

Total No. of Printed Pages:2

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

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

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

Section A

- | | | |
|-----|--|----------------|
| Q.1 | Solve any five questions. | 10 |
| | <ol style="list-style-type: none"> a) What are infinite bus bars? b) Define small signal stability? c) What is static excitation system? d) Draw load Vs frequency characteristics. e) What is the role of governor mechanism in power system operation and control f) Draw wave form of spatial MMF wave in air gap g) Define dqo axis components. | |
| Q.2 | <ol style="list-style-type: none"> a) Derive the expression for swing equation of synchronous machine. b) Explain control and protective functions in excitation systems. | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) Explain the simplified model of synchronous machine. b) Explain the stator voltage equations and rotor flux linkage equation in term of dqo components. | 08
07 |
| Q.4 | <ol style="list-style-type: none"> a) Explain classical transfer function of hydraulic turbine with its special characteristics. b) Explain state-space representation in stability of dynamic system. | 08
07 |
| Q.5 | Write short note on. | |
| | <ol style="list-style-type: none"> a) Automatic voltage regulator b) Park's transformation. c) A. C excitation system. | 05
05
05 |

Section B

- Q.6 Solve any five questions. 10
- a) What is static VAR system?
 - b) State how a transmission line generator absorbs reactive power.
 - c) What is load frequency control?
 - d) What is shunt reactor
 - e) What is contingency analysis?
 - f) What is incremental cost?
 - g) What is economic load dispatch?
- Q.7 08
- a) Explain and derive the expression for long term hydrothermal scheduling problem.
 - b) Explain the concept of reactive power production and absorption in power system equipments. 07
- Q.8 08
- a) Explain SCADA system application in energy management system.
 - b) Explain in detail energy management system and its implementation steps. 07
- Q.9 08
- a) Explain power system security assessment in detail.
 - b) Explain economic load dispatch problems formulation. 07
- Q.10 write short notes on:
- a) Distribution system voltage regulation. 05
 - b) Preventive, emergency and restorative states of power system. 05
 - c) automatic generation control 05

Total No. of Printed Pages:2

SUBJECT CODE NO: H-248
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EE)
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
- i) Question number 1 from section A and question number 6 from section B are compulsory
 - ii) From the remaining questions solve any two questions from each section
 - iii) Figure to the right indicate full marks
 - iv) Assume suitable data, if necessary
 - v) Use of non-programmable calculator is allowed

Section A

- | | | |
|-----|--|----|
| Q.1 | a) Explain bill of material in discrete manufacturing | 05 |
| | b) Explain reasons for variances | 05 |
| Q.2 | a) Explain master data in process manufacturing | 08 |
| | b) Write short note on process management | 07 |
| Q.3 | a) Write a short note on scheduling planned order | 08 |
| | b) Explain collective confirmation | 07 |
| Q.4 | a) Explain process integration in discrete manufacturing | 08 |
| | b) Write a short note on process message evaluation | 07 |
| Q.5 | a) Explain routing in discrete manufacturing | 08 |
| | b) Write a short note on material requirement planning in repetitive manufacturing | 07 |

Section B

- | | | |
|-----|---|----|
| Q.6 | a) Explain forecasting in sales and operation planning | 05 |
| | b) Write a short note on standard analysis in flexible planning | 05 |
| Q.7 | a) Explain direct procurement in optimization and production planning | 08 |
| | b) Write a short note on finite scheduling | 07 |
| Q.8 | a) Explain ECM configuration | 08 |
| | b) Explain engineering change order in detail | 07 |

- Q.9 a) Explain rough cut planning profile
- b) Explain standard analysis in flexible planning

08
07

- Q.10 a) Explain pipe line material
- b) Write a short note on Dispatching

08
07

Total No. of Printed Pages:2

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

[Time: Three Hours]

[Max.Marks: 80]

- N.B Please check whether you have got the right question paper.
- i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
 - ii) Attempt any two questions from the remaining questions in each section
 - iii) Assume suitable data ,if necessary.

