duty. 08

Q.5 Write a short note on 15

i. D.C. Electrification system
ii. Current Collectors in traction system
iii. Repulsion Motor

Section B

Q.6 Solve any five questions from the following. 10
a) What is the use of interlock?
b) Draw speed time curve for Train movement and Braking?

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c) What do you mean by Crest speed and Scheduled speed?
d) What do you mean by Dead man's handle?
e) Which braking is used in traction system and why?
f) Draw the neat labeled diagram of Vapour Compression Refrigeration cycle.
g) Write down the function of Evaporator and Condenser.
h) Give the methods of traction motor control.

Q.7 a) Write a short note on Use of Metadyne in traction system. 07
b) Explain Series parallel Controllers used in Traction system with circuit diagram. 08

Q.8 a) Explain Speed time Curve movement and braking in detail. 07

b) Factors Affecting Specific Energy Consumption of an Electric Train Operating on a Given Schedule Speed. 08

Q.9 a) Explain Vapour Compression Refrigeration cycle with neat labeled diagram. 07
b) Explain Central Air Conditioning system. 08

Q.10 Write a short note on, 15
i. Multiple Control Unit
ii. Magnetic Track Brakes
iii. Water Coolers

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-662
FACULTY OF SCINECE AND TECHNOLOGY
B.E.(EEP/EE/EEE) (Sem-I)
Elective-I Artificial Intelligence
[CGPA]

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1) Q.1 from section A and Q.6 from section B are compulsory.
2) Attempt any two questions from Q.2 to Q.5 and Q.7 to Q.10.
3) Assume suitable data wherever necessary.

Section -A

Q.1 Solve any five questions from the following. 10

a) Write a truth table for the following propositional logic statement $(A \wedge B) \vee (\neg A \wedge \neg B) \rightarrow (A \wedge B)$
b) Give two definition of AI.
c) What are the advantages and disadvantages of a TMS?
d) What is the interpretation of PROPEL in conceptual dependency?
e) What is non- monotonic reasoning?
f) What are the types of frames?
g) Define Scripts.
h) What is the interpretation of PTRANS in conceptual dependency?

Q.2
a) Detail the A* and AO* algorithm using a suitable example. 07
b) What are the different AI techniques? Explain in details. 08

Q.3
a) How are frames and semantic nets being implemented in artificial intelligence? 07
b) Explain the concept of forward chaining and backward chaining using a valid example. 08

Q.4
a) Explain the TMS system being implemented in AI using logical example and a block diagram. 07
b) What is conceptual dependency? Explain atleast 6 conceptual dependency definitions with meanings. 08

Q.5
a) Using the depth first search technique solve the water jug problem. 07
b) What is Logic programming? Explain the propositional and predicate logic with suitable example. 08

Section B

Q.6 Solve any five questions from the following 10

a) Define Goal Stack Planning.
b) What is the role of command ‘UNSTACK” in a block world problem?
c) What is the meaning of NLU?
d) What is the role of command “PUT DOWN” in a block world problem?

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e) List the different types of learning in problem solving.
f) What is Pragmatic Processing?
g) What is NLP?
h) Define Matching.

Q.7	a)	Assuming an initial and final state of a block solve the block problem using Goal Stack planning?	07
	b)	What is a block world problem? Explain the concept using the rules applied to the problem.	08
Q.8	a)	What are the major steps in Natural Language Processing? What are the two major components associated with NLP.	07
	b)	What are the various components associated with planning of a system? Explain at least four components in detail.	08
Q.9	a)	How is the concept of game playing implemented in Artificial intelligence? Explain game tree using a suitable example.	07
	b)	Describe the Alpha cut off pruning search procedure using a game tree.	08
Q.10	a)	What do you mean by rote learning? Explain with suitable example.	07
	b)	What is an expert system? Explain the knowledge acquisition in expert system.	08

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-663
FACULTY OF SCIENCE AND TECHNOLOGY
B.E.(EEP/EE/EEE) (Sem-I)
Elective-I Industrial Management
[CGPA]

[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

a) Define Management & roles
b) What is Network concept & Techniques
c) Principles of HRM
d) Principles of Material Management
e) What is wealth Maximization?
f) What is profit Maximization?
g) What is mission/ vision of any organization.

Q.2
a) What is transformation in Manuf. system & how product is value added? 07
b) Discuss Management is Art or Science. Why Managers are required in Organization. 08

Q.3
a) What is project management & how Network analysis techniques argument it smoothly and timely. 07
b) What is need for plant layout and how it acts as a catalyst in better production concept & material handling? 08

Q.4
a) Explain Principles of Good H.R. Policy & procedure of recruitment. 08
b) What are purchases and its principles with objectives to reduce cost of product /services? 07

Q.5
a) What is marketing management? How Market research helps in good Marketing & Customer feedback. 07
b) What is Decision making and elaborate management steps to arrive 08

Section B

Q.6 Attempt any five from following. 10

1) Write Law of demand & supply.
2) Write Indian factory act.
3) TQM
4) List out Quality obstacle
5) Inventory
6) What is economics

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Q.7	a)	Explain different buying techniques & Write criteria's while buying	07
	b)	Write down elements of MIS (Management Information System) & 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)	Compare ISO9001 WITH ISO14001	07
Q.10	a)	How to overcome transportation problem by operation research.	08
	b)	Explain ISO registration benefits and its certification enhances branding.	07

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1193
FACULTY OF SCIENCE AND TECHNOLOGY
Final B.Tech. (Electrical) (Sem VII)
Switchgear and Protection
[OLD]

[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 is compulsory.
ii) Solve any two from remaining questions fromeach section.
iii) Assume suitable data, if required.

Section "A"

Q.1 Attempt any five of the following: 10
a) Define term Rate of Rise of restriking voltage (RRRV).
b) What are the functions of protective relays?
c) Mention any two applications of differential relay.
d) What is medium employed for extinction of arc in air circuit breaker?
e) In a air blast circuit breakers, the pressure of the air is of the order ……..kg/cm^2.
f) What are the essential qualities of the protective relaying?

Q.2 a) What is resistance switching? Derive an expression for critical resistance in terms of system inductance and capacitance which gives no transient oscillations. 08
b) Write classifications of circuit breakers based on medium used for arc extinction. 07

Q.3 a) Explain interruption of small inductive current (current chopping) with relevant diagram. 07
b) Explain high and low resistance principles of an arc interruption in case of circuit breakers. 08

Q.4 a) What are the advantages of an air blast circuit breaker over the oil circuit breaker. 07
b) For a 132 KV system, the reactance and capacitance up to the location of the circuit breaker is 3Ωand $0.015\mu F$, respectively. Calculate 08
1) The frequency of transient oscillation
2) The maximum value of restriking voltage across the contacts of the circuit breaker
3) The maximum value of RRRV.

Q.5 Write short note. (any three) 15
a) Auto reclosing
b) Arc interruption theories
c) Essential qualities of protective relays
d) Air break circuit breaker

Section B

Q.6 Solve any five from following. 10
a) What are the main types of stator winding faults?
b) Which relay operates during the removal of one phase of the induction motor?

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c) The detection of unbalance in currents in large induction motor is done by ------ sequence current.
d) Why neutral resistor is added between neutral and earth of an alternator.
e) Which harmonic is most dominant in magnetizing inrush current?
f) What do you understand by field suppression of an alternator?

Q.7 a) Explain the problems arise in the application of differential protection of a transformer and how they are overcome? 07
b) What is frame leakage protection? Discuss its working principle and field of application. 08

Q.8 a) Explain single phasing in induction motors and how motor is protected from single phasing. 07
b) An induction motor with following data is protected against over load and short circuit. 08
1) Rated output: 1000HP 2) Power Factor: 0.85 3) Rated Voltage:6600V 4) Efficiency : 90% 5) continuous overload: 110% of the rated current 6) Starting Current : 5 times the rated current 7) Pickup Setting: 100% of 1A.
Suggest suitable CT ratio and calculate overload and instantaneous relay settings.

Q.9 a) Explain the phenomenon of over fluxing in a transformer and protection against it. 07
b) A three phase, 11KV/132KV, Delta-star connected power transformer is protected by differential protection. The CTs on LV side have current ratio 500/5. What must be the current ratio of the CTs on HV side and how should they be connected? 08

Q.10 Write short notes. (any three) 15
a) Mho Relay
b) Protection against single phasing in induction motor
c) Frame leakage protection indoor and outdoor installations
d) Air break circuit breaker

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-1226
FACULTY OF SCIENCE AND TECHNOLOGY
Final B.Tech. (Electrical) (Sem-VII)
Advanced Control System
Old

[Time: Three Hours] **[Max.Marks: 80]**

Please check whether you have got the right question paper.

N.B
i. Question no 1 from section A and Question no 6 from section B is compulsory.
ii. Solve any two from remaining questions from each section.
iii. Assume suitable data, if required

Section A

Q.1 Answer any five of the following: 10
a) Define Eigen values and Eigen vector.
b) Write the properties of state transition matrix.
c) What is meant by diagonalization?
d) Define controllability and observability.
e) What is need of state compensator?
f) What is state observer?
g) Write the state model of n^{th} order system?

Q.2 A) Find the State Transition Matrix $\emptyset(t)$ for a system whose state matrix is given 08
$A = \begin{bmatrix} -5 & -1 \\ 3 & -1 \end{bmatrix}$ using Laplace Transform method.

B) Explain various methods to determine State Transition Matrix (STM). 07

Q.3 A) For a given matrix 08

$$A = \begin{bmatrix} 0 & 2 & 0 \\ 4 & 0 & 1 \\ -48 & -34 & -9 \end{bmatrix}$$

Determine: a) Characteristic Equation b) Eigen value c) Eigen Vector

B) What are the necessary and sufficient conditions for arbitrary pole placement? 07

Q.4 A) Comment on controllability and observability for following state model 08

$$A = \begin{bmatrix} -2 & 1 \\ 1 & -2 \end{bmatrix} \quad B = \begin{bmatrix} 1 \\ 0 \end{bmatrix} \quad C = [1 \quad -1]$$

B) What are effect of pole zero cancellation on the controllability and observability of the system? 07

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Q.5 Write short note on 15

a) Transfer function of lead compensator network
b) Tachometer feedback compensation.
c) Diagonalization of system.

Section B

Q.6 Answer any five of the following: 10

a) What are the merits and demerits of sampled data control systems?
b) What are the methods available for the stability analysis of sampled data control systems?
c) Write any two Properties of nonlinear systems?
d) What are linear and nonlinear systems? Give examples.
e) Write Z-transform of Delayed unit impulse function.
f) Explain limit cycle.
g) State Sampling theorem.

Q.7 A) With the help of diagram explain the phenomenon of jump resonance. 08

B) Explain phase plane method. 07

Q.8 A) Define stability of a digital control system and discuss how Jury-stability criterion is applied for stability investigation for such systems. 08

B) Draw and explain block diagram of digital control system. 07

Q.9 A) Describe procedure for obtaining Pulse-transfer function 08

B) Explain procedure of Isocline method for construction of phase trajectory. 07

Q.10 Write short notes on 15

a) Describing function methods.
b) Zero order hold (ZOH)
c) Digital PID controller

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Total No. of Printed Pages:3

SUBJECT CODE NO:- H-1261
FACULTY OF SCIENCE AND TECHNOLOGY
Final B.Tech. (Electrical) (Sem-VII)
Power System Operation and Control
[Old]

[Time: Three Hours] **[Max.Marks: 80]**

Please check whether you have got the right question paper.

N.B 1) Question no.1 from section A and Question no. 6 from section B is compulsory.
2) Solve any two from remaining questions from each section.
3) Assume suitable data, if required.

SECTION – A

Q.1 Attempt any five from the following: 10

a) Write a power – angle equation for cylindrical rotor alternator.
b) Classify & define power system stability.
c) What are the different methods for reactive power compensation?
d) Define the series type FACTs controller.
e) What is sub – synchronous resonance?
f) A turbo alternator of 100 MVA, the inertia constant (H) is 5. What is the value of inertia constant for an alternator of 50 MVA?
g) At an industrial sub – station with a 4 MW load at 0.8 lag p.f. A shunt capacitor bank is proposed to improve load p.f. to 0.97 lag. Calculate the rating of shunt capacitor bank.

Q.2 a) Derive the swing equation which governs the dynamics of synchronous machine. 08
b) Discuss the methods to improve steady state and transient stability. 07

Q.3 a) What is the necessity of reactive power compensation? Explain the various sources of reactive power control. 08
b) State the equal area criterion (EAC) for stability and explain the effect of sudden change in mechanical input on transient stability with the help of EAC. 07

Q.4 a) Explain the principle of operation of SVC with neat circuit diagram. 08
b) Explain the effect of change in excitation on synchronous machine. 07

Q.5 a) A 50 Hz, 4 pole turbo generator rated 100 MVA, 11 KV has an inertia constant of 8.0 MJ/MVA. Find i) the kinetic energy stored in the rotor at synchronous speed. ii) Find rotor acceleration, if the mechanical input is suddenly raised to 80 MW for an electrical load of 50 MW. (neglect mechanical and electrical losses). 08 07
b) An induction motor operating at power factor of 0.8 lagging consumes 300 kw. A shunt capacitor bank is proposed to improve the power factor of induction motor to 0.92 lagging. Calculate the KVAr rating of required capacitor bank.

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SECTION – B

Q.6 Attempt any five from the following: 10

a) Illustrate incremental water rate characteristics for hydro power plant.
b) State any four constraints on operation in economic load dispatch problem.
c) What is unit commitment? State the methods for unit commitment.
d) What is penalty factor in economic load dispatch?
e) What is mean by control area in AGC?
f) State the importance of economic dispatch.
g) What is power system reliability?

Q.7 a) Draw and explain the input – output, incremental heat rate and incremental fuel cost characteristics of thermal power plant. 08

Consider the three thermal power plants whose details are given as follows, The incremental fuel (or heat) rate:

$$F1 = (0.003^{*}P1 + 7)^{*}10^{3}\ k - cal/MW - hr;$$
$$F2 = (0.002^{*}P2 + 7)^{*}10^{3}\ k - cal/MW\ - hr;$$
$$F3 = (0.004^{*}P3 + 8)^{*}10^{3}\ k - cal/MW\ - hr$$

b) Constraints on power generation in MW: 07

$$50 \le P1 \le 500; \qquad 40 \le P2 \le 400; \qquad 20 \le P3 \le 200$$

Fuel cost at each plant are:
CP1=1.1 Rs/k-cal; CP2=1.05 Rs/k-cal; CP3=1.2 Rs/k-cal
Using priority list method, prepare the unit commitment table for load demand of 400 MW, 900 MW and 1100 MW.

Q.8 a) Explain the single area load-frequency control with neat transfer function block diagram. 08
b) Explain the various methods for thermal power plant scheduling. 07

Q.9 a) Explain with mathematical formulation, the LaGrange multiplier method of economic load dispatch without transmission loss and no constraints of generation limit while meeting load. 08

b) 150 MW, 220 MW and 220 MW are the ratings of three units located in thermal power station. their respective incremental fuel costs are given by the following equations: 07

$$\frac{dC_1}{dP_1} = 0.11P_1 + 12\ Rs\ /\ MW\ - hr;$$
$$\frac{dC_2}{dP_2} = 0.095P_2 + 14\ Rs\ /\ MW\ - hr;$$
$$\frac{dC_3}{dP_3} = 0.1P_3 + 13\ Rs\ /\ MW\ - hr$$

Determine the economical load allocation between the three units, when the total load on station is
i) 300 MW &
ii) 500 MW

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Q.10 Write short note on 15

a) Energy banking
b) Capacity interchange
c) Diversity interchange

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1296
FACULTY OF SCIENCE AND TECHNOLOGY
Final B.Tech. (Electrical) (Sem-VII)
High Voltage Engineering
[Old]

[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. 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) What is Tesla coil?
b) State electrical properties of liquid dielectrics.
c) State intrinsic breakdown.
d) Draw circuit diagram of simple voltage doubter.
e) What is treeing and tracking?
f) State specific values of impulse voltage as per Indian standard.
g) List out various methods for estimation of electric field stresses.
h) Define dielectric strength of insulator.

Q.2 A) What is finite element method"? Give the outline of this method for solving the field problems. 08
B) Explain procedure to control electric field intensity in HV equipment. 07

Q.3 A) Explain ionization by collision, photoionization and secondary ionization process in gases. 08
B) Explain various theories of breakdown mechanism of commercial liquid dielectrics. 07

Q.4 A) Explain with neat sketches, Cocksoff Walton voltage multipliers circuit, explain clearly its operation when circuit is 1) Loaded 2) Unloaded. 08
B) Describe the construction, principle of operation and application of multistage Marx's surge generator. 07

Q.5 Write short notes on: 15
a) Townsend criterion for breakdown in gases.
b) Electrostatic generator.
c) Phenomenon of Treeing & Tracking.
d) Tripping and control of impulse generator.
e) 'Van de Graaff' generator.

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SECTION – B

Q.6 Solve any 5: 10

a) Define creepage distance.
b) What is practical significance of impulse test?
c) What is loss tangent?
d) Draw schematic of generating voltmeter (rotating vane type).
e) State different forms of high voltages.
f) What is Rogowski coil?
g) What is loss factor?
h) Define insulation co – ordination.

Q.7 A) Explain different theories of formation of clouds. 07

B) Discuss any one method of measurement of impulse voltage. 08

Q.8 A) What are principles of insulation Co – ordination on "H.V. & HV system"? 08

B) What are the requirement of sphere gap for measurement of high voltage? Write the disadvantages of sphere gap for measurements. 07

Q.9 A) State and explain dielectric constant with loss component. 08

B) Explain various testing methods of insulators and bushings. 07

Q.10 Write short notes: any three 15

a) Natural cause of over voltage.
b) Partial discharge.
c) Testing of surge arresters..
d) Radio interference measurement.
e) CRO measurements.