Section A

- | | | |
|-----|---|----------|
| Q.1 | Solve any five. | 10 |
| | <ol style="list-style-type: none"> a) Explain the construction of solar cell. b) What is meant by pitch angle? c) What is solar pond? d) Which material is used to construct solar cell? e) What are wind farms? f) What is tethering? g) What is the energy conversion efficiency of wind turbine for a given swept area? | |
| Q.2 | <ol style="list-style-type: none"> a) Explain the construction and working of solar cell, with neat diagram draw V-1 characteristics of solar cell. b) Explain principle, construction and working of flat plate solar thermal collector with neat diagram | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) What is wind power generation? Explain different components of wind energy conversion system .write the advantages of wind power. b) Explain the concept of active and passive heating of buildings. | 08
07 |
| Q.4 | <ol style="list-style-type: none"> a) What are the essential features for site selection of wind farm? b) Explain the main application of wind energy. | 08
07 |
| Q.5 | <ol style="list-style-type: none"> a) Distinguish between renewable and nonrenewable energy sources. b) Write short note on solar arrays. | 08
07 |

Section B

- Q.6 Solve any five. 10
- a) What is the principle of wind energy conversion?
 - b) What are the different organic materials used in biomass plant?
 - c) What are the advantages of tidal waves?
 - d) What is geothermal power?
 - e) What is the function of aerobic digestive?
 - f) What is gasifier?
 - g) Which are the main biomass energy resources?
- Q.7 08
- a) What are the different methods of biomass conversion?
 - b) Explain advanced type of bio gas plant with its advantages? 07
- Q.8 08
- a) Explain working of open cycle type MHD power plant in details.
 - b) Explain the principle of MHD generation including Hall Effect. 07
- Q.9 08
- a) Explain the application of geothermal energy.
 - b) What is the main application of gasifier. 07
- Q.10 08
- a) Explain the fuel cells in details.
 - b) Explain the concept of tidal power generation in details. 07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-252
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE)
Elective-II: Illumination Engineering
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

- N.B Please check whether you have got the right question paper.
- i) Question 1 and Question 6 are Compulsory.
 - ii) Solve any two questions from remaining questions from Section A and Section B each.
 - iii) Assume suitable data.

Section A

- | | | |
|-----|--|----------|
| Q.1 | Solve any Five | 10 |
| | <ol style="list-style-type: none"> (a) Define illumination (b) Mention properties of good illumination (c) Define luminous intensity. (d) What are various method for producing light. (e) List various light sources. (f) Define Lux (g) What is polar Curve (h) Define Candle power. | |
| Q.2 | <ol style="list-style-type: none"> (a) Explain the dependence of human activities on light. (b) Explain different methods of controlling natural light. | 08
07 |
| Q.3 | <ol style="list-style-type: none"> (a) Why CFL lamps are becoming more popular nowadays. Discuss technically. (b) Explain with a neat diagram the principle of operation of a sodium vapour lamp. | 08
07 |
| Q.4 | <ol style="list-style-type: none"> (a) Discuss the effects of voltage variation on the life and illumination as regards tungsten filament lamp and florescent lamp. (b) Discuss good and bad effects of lighting and perfects level of illumination. | 08
07 |
| Q.5 | <ol style="list-style-type: none"> (a) Define the following <ol style="list-style-type: none"> (1) Beam Factor (2) Flux (3) Solid angle (4) Plane angle (b) Explain construction of optical fibre. | 08
07 |

Section B

- Q.6 Solve any five 10
- (a) List types of Glare
 - (b) List the effect of Glare.
 - (c) What are primary colors
 - (d) What are drawbacks of direct lighting system
 - (e) What system of lighting should be recommended for drawing office.
 - (f) State inverse square law
 - (g) Write the use of reflectors
 - (h) How projectors are classified according to the beam spread.
- Q.7 (a) Explain Switching Control of Lighting 08
 (b) Explain Photovoltaic lighting with suitable diagram. 07
- Q.8 (a) Explain problems of point by point method 08
 (b) In context with cold lighting explain optical fibre cable. 07
- Q.9 (a) Explain central system in case of emergency lighting. 08
 (b) State the classification of road according to BIS 07
- Q.10 (a) With suitable example explain pay back calculation in lighting. 08
 (b) What is zonal cavity method for general lighting design explain. 07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-494
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE)
Elective-I: Neural Network and Fuzzy Logic
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- (i) Q5 and Q10 are compulsory.
 - (ii) Solve any two questions from Q1, Q.2, Q.3 and Q.4 in section A.
 - (iii) Solve any two questions from Q.6, Q.7, Q.8 and Q.9 in section B.
 - (iv) Figures to the right indicate full marks.
 - (v) Assume suitable data wherever necessary and mention it clearly