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-1342
FACULTY OF SCIENCE AND TECHNOLOGY
Final B.Tech. (Electrical) (Sem-VII)
EL-II Utilization of Electrical Energy
[OLD]

[Time: Three Hours] **[Max. Marks: 80]**

Please check whether you have got the right question paper.

N.B 1) Question no 1 from Section A and Question no 6 from Section B is compulsory.
2) Solve any two from remaining questions from each Section.
3) Assume suitable data, if required.

Section A

Q.1 Attempt any five of the following:- 10

a) Draw the starting characteristics of drives.
b) State advantages of electric welding.
c) What are the advantages of electric braking over mechanical braking?
d) What properties are considered for selecting material for heating element?
e) Why a series motor is preferred for the electric traction?
f) Explain control methods for electric heating.
g) What is the difference between plastic welding and fusion welding?

Q.2 a) Explain the performance curves for DC series motor. 08
b) Explain principle and operation of induction heating. 07

Q.3 a) Derive the equation for shunt motor with armature shunted. 08
b) What are the causes of failure in heating elements? 07

Q.4 a) Give the explanations on industrial applications of electrical drive. 08
b) What is dielectric heating? Explains the factors on which the dielectric loss in a dielectric material depends? 07

Q.5 a) Explain in brief how heating is done in the following cases: 08
1) Resistance heating 2) Induction heating 3) Dielectric heating

b) Explain resistance welding and its applications. 07

Section B

Q.6 Attempt any five of the following: 10

a) Define: i) Luminous intensity ii) Luminous Flux
b) Explain significance of the term coefficient of adhesion.
c) Why the magnetic circuit of a traction motor is not made of cast iron?
d) Compare between Fluorescent tube and filament lamp.
e) What are the advantages of hybrid vehicles?

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f) A 220 V lamp has a total flux of 1660 lumens and takes a current of 0.44A. Calculate:
1) Lumens per watt and 2) M.S.C.P per watt

g) What is the relation between candela and lumens per steradian?

Q.7 a) Explain the various types of lighting schemes with relevant diagrams. 08

b) Explain the merits of dc series motor that make it more suitable drive for electric traction than other drives. 07

Q.8 a) Explain the following terms w.r.t illumination Engineering: 08
1) Reduction factor 2) Utilization factor
3) Maintenance factor 4) Absorption factor

b) Explain load sharing with respect to traction motors. 07

Q.9 a) Explain boost converter. 08

b) Compare between D.C. and A.C. systems of railway electrification from the point of view of main line and suburban line railway service. 07

Q.10 a) Explain polar curves of illumination. 08

b) Explain the following terms w.r.t. illumination Engineering. 07
1) Candle Power 2) Brightness or luminance 3) Illumination
4) Luminous intensity

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-4007
FACULTY OF SCIENCE AND TECHNOLOGY
Final B.Tech. (EE) (Sem-VII)
Switchgear and Protection
(Revised)

[Time: Three Hours] **[Max.Marks: 80]**

Please check whether you have got the right question paper.

N.B
1) Q.1 from section A and Q.6 from section B are compulsory.
2) Solve any two remaining questions from each section.
3) Assume suitable data, if required.

Section A

Q.1 Attempt any five of the following: 10
a) What are different zones of protection?
b) What is current setting in induction relay?
c) Enlist the advantages of vaccum circuit breaker.
d) What is autoreclosing?
e) Why the induction cup relay is superior to induction disc relay?
f) What do you mean by primary and back up protection of power system?

Q.2 a) Explain the process of ionization in circuit breaker. 07
b) Explain the time graded and current graded principle of relay. 08

Q.3 a) Explain arc interruption theories. 07
b) Explain the construction and working of SF6 circuit breaker with neat sketch. 08

Q.4 a) Draw and explain the basic trip circuit breaker. 07

b) A 50 Hz 13.8 KV three phase generator with grounded neutral has an inductance of 15/mH/Phase and is connected to bus bar through a CB. The capacitance to earth between the generator and the CB is 0.05μF/Phase Calculate 08
1) Maximum restriking voltage
2) Time for maximum restriking voltage.
3) Average RRRV up to the first peak.

Q.5 Write short notes (Any three) 15
a) Symmetrical breaking capacity
b) VCB
c) RRRV
d) Interruption of capacitive current

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Section B

Q.6 Attempt any five of the following: 10

a) Enlist different faults occurs in transformer.
b) What will happen if the field of alternator fails?
c) Why neutral resistor is added between neutral and earth of an alternator?
d) What is restricted earth fault protection?
e) What are the causes of harmonics?
f) What do you mean by internal and external fault?

Q.7 a) Explain with neat sketch differential earth fault protection. 07

b) Explain the phenomenon of over fluxing in a transformer and protection against it 08

Q.8 a) What are the various abnormal operating conditions to which a modern turbo alternator is likely to be subjected? 07

b) Explain the phenomenon of loss of prime mover and its protection. 08

Q.9 a) Show the different types of feeders and the protective schemes employed for the protection of feeders. 08

b) What is frame leakage protection? Discuss its working principle and field of application. 07

Q.10 Write short notes (Any three) 15

a) Magnetizing inrush current
b) Over speeding protection of alternator
c) Characteristics of SF6 gas
d) Air blast circuit breaker

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-4014
FACULTY OF SCIENCE AND TECHNOLOGY
Final B.Tech. (E.E.) (Sem-VII)
Advanced Control System
Revised

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1) Question no 1 from section A and Question no 6 from section B is compulsory.
2) Solve any two from remaining questions from each section.
3) Assume suitable data, if required.

SECTION "A"

Q.1 Attempt any five of the following : 10
a) Draw the pole zero plot for Lead compensator.
b) What are the effects of lead compensation?
c) Define state variable
d) Write down state model of linear system.
e) Define state transition matrix.
f) Define ZIR and ZSR
g) Define controllability and observability of a system.

Q.2 a) What is lead compensator? Derive its transfer function. 08
b) Design a lag compensator for the given system with specifications. 07

$$G(s) = \frac{0.025}{S(1+0.5s)(1+0.05s)}$$

Velocity error constant = 20 sec^{-1} and phase Margin = 40^0

Q.3 a) Derive transfer function from state model. 08
b) Find the state transition matrix using Laplace inverse method. 07

$$\begin{bmatrix}\dot{x}_1\\ \dot{x}_2\end{bmatrix} = \begin{bmatrix}-2 & 3\\ 0 & -3\end{bmatrix} X(t)$$

Q.4 a) Define terms Eigen values, Eigen vector, modal matrix and Vander Monde Matrix. 08
b) For a given system. 07

$\dot{X}(t)\begin{bmatrix}0 & 1\\ -2 & 0\end{bmatrix} X(t)$ where $X(0) = \begin{bmatrix}1\\ 1\end{bmatrix}$

and $Y(t) = [1 \; -1]\, X(t)$

obtain complete Time response of given system

Q.5 a) Define controllability and observability. Explain any one method to determine it. 08
b) For the following system determine controllability and observability. 07

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$$\begin{bmatrix}\dot{X}_1\\ \dot{X}_2\end{bmatrix} = \begin{bmatrix}-1 & 0\\ 0 & -2\end{bmatrix}\begin{bmatrix}X1\\ X2\end{bmatrix} + \begin{bmatrix}0\\ 1\end{bmatrix} + u(t)$$

$$Y(t) = [1 \quad 2]\begin{bmatrix}X1\\ X2\end{bmatrix}$$

SECTION "B"

Q.6 Attempt any five of the following: 10

a) Define Jump resonance.
b) Define Limit cycle.
c) Define Describing function methods of non-linear system.
d) What is nyquist rate in sampling theorem
e) Write zero-order hold transfer function (ZOH).
f) Define pulse transfer function
g) State Shannon's Sampling theorem.

Q.7
a) Derive describing function of ideal relay. 08
b) Explain various nonlinearities present in the systems. 07

Q.8
a) List importance properties of Z transform 04
b) What are the advantages and limitations of Digital Control Systems? 04
c) Explain different types of phase portraits in phase plane method. 07

Q.9
a) What is zero-order hold? Derive it its transfer function. 08
b) Solve the following difference equation by use of z-transform method. 07
$x(k+2) + 6x(k+1) + 5x(k) = 0, x(0) = 0, x(1) = 1$

Q.10 Attempt any three of the following: 15

a) Derive Pulse-transfer function of closed loop system.
b) Explain direct realization of Direct Programming in digital controller.
c) Draw the block diagram of digital control system & explain the function of each block in short.
d) Explain the common types of non-linearties observed in physical systems.
e) Evaluate the inverse z-transform of the:

$$X(z) = \frac{10z}{(z-1)(z-0.2)}$$

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-4021
FACULTY OF SCIENCE AND TECHNOLOGY
Final B.Tech. (E.E.) (Sem-VII)
Power System Operation and Control.
[Revised]

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1) Question no 1 from section A and Question no 6 from section B is compulsory.
2) Solve any two from remaining questions from each section.
3) Assume suitable data, if required.