Section A

- | | | |
|-----|---|----|
| Q.1 | (a) Discuss the simplified model of an artificial neuron. | 07 |
| | (b) Explain the training and classification of continuous perception with an example. | 08 |
| Q.2 | (a) Discuss back propagation algorithm with your own training sets, and explain. | 07 |
| | (b) Discuss the fuzzy rule based system. | 08 |
| Q.3 | (a) Explain in detail different membership functions of fuzzy logic system. | 07 |
| | (b) Mention the need for the De-Fuzzification, explain the three types of De-fuzzification with its formulae. | 08 |
| Q.4 | (a) Give suggestions to improve and modify back propagation network | 07 |
| | (b) Discuss in detail about derivation of rule in fuzzy logic system. | 08 |
| Q.5 | Write short notes on any two | 10 |
| | (i) Application of fuzzy logic | |
| | (ii) PID control | |
| | (iii) Speed control of AC motors. | |

Section B

- | | | |
|-----|---|----|
| Q.6 | (a) Discuss characteristics of ANN and potential applications of ANN. | 07 |
| | (b) Differentiate between classical and fuzzy relations. | 08 |
| Q.7 | (a) Explain about different learning rules of Neural networks | 07 |
| | (b) Discuss Hetro associative memory. | 08 |
| Q.8 | (a) Discuss the application of neural networks in image processing | 07 |
| | (b) Explain Learning constant. | 08 |

- Q.9 (a) Explain how neural networks are used in pattern classification 07
(b) Discuss adaptive resonance theory. 08
- Q.10 Write short notes on any two 10
- (i) Inverted Pendulum
 - (ii) Crisp relations
 - (iii) Temperature control by fuzzy logic

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-116
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE)
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 |
| | <ol style="list-style-type: none"> 1) What is the principle of charge simulation method? 2) State the applications of insulating material in power cables. 3) What do you mean by “Impulse” current? 4) Define “Thermal Break Down”? 5) Write the difference between commercial liquid & pure liquids 6) What is treeing & tracking 7) Define “Electric stress”? 8) What is tesla coil? | |
| Q.2 | a) Explain with neat diagram the procedure to control electric field intensity in HV equipment. | 07 |
| | b) Explain town sends criteria of Breakdown in gases; with neat sketches. | 08 |
| Q.3 | a) State & explain Paschen’s law. | 07 |
| | b) Explain how will you control surge voltages. | 08 |
| Q.4 | a) Explain with neat sketches, cockroft Walton voltage multiplier circuit when it is loaded & unloaded. | 07 |
| | b) Describe the construction principle of operation and application of multistage marx’s surge generator | 08 |
| Q.5 | Write a short note on | |
| | 1) Abraham voltmeter | 05 |
| | 2) Finite element method | 05 |
| | 3) “Van De Graff” generator | 05 |

Section- B

- Q.6 Solve any five questions. 10
- 1) Draw the circuit diagram of capacitance potential divider.
 - 2) What are different methods for lightning protection of overhead line?
 - 3) Define creeping distance.
 - 4) Define insulation co- ordination.
 - 5) What is Rogowski coil?
 - 6) What are the advantages of CVT measurement in HVAC?
 - 7) Define “Di-electric constant”?
 - 8) What are the limitations of series resistance micrometer?
- Q.7 a) Discuss briefly the different methods of measuring high DC voltages what are the limitations of each method? 07
- b) What are the mechanisms by which lightning strokes develop and induce overvoltages ‘ on overhead power lines. 08
- Q.8 a) Explain any one method of testing of pin type insulators with reference to Indian standard specifications. 07
- b) With neat sketches explain the lighting phenomenon in detail. 08
- Q.9 a) Explain the working of oscilloscope for impulse measurement with neat sketches. 07
- b) What are the causes of switching & power frequency over voltages? How they are controlled in power system. 08
- Q.10 Write a short note on
- 1) Natural causes of over voltages 05
 - 2) Partial discharge measurement 05
 - 3) Radio interference measurement. 05

Total No. of Printed Pages:02

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

[Time: Three Hours]

[Max.Marks: 80]

Please check whether you have got the right question paper.