SECTION A

Q.1 Attempt any five from the following: 10

(a) Define transient and dynamic stability.
(b) What are the factors that affect the transient stability?
(c) What are the different methods for reactive power compensation?
(d) Classify basic types of FACTs controller.
(e) What is sub-synchronous resonance?
(f) An infinite bus of 1 pu. is fed from synchronous machine having E=1.1 pu. If the transfer reactance between them is 0.5 p.u. then that will be the steady state power limit?
(g) 500 MW, 21 kv, 50 Hz, 3-phase, 2-pole synchronous generator having a rated power factor 0.9, has a moment of inertia 27.5×10^3 kg – m^2. Calculate the inertia constant (H).

Q.2 (a) Derive the equation for critical clearing angle for a power system consisting of a single machine supplying to an infinite bus bar, for a 3 phase short circuit occurred close to the generator bus. 08

(b) Discuss the factors that limit the loading capability of transmission line. 07

Q.3 (a) State the equal area criterion (EAC) for stability and explain the effect of sudden change in mechanical input on transient stability with the help of EAC. 08

(b) What are the types of converters basically used in FACTS devices & what are the differences between them? 07

Q.4 (a) Explain the principle of operation of SVC with neat circuit diagram. 08

(b) Explain the working principle of TSC-TCR and plot V-I characteristics. 07

Q.5 (a) Using equal area criteria, find critical clearing angle for a generator operating at 50 Hz and delivers 1.00 p.u. to an infinite bus through a transmission circuit. A fault takes place reducing max. power to 0.5 p.u. whereas, before the fault it was 1.69 p.u. And after clearing of fault, it is 1.2 p.u. 08

(b) An induction motor operating at power of 0.8 lagging consumes 300 kW. A shunt capacitor bank is proposed to improve the power factor of induction motor to 0.92 lagging. Calculate the KVAr rating of required capacitor bank. 07

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SECTION B

Q.6 Attempt any five from the following: 10

(a) Draw an incremental heat rate and incremental fuel cost curve for a thermal power plant.
(b) State the fuel constraints in unit commitment problem.
(c) What is mean by spinning reserve?
(d) What is penalty factor is economic load dispatch?
(e) What are functions of energy control centre?
(f) What is Area Control Error?
(g) Elaborate the term SAIFI and CAIDI.

Q.7 (a) State the various methods of unit commitment and explain priority method with suitable example. 08

Consider the three thermal power plants whose details are given as follows,

Unit 1-Max-600 MW, C1=5610+79.2 $P_1 + 0.01562\ P_1^2$ Rs./hr.

(b) Unit 2-Max-400 MW, C2=3100+78.5 $P_2 + 0.0194P_2^2$ Rs./hr. 07

Unit 3-Max-200 MW, C3=936+7=95.64$P_3 + 0.005784P_3^2$ Rs./hr.

Using priority list method, prepare the unit commitment table.

Q.8 (a) With schematic diagram, explain the working of turbine speed governing system. 08

(b) Define the unit commitment and economic load dispatch. Explain the necessity of this task. 07

Q.9 (a) Explain the automatic voltage regulation (AVR) scheme for synchronous generator with neat block diagram. 08

(b) 150 MW, 220 MW and 220 MW are the ratings of three units located in thermal power station. Their respective incremental fuel costs are given by the following equations: 07

$$\frac{dC_1}{dP_1} = 0.11P_1 + 12Rs/MW - hr; \quad \frac{dC_2}{dP_2} = 0.095P_2 + 14Rs/\ MW - hr;$$

$$\frac{dC_3}{dP_3} = 0.1P_3 + 13Rs\ /\ MW - hr$$

Determine the economical load allocation between the three units, when the total load on the station is i) 300 MW & ii) 500 MW

Q.9 Write short notes on 15

(a) Power pool
(b) Diversity interchange
(c) Inadvertent power exchange

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-116
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-II)
High Voltage Engineering
[REV]

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1. Q.no.1 &Q.no.6 are compulsory.
2. Attempt any two questions from remaining questions of each section.
3. Assume suitable data whenever necessary.

Section A

Q.1 Solve any five questions. 10
1) Define electric field intensity
2) Why there is need to control electric stress in voltage equipment?
3) Define Di- electric.
4) Write "Paschen's Voltage".
5) Define the meaning of "Breakdown".
6) What is the need of generating impulse current?
7) What is the time duration of "surface voltage".
8) What is treeing & tracking.

Q.2 a) Explain the procedure to control electric field intensity in HV equipment. 07
b) What is "Boundary elements method?" Explain how it differs from charge simulation method. 08

Q.3 a) Explain various theories of breakdown mechanism of commercial liquid dielectrics. 07
b) Explain ionization by collision, photoionization and secondary ionization process in gases. 08

Q.4 a) Describe the construction, principle of operation & application of multistage marx's surge generator. 07
b) Explain the experimental set-up for the measurement of pre-breakdown current in a gas. 08

Q.5 Write a short on
1) Surge voltage & it's distribution & control 05
2) Paschens law 05
3) Electrostatic generator. 05

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Section – B

Q.6 Solve any five questions 10

1) State different forms of high voltages
2) Define Basic Impulse Level (BIL)
3) What do you mean by "Natural causes"?
4) What is Rogowski coil?
5) Define creepage distance
6) State meaning of radio interference
7) Write the factors influence the spark over voltage sphere gaps
8) What is loss factor?

Q.7 a) Explain various aspects of insulation design and insulation co-ordination adopted for EHV system. 07

b) Explain the different theories of charge formation in clouds. 08

Q.8 a) Explain the methods of measurements of high impulse current. 07

b) What is the significance of "Faraday cage"? Explain in details with sketches. 08

Q.9 a) Why is cockroft – Walton circuit preferred for voltage multiplier circuits? Explain it's working with a schematic diagram. 07

b) Explain the necessity of double frequency –double voltage measurement. 08

Q.10 Write a short on

1) Testing of cable 05
2) CRO measurement 05
3) Surge arrestor testing 05

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-150
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-II)
Power System Operation & Control
[Revised]

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B i) Question no.1 and Question no.6 are compulsory.
ii) Attempt any two questions from remaining four questions from each section.
iii) Assume suitable data if necessary.
iv) Figures to the right indicate full marks.

Section A

Q.1 Solve any five questions. 10
a. Draw the mmf waveform of a single coil in armature windings.
b. What is amortissuer circuit in synchronous machine?
c. What is static excitation system?
d. Draw waveform of spatial mmf wave in air gap.
e. Define small signal stability.
f. What is the function of governor in power system?
g. Define rotor angle stability.
h. Draw the stator leakage flux patterns.

Q.2 a. Explain the elements of excitation system with the help of functional block diagram. 08
b. Explain classical transfer function of hydraulic turbine with its special characteristics & electrical analogue circuit. 07

Q.3 a. Derive the expression for swing equation of synchronous machine. 08
b. Derive the transfer functions for steam turbines. 07

Q.4 a. Explain the classical model of single machine infinite bus system. 08
b. Explain control and protective functions in excilation system. 07

Q.5 a. Explain Generic speed governing system model for normal speed. 08
b. Explain mathematical description of a synchronous machine. 07

Section B

Q.6 Solve any five questions. 10
a. What is contingency analysis?
b. What is incremental cost?
c. What is synchronous Condenser?
d. Write application of voltage regulators.
e. Write types of SVC.
f. What is optimum scheduling of hydrothermal system?

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g. Write the dynamic constraints.
h. What are secondary constraints?

Q.7	a.	Explain any four methods of voltage control in detail.	08
	b.	Explain production and absorption of reactive power in power system equipment's.	07
Q.8	a.	Explain induction voltage regulator.	08
	b.	What is feeder regulation?	07
Q.9	a.	Explain power system security assessment in detail.	08
	b.	What are the hazards of under frequency operation?	07
Q.10	a.	What is SCADA? Explain the role of SCADA system in energy management system.	08
	b.	Write short note on maintenance scheduling.	07

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-251
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-II)
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) Answers to the sections must be written in same answer book.
ii) Question no.01 & Question no.06 are compulsory.
iii) Attempt any two questions from remaining questions of each section.

Section A

Q.1 **Solve any five questions** 10

a) Define the terms lumen & lux.
b) Give the difference between joint box system & looping in system.
c) What is the difference between voltmeter & PT, ammeter & C.T.?
d) Give the symbols used for circuit elements.
e) Enlist the different types of lighting arrangements.
f) Define earthing & what are the types of it?
g) What are the needs of electrical symbols as per ISI?