- N.B
1. Q. No. 1 and Q. No. 6 are compulsory.
 2. 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) Explain state transition matrix?
 - b) What is state observer?
 - c) What is meant by diagonalization?
 - d) Explain the concept of sampling process.
 - e) What is pole placement by state feedback?
 - f) Write the state model of n^{th} order system.
- Q.2 15
- a) Find state transition matrix using
 - 1) Laplace transform method
 - 2) Power series method $A = \begin{bmatrix} 0 & -1 \\ 2 & -3 \end{bmatrix}$
- Q.3 07
- a) Describe Krasovskis method and variable gradient method of constructing lyapunov function.
- 08
- b) What are the necessary and sufficient conditions for arbitrary pole placement?
- Q.4 08
- a) Define stability of a digital control system and discuss how Jury-stability criterion is applied for stability investigation for such systems.
- 07
- b) Obtain Eigen value, Eigen vector and Model matrix for the matrix
- $$A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & -11 & -6 \end{bmatrix}$$
- Q.5 15
- Write short note on.
- 1) State Regulator design
 - 2) State transition matrix
 - 3) Bilinear transformation

Section B

- Q.6 Answer the five 10
- What are the methods available for the analysis of nonlinear system.
 - Define lyapunov stability.
 - Differentiate classical and fuzzy set.
 - What is fuzzy relation?
 - List the fuzzy set operations.
 - Define fuzzification.
- Q.7 a) Explain in detail common physical nonlinearities. 08
b) State lyapunov's stability theorem. 07
- 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) Explain Biological Neuron model and compare it with artificial neural network. 08
b) Explain supervised and unsupervised learning. 07
- Q.10 Write short notes on: 15
- Jump Resonance
 - Different types of membership functions
 - Biological Neuron model

Total No. of Printed Pages:2

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

[Time: Three Hours]

[Max. Marks:80]

Please check whether you have got the right question paper.

N.B

- i) Q. No.01 & Q. No.06 are compulsory.
- ii) Attempt any two questions from remaining questions of each sections.
- iii) Assume suitable data if necessary.

Section – A

- | | | |
|-----|---|----------|
| Q.1 | Answer any five questions | 10 |
| | <ol style="list-style-type: none"> (a) List down the design conditions for electrical panels. (b) Enlist the different types of lighting arrangements. (c) Define Depreciation factor. (d) Give the difference between joint box system & looping in systems (e) Define Fuse & Circuit breaker (f) Define terms lumen & lux. (g) Define earthing & give its types. | |
| Q.2 | <ol style="list-style-type: none"> (a) Explain different types of electrical installations & Write examples in each type. (b) Draw neat labeled diagram underground service connection & list out the material required. | 08
07 |
| Q.3 | <ol style="list-style-type: none"> (a) What are the steps involved in the process of Estimation & Costing. (b) Explain the lighting & power sub circuit rule for an electrical installation. | 08
07 |
| Q.4 | <ol style="list-style-type: none"> (a) An office of size 40m x 20m is to be illuminated by 40 watt fluorescent lamp of lumen output 2700 lumens. The average illumination required at the work place is 200 lux. Calculate the no. of lamps required to be fitted in the office. (b) Explain various types of light sources. | 08
07 |
| Q.5 | Write a short note on | 15 |
| | <ol style="list-style-type: none"> a) Practical lighting schemes b) Earthing c) Significance of low earth resistance. | |

Section – B

- Q.6 **Solve any five questions** 10
- Define PFC & APFC panel installation.
 - What are the types of conduits that are used for the motor installation?
 - List out types of Substations
 - Define relay & overload relay.
 - What do you mean by limit & float switches.
 - Draw the single line diagram of pole mounted substation
 - Define circuit breaker.
- Q.7 (a) State reasons for establishing substations & mention the names of various types of substation. 07
- (b) Explain Safety requirements of substations. 08
- Q.8 (a) Explain general requirements of electrical installation in small industries. 07
- (b) Explain design considerations of electrical installation of commercial buildings. 08
- Q.9 (a) State & explain inching circuit for 3ϕ I.M. 07
- (b) Enlist & explain different starting methods of 3ϕ squirrel Cage induction motor. 08
- Q.10 **Write a short note on** 15
- Indoor Substation
 - Relay & Switch
 - Busbar & Busbar chamber

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-250
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE)
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 from each sections.
3. Assume suitable data .

Section A

- | | | |
|-----|---|----|
| Q.1 | Solve any five | 10 |
| | <ol style="list-style-type: none"> a) Give the principle of dc motor. b) Define sag. and tension. c) State merits of electric traction system. d) What is the function of battery in electric traction system. e) Why 3 phase induction motor is not used in electric traction. f) State main requirements of ideal traction system . | |
| Q.2 | <ol style="list-style-type: none"> a) Explain signaling interference in telecommunication system. | 07 |
| | <ol style="list-style-type: none"> b) Explain the requirements for ideal traction and show which drive satisfy almost all the requirements. | 08 |
| Q.3 | <ol style="list-style-type: none"> a) Explain constructional details of Dc traction motors with neat diagram. | 07 |
| | <ol style="list-style-type: none"> b) Derive the sag and tension formulae for trolley wire system. | 08 |
| Q.4 | <ol style="list-style-type: none"> a) Give the classification of electric traction. Explain any one. | 07 |
| | <ol style="list-style-type: none"> b) Explain suitability of series motors for traction duties. | 08 |
| Q.5 | Write the short note on following | 15 |
| | <ol style="list-style-type: none"> a) Single phase low frequency A.c system b) Compensated repulsion motors c) Drvm controller . | |

Section – B

- Q.6 Solve any five 10
- Give the methods of traction motor control.
 - What is mean by braking in electric traction system .
 - What are the factors which affect the schedule speed of train.
 - What are advantages of thyristor control of traction motors.
 - What is the use of interlocks
 - What type of machine used in domestic refrigerator and why?
- Q.7 a) Discuss in detail the methods of electric braking for traction motors. 07
- b) Explain series-parallel controllers. 08
- Q.8 a) Explain tractive effort calculations . 07
- b) Explain central air conditioning system. 08
- Q.9 a) Explain Regenerative braking system. 07
- b) Explain use of Metaldyne and megavolt in traction control. 08
- Q.10 Write short note on following 15
- Magnetic track braking system
 - Domestic refrigerators
 - Water cooler

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-249
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE)
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 |
| | <ol style="list-style-type: none"> a) What is the most common power quality problem? b) Define transient over voltages. c) What is Ferro resonance. d) Differentiate between linear loads and non- linear loads. e) Give the basic principles of over voltage protection of load equipment's. f) Name any two types of sag mitigation devices. g) State at least two reasons for increased power quality concern. | |
| Q.2 | <ol style="list-style-type: none"> a) What do you understand by power quality? Explain. b) What are the terms associated with power quality. | <p>08</p> <p>07</p> |
| Q.3 | <ol style="list-style-type: none"> a) Discuss the effect of sag on equipment's behaviour. b) Discuss in detail about transients. | <p>07</p> <p>08</p> |
| Q.4 | <ol style="list-style-type: none"> a) State and explain the different harmonic sources from commercial loads. b) Explain how lightening results into transient over voltage. | <p>07</p> <p>08</p> |
| Q.5 | Write short note on following (any three) <ol style="list-style-type: none"> a) Power quality disturbances b) Total harmonic distortion c) Devices for voltage regulation d) Principles of over voltage protection | 15 |

Section – B

- Q.6 Solve any five 10
- a) What is the effect on transformer due to harmonics.
 - b) What is the importance of power quality monitoring
 - c) What is the types of power quality measurement equipment
 - d) What is the use of oscilloscope
 - e) What are the reasons for grounding
 - f) What are the impact poor quality on reliability.
 - g) What are the philosophies of IEEE 519 standards.
- Q.7 a) Explain the impact of harmonic distortion on 08
- 1) Capacitors
 - 2) Energy and demand metering
- b) Explain in detail the inter harmonics. 07
- Q.8 a) Introduce the different grounding schemes used for safety and write in brief on the proper 07
grounding practices.
- b) Explain assessment of power quality measurement data. 08
- Q.9 a) Explain power quality monitoring considerations. 07
- b) Explain how a spectrum analyzer is used for monitoring power quality and gives the 08
format for a typical harmonic analyzer output.
- Q.10 Write short notes on following (any three) 15
- a) Reliability indices
 - b) Power quality monitoring survey
 - c) IEEE 1159 standard
 - d) Isolated ground for solution of grounding problems.