Q.2 a) Explain the working principle of alarm circuit without relays. 08
b) Explain the difference between schematic diagram & circuit diagram. Explain with an example. 07

Q.3 a) Write short note on protective devices present in electrical system. 07
b) Explain with diagram plate earthing. 08

Q.4 (a) For one lamp controlled by two switches & two fans controlled by one switch & two regulators Draw 07
i) Schematic diagram
ii) Wiring diagram
iii) Single line diagram

(b) An office of size 40m x 20m is to be illuminated by 40 watt fluorescent lamps of lumen output 2700 lumen. The average illumination required at the work place is 200 lux. Calculate the number of lamps required to be fitted in the office. 08

Q.5 **Write a short note on** 15

a) Laws of illumination
b) Testing of electrical installations
c) Plate earthing

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Section B

Q.6 **Answer any five questions** 10

a) List out different types of substations
b) Define PFC & APFC.
c) State the application of overload relay
d) Draw a diagram indicating earthing pits arrangements for distribution substation.
e) Define NO & NC contacts.
f) How to decide fuse rating.
g) Why Induction motor has a high starting torque?

Q.7 (a) Describe in brief design consideration of electrical installation in commercial building. 07

(b) Explain the general requirement of electrical installation in small industries. 08

Q.8 (a) State the reasons for establishing substations mention the names of various types of Substations. 07

(b) In a village residential load of 10 KW agricultural load of 25 HP & Water works of 15 HP has to be electrified. Select the types of Substations to be erected make a list metered required for the installations of proposed substation. 08

Q.9 (a) State & explain inching circuit for 3ϕ I.M. with any one application of it. 07

(b) List out the starting methods of 3ϕ squirrel cage induction motor and explain any one method in detail. 08

Q.10 **Write a short note on any three** 15

a) Ferruling & Connector boards
b) Multispeed squirrel cage induction motor
c) Bus-bar & Busbar chamber
d) Limit Switch & Float Switch
e) Indoor Substation.

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-187
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-II)
Renewable Energy
[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 Q.No.2,3,4,5 and Q. No.7,8,9 and 10.
3. Assume suitable data if necessary.

SECTION – A

Q.1 **Solve any FIVE:** 10

a) Explain construction of solar cell.
b) Write the name of fuel used in nuclear reactor.
c) What is OTEC explain?
d) What is solar pond?
e) Define a fuel cell.
f) What are wind forms?

Q.2 a) With the neat diagram explain how wind energy can be converted into electrical energy. 08
b) Explain the merits and limitations of wind energy. 07

Q.3 a) What are the essential features for site selection of wind form? 07
b) Explain the concept of active and passive heating of buildings. 08

Q.4 a) Explain the construction of working of wind-mill with neat diagram. 08
b) Describe the vertical-axis wind machines. 07

Q.5 a) What is Thermionic converter? Explain in detail. 08
b) Explain the concept of geothermal energy. 07

SECTION – B

Q.6 **Answer any FIVE:** 10

a) What is Biomass?
b) Explain aerobic digester
c) What is Biogas?
d) How energy can be converted through Nuclear fusion?
e) What is photosynthesis?
f) What are the application of biogas?

Q.7 a) Write the different types of practical fuel cells and their applications. 08
b) What is MHD generator? Explain its working principle. 07

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Q.8	a)	Explain in brief about wave energy conversion devices.	08
	b)	Explain the OTEC open cycle.	07
Q.9	a)	What is polarization? List the different types of polarizations what occurs in fuel cells?	08
	b)	Draw neat diagram of Biogas plant and explain it.	07
Q.10	a)	What are the applications and problems of Gasifiers?	08
	b)	Explain advanced type of Biogas plant with its advantages.	07

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-248
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EE) (Sem-II)
Elective-II SAP Production Planning - II
[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. Answer any two from remaining in each section.

Section A

Q.1	a)	Explain in detail the discrete Manufacturing.	05
	b)	Compare the repetitive manufacturing with the process manufacturing.	05
Q.2	a)	Explain the configuration basics needed to set up the master data.	08
	b)	Define and explain BOM usages.	07
Q.3	a)	List & explain different predefined item categories in BOM.	08
	b)	Create the production order for discrete manufacturing.	07
Q.4	a)	Explain the master data in process manufacturing.	08
	b)	Describe the material quantity calculation in process manufacturing.	07
Q.5	Write a short note on		
	a)	Repetitive Manufacturing profile.	08
	b)	Elements of Replenishmentstrategies.	07

Section B

Q.6	a)	Discuss the flexible planning.	05
	b)	Explain the SOP planning methods.	05
Q.7	a)	Describe the changing and displaying of an event.	08
	b)	Explain the Manual model selection.	07
Q.8	a)	Discuss the special procurement types.	08
	b)	Explain the withdrawal from alternative plant.	07

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Q.9	a)	Explain the procedure to check the capacity loads.	08
	b)	Explain the features of dispatching capacity Requirements.	07
Q.10	Write a short note on		
	a)	Major element of CRP	08
	b)	Engineering change Hierarchy	07

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-249
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-II)
Elective-II: Electrical Power Quality
[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 each section.
3. Assume suitable data if necessary.

Section A

Q.1 Solve any five 10
a) Define power quality.
b) How can power quality problems be detected.
c) What is power conditioning and why it is needed.
d) What are the causes of sags and swell.
e) Define voltages flicker.
f) What are the main objective of power quality standards.
g) Name any two IEEE standards that define power quality.

Q.2 a) What is the need to evaluate the power quality? Explain the procedure to evaluate the power quality. 08

b) What do you understand by power quality and why both the utilities and consumers are concerned about it. 07

Q.3 a) What do you understand by long duration voltage variations? Explain the principle of regulating the voltage. 07

b) Explain the fundamental principles of protection against the voltage sag. 08

Q.4 a) What are the different sources of transients overvoltages? Explain the magnification of capacitor switching transients. 08

b) What are the general causes of harmonics in power system. 07

Q.5 Write short note on following (any three) 15
a) Effects of voltage sag on operation of electrical equipment's.
b) Mitigation of transients
c) Power quality standards
d) TDD (Total Demand distortion)

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Section – B

Q.6 Solve any five 10

a) What is harmonic index? State it significance.
b) Mention the harmonic sources from industrial loads.
c) What is the importance of power quality monitoring.
d) Mention the factors that should be considered for selecting the instruments.
e) Define grounding.
f) Mention the reliability indices.

Q.7 a) Explain briefly about fundamentals of harmonies generation and wave form distortion. 07

b) List the various effects of equipment's due to harmonics. Explain briefly 08

Q.8 a) Bring out the significance of power quality monitoring what are the important power quality monitoring objectives. 07

08

b) What are the various instruments used for power quality measurements. Explain the modern power quality monitors .

Q.9 a) Explain with neat diagram the proper grounding of electrical system. 07

b) Explain in detail degradation of reliability due to poor power quality 08

Q.10 Write short note (any three) 15

a) Assessment of power quality measurement data
b) Total demand distortion (TDD)
c) Inter harmonics.
d) Impact of poor power quality on reliability

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-250
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-II)
Elective-II: Electric Traction & Utilization
[Revised]

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1. Qno.1 and Q.6 are compulsory.
2. Solve any two questions from remaining questions from each sections A and B.

Section A

Q.1 Solve any five. 10
a) What is the major drawback of electric traction.
b) What is meant by speed time curve.
c) What is the function of flywheel drive.
d) Draw the characteristics of traction motors.
e) Disadvantages of electric traction system.
f) What are the different component of traction substation.

Q.2 a) Deduce the expression for sag calculation for a trolley wire. 07

b) Explain current collectors in details. 08

Q.3 a) Describe in detail trolley bus system of electric traction. 07

b) Explain AC electric Locomotive with block diagram. 08

Q.4 a) Compare the following systems of track electrification. 07
a) DC system b) AC system

b) Explain construction details of DC-traction system. 08

Q.5 Write short note on following 15
a) Traction substation equipment's
b) Signaling Interference in telecommunication circuits
c) Electric traction used in India

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Section – B

Q.6 Solve any five 10

a) Draw the symbol of SCR and give its function.
b) Draw the regenerative breaking diagram of DC shunt motor.
c) What is practical unit of refrigeration.
d) What is the main difficulty associated with series parallel control.
e) What are the different types of Air- conditioning system.
f) Draw the speed time curve of train movement and braking.

Q.7 a) Explain Room Air conditioner system in detail. 07

b) Explain use of Metadyne and megavolt in traction control. 08

Q.8 a) Explain Master controllers. 07

b) Assume a trapezoidal speed time curve and derive an expression for the maximum speed. 08

Q.9 a) Explain refrigeration system. 07

b) With help of circuit diagram explain the working of water cooler. 08

Q.10 Write short note on following 15

a) Tractive effort calculations
b) Magnetic track barkers
c) Methods of traction motor control.

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-252
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-II)
Elective-II Illumination Engineering
[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 questions from Q. No.2 to Q. No.5.
3. Attempt any two questions from Q. No.7 to Q. No.10.
4. Assume suitable data if necessary.

Section A

Q.1 Attempt any five. 10
a. Explain Snell's Law.
b. Define Dispersion
c. State any two advantages of good illumination scheme.
d. What is difference between illumination and light?
e. State any two advantages of CFL Lamps.
f. List four light source.
g. What is Luminous intensity? and its unit.
h. What is photometer?

Q.2 a. Enlist various effects of bad lighting. Explain methods of controlling natural light. 07
b. Define and explain illumination and Luminous intensity. 08

Q.3 a. Explain production of light and physics of generation of light. 07
b. Explain Dependence of human activities on light. 08

Q.4 a. With a suitable diagram explain construction and working of Laser. 07
b. With a suitable diagram explain construction and working of CFL. 08

Q.5 a. Explain design consideration of electromagnetic ballast for HID Lamps. 07
b. Explain Dimming. 08

Section B

Q.6 Attempt any five 10
a. State Lambert's cosine Law.
b. List some lighting fixture types.
c. What are primary colors?
d. What is meant by cold lighting?
e. Define coefficient of utilization.
f. What are various glare indices?
g. Define Life Cycle coasting.
h. Why a dimmer used.

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Q.7	a.	What are the types of lighting fixtures according to installation type?	07
	b.	What is polar curve? Describe its types. Hot it is helpful for an illumination engineer.	08
Q.8	a.	What are problems of point by point method?	07
	b.	With suitable diagram explain beam lumen method.	08
Q.9	a.	What is energy efficient lighting? Give its advantages. Which are the difficulties related with energy efficient lighting.	07
	b.	Explain photo voltaic lighting with suitable diagram.	08
Q.10	Write Short Notes (any three)		15
	a.	Optical Fiber Cable	
	b.	Cold Lighting	
	c.	Flood Lighting	
	d.	Switching Control Of Lighting	

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-289
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-II)
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. Answer any Two questions from remaining section A and section B.
3. Assume suitable data if necessary.

Section A

Q.1 Answer any FIVE: 10
a) Define state and state equation for a system.
b) List out advantages of Digital control system.
c) Compare Analog and Digital control system.
d) Write the properties of state transition matrix.
e) What is meant by diagonalization?
f) What is pole placement by state feedback?

Q.2 a) Find the state transition matrix $\phi(t)$ for a system whose state matrix is given 15
$A = \begin{bmatrix} -2 & -1 \\ 2 & -1 \end{bmatrix}$ Using
1) Cayley Hamilton method.
2) Laplace transform method.

Q.3 a) What is the effect of pole placement by state back? 08

b) Obtain Eigen value, Eigen vector and Model matrix for the matrix $A = \begin{bmatrix} 4 & 0 & 0 \\ -2 & 1 & 0 \\ 5 & 3 & 4 \end{bmatrix}$ 07

Q.4 a) What are the necessary and sufficient conditions for arbitrary pole placement? 07
b) Describe Krasovski method and variable gradient methods of constructing lyapunov function. 08

Q.5 Write short note on: 15
a) Power series method.
b) Digital control system.
c) Bilinear transformation.

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Section B

Q.6 Answer any five: 10

a) What are linear and nonlinear systems? Give examples.
b) What are the methods available for the analysis of nonlinear system?
c) What is limit cycle?
d) What is phase plane?
e) What is fuzzy relation?
f) What are the basic building blocks of artificial neural network?

Q.7 a) Explain saturation and backlash non linearity with necessary diagram. 07

b) Explain lyapunov's direct method. 08

Q.8 a) For a fuzzy set : $\mu_A = \{0.6, 0.3, 0.9, 1, 1\}$ and $\mu_B = \{0.8, 0.4, 0.9, 0.7, 1\}$ 08
Perform following operations on these fuzzy sets.
1) Union 2) Intersection 3) complement 4) Demorgan's operation

b) Explain fuzzy logic controller. 07

Q.9 a) List out the differences between artificial network and Biological network. 08

b) Using perceptron learning rule updates the weights for $w_1 = \begin{bmatrix} 0 \\ 1 \\ 0 \end{bmatrix}$ and the input vectors 07
as below $X_1 = \begin{bmatrix} 2 \\ 1 \\ -1 \end{bmatrix}. X_2 = \begin{bmatrix} 0 \\ -1 \\ -1 \end{bmatrix}$ use $c = 1,\ d_1 = -1$ and $f(net) = sgn(net)$

Q10 Write short notes on: 15

a) Jump Resonance.
b) Biological Neuron model.
c) Different types of membership functions.

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-307
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-I)
Electrical Drives
[OLD]

[Time: Three Hours] **[Max. Marks: 80]**

Please check whether you have got the right question paper.

N.B
i. Q.1and Q.6 are compulsory.
ii. Solve any two questions from remaining in each section.
iii. Assume suitable data if necessary.

Section A

Q.1 Solve **any five** 10

a) State the factors that can influence the choice of electric drives.
b) State the disadvantages of electric drives.
c) Draw the block diagram of electric drive.
d) What are the advantages of closed loop system.
e) What is DC chopper
f) What is regenerative braking of DC motor drive.

Q.2
a) Derive the expression to find equivalent load torque and equivalent inertia of loads in translation and rotational motion 08
b) A drive has the following parameter $T = 150 - 0.1\ N, N - M$, where N is the speed in rpm. Load torque $T_1 = 100N.m$ 07
Initially the drive is operating in steady state. The characteristics of the load torque are changed to $T_1 = -100\ N - m$,
Calculate initial and final equilibrium speeds.

Q.3
a) What are active and passive loads? Draw the speed torque characteristics for constant power load applications. 07
b) Explain the operation of chopper for forward motoring control of separately excited dc motor with aid of diagrams, waveforms and speed torque curves. 08

Q.4
a) Describe the appropriate voltage and current waveforms of the working of single phase full converter fed dc drives. 07
b) A 220 V, 1000 rpm, 60 A separately excited dc motor has an armature resistance of 0.1Ω . It is fed from a single phase full converter with an ac source voltage of 230 V, 50 Hz, assuming continuous conduction. Calculate. 08
i) Firing angle for rated motor torque and 600 rpm.
ii) Motor speed for firing angle = 125^0 and half rated torque.

Q.5 Write short notes on following 15

a) Load equalization
b) Regenerative braking of dc drives.
c) Phase locked loop control

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Section B

Q.6 Solve **any five** 10

a) Draw the speed torque characteristics of induction motor.
b) Why the stator voltage control of induction motor is suitable for low power rating and narrow speed range.
c) What are the drawbacks of rotor resistance speed control.
d) Why V/F ratio is kept constant in ac motors.
e) What is meant by Slip Power
f) What is meant by Self Controlled Mode of synchronous motor.

Q.7
a) Describe static rotor resistance control method for the speed control of 3 phase induction motor. 07
b) 3 Kw, 400 V, 50 Hz, 4 pole, 1370 rpm, delta connected squirrel cage induction motor has the following parameters referred to stator $R_s = 2\Omega$, $X_s = X_r^1 = 5\Omega$, $R_r^1 = 5\Omega$, $X_m = 90\Omega$, motor speed is controlled by stator voltage control. When driving form load if runs at rated speed at rated voltage. Calculate motor terminal voltage, current and torque at 1200 rpm. 08

Q.8
a) Describe the static Scherbius drive for the speed control of three phase slip ring Induction motor. 07
b) Explain in detail true synchronous mode and self control mode for variable frequency control of synchronous motor. 08

Q.9
a) Explain the operation of brushless dc motor drive with its advantages and applications. 07
b) A 10 MW, 3 phase, 11 KV, star connected, 6 pole, 50 Hz, 0.92 P.F.(Leading) synchronous motor has $X_s = 8.5\Omega$ and $R_s = 0\Omega$. 08
Rated field current is 52A. Machine is controlled by variable frequency control at constant V/f ratio up the base speed and constant voltage above base speed. Determine torque and field current for the rated armature current, 750 rpm speed and 0.82 leading power factor.

Q.10 Write short notes on following 15

a) CSI fed induction motor drive
b) Industrial application of AC drives.
c) PWM controlled induction motor drive.

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H-342

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-342
FACULTY OF SCIENCE AND TECHNOLOGY
BE(EEP/EE/EEE) (Sem-I)
Power System Protection
[OLD]

[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 questions from each section excluding compulsory questions.
3) Assume suitable data if necessary.

Section A

Q.1 Attempt **any five** questions:- 10

a) State the various methods used to provide backup protection.
b) Explain the following terms related to protective relaying.
1) Pick up 2) Time delay 3) Holding relay 4) Trip circuit
c) Define C.T burden.
d) What is application of reverse power relay?
e) Write classification of protective schemes.
f) State the advantages of basic impedance relay.
g) What are the various types of faults which can occur in a generator?

Q.2 a) Describe any one type of electromagnetic attracted armature relay. 08
b) Explain the working principle of directional power relay. 07

Q.3 a) What is distance relay? Explain the different types with relevant diagram. 08
b) Derive the universal torque equation. 07

Q.4 a) Write note on Earth fault protection for delta side and star side of delta star transformer. 08
b) Write down protection for prime mover failure over voltage rotor fault. 07

Q.5 Write short note on:-
05
a) Write short note on static relay 05
b) Negative Sequence relay 05
c) Write effect of fault on alternator.