Total No. of Printed Pages:02

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

[Time: Three Hours]

[Max. Marks: 80]

Please check whether you have got the right question paper.

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

Section A

- | | | |
|-----|---|----------|
| Q.1 | Solve any two:- | 10 |
| | <ol style="list-style-type: none"> a) Differentiate between Actuator & final control element. b) What is automation? List out its advantages. c) Draw & explain MODBUS protocol. | |
| Q.2 | <ol style="list-style-type: none"> a) What is mean by mechanical actuators? Draw & explain applications of levers, linkages & gear boxes. b) Write the differences between machine automation process automation, factory automation & system automation. | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) How level of automation is described as manually operated, semi-automatic & fully automatic. b) Why digital control, supervisory control as required? How it is achieved? What are their features, merits & demerits? | 08
07 |
| Q.4 | <ol style="list-style-type: none"> a) What are the serial standards used for PLC? Explain all. b) What are techno-commercial requirement & feasibility that decides levels of automation? | 08
07 |
| Q.5 | <ol style="list-style-type: none"> a) Draw & explain functional programmable logic controller. b) How a liquid level in a tank as controlled by continuous control & discrete control? Explain if they applied separately & compositely. | 08
07 |

Section B

- Q.6 Solve any two- 10
- a) What is SCADA? List out its advantages.
 - b) What are the standard communication protocols? Explain.
 - c) Discuss significance of automatic substation control.
- Q.7 a) Draw & explain basic SCADA hardware configuration. 08
 b) Draw & explain data logger. 07
- Q.8 a) How analog & discrete control as obtained using remote control unit (RTU) in the field. Explain 08
 b) List out various types of user interfaces in SCADA. Explain each. 07
- Q.9 a) What are the types of displays used in DCS? Draw & explain. 08
 b) Draw & explain input & output hardware system in DCS. 07
- Q.10 a) What is the role of field bus in DCS? Explain. 08
 b) Discuss in detail automatic substation control. 07

Total No. of Printed Pages:3

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

[Time: Three Hours]

[Max. Marks:80]

Please check whether you have got the right question paper.

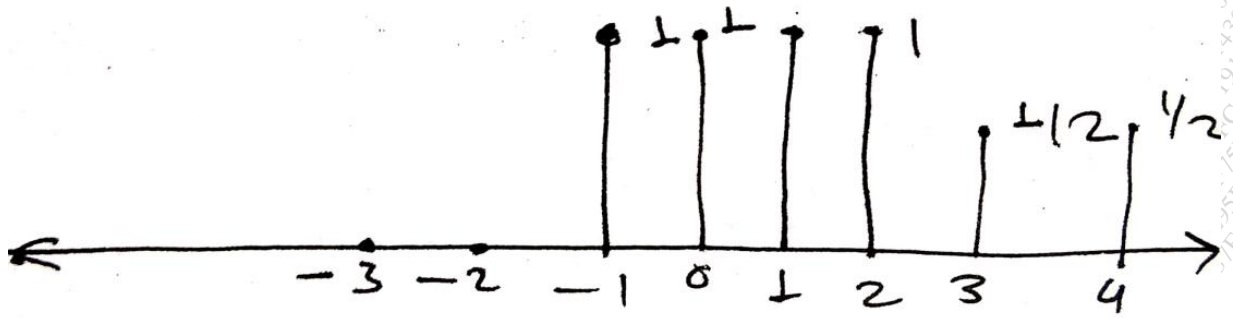
- N.B
- i) Q. No.1 is compulsory. Solve any two Questions from remaining questions of Section A
 - ii) Solve any three questions from Section B.
 - iii) Assume suitable data if necessary.

SECTION – A

- Q.1 Solve 14
- a) Design ROC in the Z – Transform
 - b) Design static and dynamic system.
 - c) Enlist different advantages OR DSP.
 - d) Design time delay and time advance operation.
 - e) Design Multichannel & multi-dimensional signal.
 - f) Define energy and power signal.
 - g) Design aliasing of signal.
- Q.2 06
- a) Explain Digital signal processing with block diagram
 - b) The analog signal given below is sampled by 600 samples per second. 07