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Section B

Q.6 Attempt **any five.** 10

a) Define a circuit breaker. Describe its operation in brief.
b) What is difference between recovery voltage and arc voltage.
c) State classification of circuit breaker based on different factors.
d) Why SF_6 gas is preferred in circuit breakers?
e) Explain ELCB.
f) State the factors on which Arc resistance is depends.
g) Give the advantage of minimum oil CB.

Q.7 a) Write a short note on minimum oil CB. 08
b) Explain the working of airblast CB with relevance to 07
i) Axial blast ii) Cross blast

Q.8 a) Explain in details microprocessor based impedance relay. 08
b) With a neat block diagram. Explain the operating principle of Peterson Coil. 07

Q.9 a) Derive the expression for RRRV and maximum value of RRRV. 08
b) Calculate the RRRV of 132 KV circuit breaker with neutral earthed. S.C. data as follows: 07
Broken current is symmetrical, restriking voltage has frequency 20Hz, p.f. 0.15. Assume fault is also Earthed.

Q.10 Write a short note on:-

a) Protection of substation against direct stroke 05
b) MCB 05
c) Surge Absorber 05

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-377
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-I)
Digital Signal Processing
[Old]

[Time: Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B.: i) Q.No.1 is compulsory. Solve any two questions from remaining question of Section A.
ii) Solve any three questions from Section B.
iii) Assume suitable data if necessary.

SECTION– A

Q.1 Attempt any five questions: 14

a) Enlist the applications of DSP.
b) Explain concept of aliasing.
c) Define causal & non causal system.
d) Define periodic and aperiodic signal.
e) What is signal & signal processing.
f) Define ROC in z-transform.
g) Define LTI system.

Q.2 a) A discrete time signal $x(n)$ is defined as, 07

$$x(\mathrm{n}) = \begin{cases} 1 + \mathrm{n}/3 & -3 \le \mathrm{n} \le -1 \\ 1 & 0 \le \mathrm{n} \le 3 \\ 0 & \text{elsewhere} \end{cases}$$

1) Determine and sketch signal $x(n)$
2) Sketch signal result if we;
   (a) First fold $x(n)$and delay resulting signal by far sample.
   (b) First delay $x(n)$ by far sample and then fold.

b) Explain in detail sampling of a signal. 06

Q.3 a) Explain in detail time variant / time invariant system. 06

b) Perform convolution sum using mathematical equation of convolution given 07

$h[n] = \{ 1, \underset{\uparrow}{2}, 1, -1 \}$

$x(n) = \{\underset{\uparrow}{1}, 2, 3, 1\}$

Q.4 a) Explain properties of z-transform. 06

b) Find the inverse z-transform of $X(z) = \frac{1+3z^{-1}}{1+3z^{-1}+2z^{-2}}, |Z| > 2$ 07

Q.5 Write short note on (any two):

(a) Block diagram of Digital Signal Processing. 07
(b) Quantization & encoding 06
(c) Properties of LTI system. 06

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SECTION – B

Q.6 a) Explain in detail properties of fourier transform. 06

b) Find the 4-point bFT of the sequence $x(n) = \cos n\pi/4$ 07

Q.7 a) Find the circular convolution of the two sequences $x(n) = \{1, 2, 2, 1\}$ and $x_2(n) = \{1, 2, 3, 1\}$ using concentric circle method. 06

b) Explain in detail properties of DFT. 07

Q.8 a) Determine the IDFT of X(K)={3, (2 + j), 1,(2 –j)} 06

b) Determine the Direct Form I realization of IIR filter. 07

Q.9 a) Realize the system function: 06

$$H(z) = \frac{1}{2} + \frac{1}{3}z^{-1} + z^{-2} + \frac{1}{4}z^{-3} + z^{-4} + \frac{1}{3}z^{-5} + \frac{1}{2}z^{-6}$$

b) Explain Lattice structure or FIR filter. 07

Q.10 Write a short note on (any two):

(a) Signal flow graph. 06

(b) Comparision between FIR & IIR filter. 06

(c) Relation between DFT & Z transform? 07

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-410
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-I)
Industrial Automation
[OLD]

[Time: Three Hours] **[Max. Marks: 80]**

Please check whether you have got the right question paper.

N.B
i. Q.No.1 and Q.No.6 are compulsory.
ii. Attempt three questions from each section.

Section A

Q.1 Solve any two 10
a) Define automatic control system. Draw & explain each block.
b) Draw ladder diagram for
i. ON/OFF operation
ii. Both directions of DC motor controlled by switches
c) Differentiate between actuator & final control element & compare both.

Q.2 a) What are the types of operations in Industries? How automation is achieved for them? Draw &explain basic automation system. 08
b) How a supervisory or digital control is applied to control temperature in any heat treatment process. Draw & explain control system. 07

Q.3 a) Draw & explain functional programmable logic controller. 08
b) How analog PLC operation is implemented? How processing is done? Explain 07

Q.4 a) What are the serial standards used for PLC. Explain all. 08
b) What are techno-commercial requirement & feasibility that decides level of automation? 07

Q.5 a) Draw & explain Modbus protocol. 08
b) How a liquid level in a tank is controlled by continuous control & discontinuous control? Explain if they applied separately &compositely. 07

Section B

Q.6 Solve any two 10
a) Define DCS. List out its advantages & applications.
b) What are the standard communication protocols used in SCADA? & also list out data variables acquired from different substation using SCADA system.
c) Differentiate between discrete & analog control using RTU.

Q.7 a) Draw & explain basic SCADA hardware configuration. 08
b) Discuss in detail functions of SCADA system. 07

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Q.8	a)	Draw & explain SCADA configuration for any conventional power generation	08
	b)	Draw & explain Input/output hardware system an DCS	07
Q.9	a)	Draw & explain basic DCS architecture.	08
	b)	List out various types of user interfaces in SCADA. Explain each.	07
Q.10	a)	Discuss in detail various ways of communication technologies	08
	b)	What is the role of field bus in DCS? Explain.	07

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Examination Nov/Dec 2019

Total No. of Printed Pages:1

SUBJECT CODE NO:- H-473

FACULTY OF SCINECE AND TECHNOLOGY

B.E. (EE) (Sem-I)

Elective-I: SAP Production Planning – I

[OLD]

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1. Questions number 1 from section A & question number 6 from section B are compulsory.
2. Answer any two from the remaining in each section

Section –A

Q.1	a)	Discuss the SAP production planning	05
	b)	What is business process? How SAP replicates business process.	05
Q.2	a)	Explain the concept of client in the hierarchy of SAP organizational structure.	08
	b)	How do you integrate the various organizational elements?	07
Q.3	a)	Describe the concept of Holiday calendar in SAP	08
	b)	Explain the use of organizational data and master data in production.	07
Q.4	a.	Describe the characteristics of Bill of Materials How to create BOM?	08
	b.	How to create,change & display the work center.	07
Q.5	Write a short note on		
	a)	Creation of Routing in PP	08
	b)	Master recipe in Advanced Routing functions.	07

Section – B

Q.6	a)	What is long term planning explain the key objectives of LTP?	05
	b)	Explain the strategy for planning with final Assembly	05
Q.7	a)	Explain the most famous lot sizing procedures	08
	b)	Describe the Rounding values & rounding profile.	07
Q.8	a)	Explain the material & vender master datas	08
	b)	Discuss the steps of het stock overview	07
Q.9	a)	Explain the types of Basic procurement	08
	b)	Explain the planned order creation in SAP system.	07
Q.10	Write a short note on		
	a)	Procurement life cycle	08
	b)	SAP logistics information system	07

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-474
FACULTY OF SCINECE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-I)
Elective-I: Industrial Management
[Old]

[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.6 from section B are compulsory
2. Answer any two from the remaining in each sections.

Section -A

Q.1 Answer any two of the following.
- a) Explain the different levels of management. What are the functions of management. 05
- b) Explain the contributions of Charles Babbage towards management. 05
- c) Explain in detail the objectives of management 05

Q.2
- a) Describe in detail the factors affecting productivity. 08
- b) Elaborate how do you increase the productivity of resources. 07

Q.3
- a) Explain in detail the objectives & functions of HRM 08
- b) Describe the methods of training. 07

Q.4
- a. Describe the sources of finance 08
- b. What is Book keeping? Explain 07

Q.5 Write a short note on any two 15
- a) Scope of marketing research
- b) Terms related to network planning methods
- c) Steps involved in PERT planning technique

Section – B

Q.6 Answer any two of the following
- a) Describe the flow of materials in manufacturing. 05
- b) Describe the material requirement planning technique 05
- c) Describe the buying techniques. 05

Q.7
- a) Explain the principles of labour acts 08
- b) Explain the minimum wages Act 07

Q.8
- a) Explain in detail the value & price 08
- b) Describe the demand forecasting methods 07

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Q.9	a)	Explain the different types of Banks	08
	b)	What are the pre- requisites for implementing ISO 9000 quality system	07
Q.10	Write the short note on		
	a)	Need for information	08
	b)	Management information categories	07

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-475
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-I)
Elective-I: Flexible AC Transmission System
[Old]

[Time: Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B.: i) Q. No.01 & Q. No.06 are compulsory.
ii) Attempt any two questions from each section from the remaining questions.
iii) Assume suitable data, whenever necessary.

Section – A

Q.1 Solve any five Questions 10
i) What are the objectives of FACTS.
ii) Write the difference between TSSC & TCSC
iii) Define SVC.
iv) What are different types of storages.
v) What is the best location of SVC
vi) What is necessity of compesation.
vii) What are different types of losses in STATCom.
viii) List the shunt connected controllers.

Q.2 a) Define FACTS and Explain the factors which limits the loading capability. 07
b) Explain different methods to control power flow in meshed system. 08

Q.3 a) Explain in brief the basic types of FACTS Controllers. 07
b) Explain the construction and working of single phase wave bridge FACTS converter. 08

Q.4 a) Enlist the objectives of static shunt compensator and Explain transient stability improvement. 07
b) Explain the construction and working of FC-TCR. 08

Q.5 Write a short on
a) UPFC 05
b) Benefits of FACTS controllers. 05
c) Power flow in parallel path 05

Section – B

Q.6 Solve any five questions 10
i) What are different constraints for operating UPFC.
ii) State salient features of UPFC.
iii) Enlist the objectives of static series compensators.
iv) What are the advantages TCSC
v) What is Bang-Bang control.
vi) What are the advantage of TCVR's
vii) How TCBR is used to improve the transient stability
viii) What is STATcom

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Q.7	a)	What are the objectives of static series compensator and explain any one objective in detail.	07
	b)	Explain the working of GCSC with a neat diagram and waveforms.	08
Q.8	a)	Explain with a neat diagram and output waveforms of TCVR & TCPAR of tap changers supplying a purely capacitive load.	07
	b)	Explain the switching converter based voltage and phase angle regulator.	08
Q.9	a)	Explain the NGH-SSR Damping scheme	07
	b)	Explain UPFC back to back voltage source converter.	08
Q.10	Write a short note on		
	a)	TSSC	05
	b)	Hybrid phase angle regulator	05
	c)	TCBR	05

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Total No. of Printed Pages:1

SUBJECT CODE NO:- H-476
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-I)
Elective-I: Power Electronics -II

[Time: Three Hours] **[OLD]** **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B.: 1) Q. No.1 & Q. No.6 are compulsory.
2) Attempt three questions from each section.

Section– A

Q.1 Solve any two 10
(a) Explain the switchig characteristics of IGBT.
(b) Differentiate between GTO & SCR.
(c) Describe different modes of operations of SCR.

Q.2 a) What are the power factor improvement methods in AC-DC power converter? Discuss in detail. 08
b) Discuss in detail extinction angle control in controlled rectifiers. 07

Q.3 a) What are different methods of voltage control of Inverter? Discuss 08
b) Explain the working principle of 3-Ø bridge Inverter on the 120° conduction mode. 07

Q.4 a) Explain single pulse width modulation technique in single phase Inverter. 08
b) For a 3-Ø full wave controlled rectifier derive an expression for an average output voltage [R-Load] 07

Q.5 Write notes on
(a) Power diode 08
(b) IGCT 07

Section – B

Q.6 Solve any two 10
(a) List out advantages & disadvantages of resonant invertors.
(b) Explain principle of flying capacitor multilevel inverter
(c) What are the merits & demerits of ZVS convertors.

Q.7 a) Explain diode clamped multilevel Inverter. 08
b) Describe working principle of cascaded multilevel Inverter. 07

Q.8 a) Explain in detail parallel resonant Inverter. 08
b) Give the comparison between ZCS & ZVS resonant converters. 07

Q.9 a) Discuss in detail Fly back converts 08
b) Explain class E resonant Inverter. 07

Q.10 Write notes on
(a) Push pull converter 08
(b) Application of multilevel Inverter. 07

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-477
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-I)
Elective-I: Digital System Design
[OLD]

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1. Questions No.1 and 6 are compulsory.
2. Attempt 3 questions from each section.

Section– A

Q.1 Attempt any two (2) from the following. 10
a) Explain I-V characteristics of ideal NMOS transistor.
b) Design XOR and OR logic gate using transmission gate.
c) State the layout design rule for CMOS technology.

Q.2
a) Draw and explain CMOS inverter with parasitic. 08
b) What do you mean by short channel effects in MOS. Explain with suitable figure? 07

Q.3
a) Design CMOS logic gate for 08
i) $F = \overline{(AB + C)D}$
ii) $F = \overline{AB + DE + C}$
b) What are the different types of CMOS logic families? Explain pass transistor logic. 07

Q.4
a) Explain self- aligned process in CMOS. 07
b) Explain the twin tub process of CMOS fabrication. 08

Q.5 Write short notes on 15
i. Transmission gate
ii. CMOS n- well fabrication.
iii. Pass transistor logic.

Section – B

Q.6 Attempt any two (2) from the following. 10
a) State the difference between concurrent statement and sequential statement.
b) State the necessity of Design for Testability.
c) Define with example.
i) Entity
ii) Architecture

Q.7
a) Explain VLSI design flow with flow diagram. 07
b) Explain the different VHDL modeling styles. 08

Q.8
a) Write a VHDL Code for 8:1 multiplexer. 07

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	b)	Write a VHDL code for SR Flip Flop.	08
Q.9	a)	Compare and contrast FPGA and CPLD.	08
	b)	With diagram explain full and partial scan.	07
Q.10	Write short Notes on:		15
	a)	EDA tools	
	b)	CPLD	
	c)	JTAG controller	

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-478
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-I)
Elective-I: Recent Trends in Power Systems
[Old]

[Time: Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B.:
- Question no 1 from section A and Question no 6 from section B are compulsory.
- Solve any two from remaining questions from each section.
- Assume suitable data, if required.

Section– A

Q.1 Explain the following terms for smart grid technology: 10

a) Smart grid
b) Wide area measurement system
c) GIS
d) Substation automation
e) Outage Management System

Q.2 a) Explain self healing and resilient grid in detail. 08
b) What are the international policies in smart grid. 07

Q.3 a) Explain Outage Management system with neat diagram in detail. 08
b) Explain phase shifting transformer in detail. 07

Q.4 a) Explain Intelligent Electronic devices in detail. 08
b) Explain phase Measurement unit in detail. 07

Q.5 a) Explain Geographic Information System in detail. 08
b) Explain smart substation with neat diagram in detail. 07

Section – B

Q.6 Attempt any five from the following: 10

a) What is the need of microgrid?
b) What are the advantages of microgrid?
c) Draw PV and IV characteristics of PV system.
d) What is cell to module and module to array is arranged?
e) Draw flywheel energy storage system.
f) Enlist the types of filters.
g) What are the configuration of PV system?

Q.7 a) Explain formation of micro grid. What are the issues of interconnection in micro grid? 08
b) Explain captive power plant in detail. 07

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Q.8	a)	Explain building integrated PV system.	08
	b)	Enlist the PV cell manufacturing process. Explain Ribbon Silicon technology in detail.	07
Q.9	a)	Explain various types of energy storage systems.	08
	b)	Explain Standalone and grid interactive PV system.	07
Q.10	a)	Write a short note on shunt filters.	08
	b)	Explain Variable speed wind generators in detail.	07

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-497
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE) (Sem-II)
Elective-II: Embedded System
(Revised)

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B
1. Q.No.1 & Q.No.6 are compulsory.
2. Solve any two questions from remaining from each section.
3. Assume suitable data wherever necessary.
4. Figures to right indicate full marks.

Section A

Q.1 Solve any 2 questions from following 10
a) Explain software design testing in ES
b) Discuss on chip WDT in ARM processor
c) Discuss in detail with neat diagram SPI protocol
d) Explain the features of ARM processor in detail.

Q.2 a) Explain in detail recent trends in ES. 08
b) Discuss common design metrics & its optimization in ES. 07

Q.3 a) Explain in detail with neat diagram about ARM core architecture. 07
b) Explain logical instructions & conditional instructions in detail. 08

Q.4 a) Explain the following on chip features of ARM based LPC 2148 microcontroller. 08
i) PLL
ii) RTC

b) Explain in detail memory management within ARM core. 07

Q.5 Write short note on: 15
a) CAN bus
b) ARM processor family
c) Load-store instructions

Section B

Q.6 Answer any two from following 10
a) Write a short note on different RTOS services
b) Explain MUCOS-II in detail
c) Explain kernel structure of MUCOS II in detail
d) Write a short note on AT command for GSM.

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Q.7	a)	Explain in detail touch screen interfacing with ARM 7.	08
	b)	Explain in detail SPI interfacing with ARM 7.	07
Q.8	a)	Discuss in brief need of interfacing & interfacing techniques in ES.	07
	b)	Explain porting of RTOS in detail.	08
Q.9	a)	Discuss features of MUCOS-II RTOS in detail.	07
	b)	Explain the different types of Inter task communication mechanism supported by MUCOS-II kernel.	08
Q.10	Write short note on		15

a) RTOS mailbox
b) Task scheduling
c) Message queues
d) ISR

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