$$x(t) = 2 \sin 480\pi t + 3 \sin 720 \pi t$$
 Calculate
 - a) NY Quist sampling rate
 - b) Maximum frequency
 - c) What are frequencies in radians in the resulting discrete signal x (n).
- Q.3 06
- a) Prove $FD [TD (x(n))] \neq TD [FD (x(n))]$ where FD & TD is folding & time delay operation. 07
 - b) A discrete time signal is shown in fig. sketch following signals
 - a) $x(n - 2)$
 - b) $x(4 - n)$
 - c) $x(n + 2)$
 - d) $x(n) \cup (2 - n)$

e) $x(n - 1] \cdot \delta(n - 3)$



Q.4 a) Perform convolution of given sequences using tabular method 06

$$h[n] = \{ \underset{\uparrow}{1}, \underset{\uparrow}{2}, \underset{\uparrow}{1}, \underset{\uparrow}{-1} \}, x(n) = \{ \underset{\uparrow}{1}, \underset{\uparrow}{2}, \underset{\uparrow}{3}, \underset{\uparrow}{1} \}$$

b) Determine the pole – zero plot for the system described by difference equation. 07

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

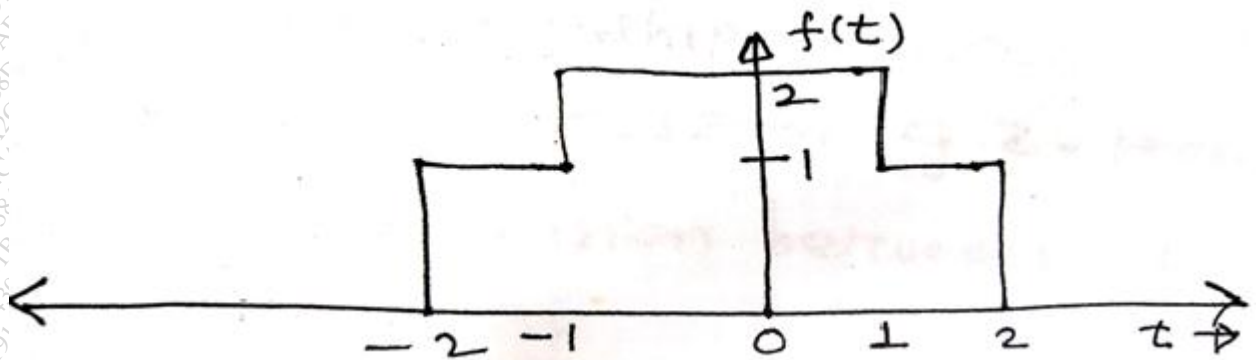
Q.5 Write short note on (any two) 07

- a) Sampling of signal 07
- b) Properties of Z – transform 06
- c) Causal & non casual system. 06

SECTION – B

Q.6 a) Explain the properties of Fourier transform. 06

b) Find the Fourier transform of the signal shown in fig. 07



Q.7 a) Explain properties of DFT 06

b) Derive the DFT of the Sample data sequence 07

$$x(n) = [\perp, \perp, 2, 2]$$

Q.8 a) Explain lattice structure of FIR Sitter. 06

b) Find FFT of sequence 07

$$x(n) = \{\perp, \perp, \perp, \perp, \perp, \perp, \perp, \perp\}$$

Q.9 a) Realize the second order digital sifter $y(n) = 2r \cdot \cos(\omega_0)$ 06

$$y(n-\perp) - r^2 \cdot y(n-2) + x(n) - r \cdot \cos(\omega_0) x(n-1)$$

b) Obtain cascade realization with minimum number of multipliers for the system function. 07

$$H(z) = \left(\frac{1}{2} + z^{-1} + \frac{1}{2}z^{-2}\right) \cdot \left(1 + \frac{1}{3}z^{-1} + z^{-2}\right)$$

Q.10 Write a short note on (Any two)

a) Signal flow graph 06

b) Relationship between Fourier transform & Z – Transform 06

c) Comparison between FIR & IIR Sitter. 07

Total No. of Printed Pages:2

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

[Time: Three Hours]

[Max. Marks: 80]

- N.B Please check whether you have got the right question paper.
- i) Q. No.1 and Q. No.6 are compulsory.
 - ii) Solve any two questions from section 'A' and 'B' Excluding compulsory question.
 - iii) Assume suitable data.

Section A

- | | | |
|-----|--|----------------|
| Q.1 | Attempt any five. | 10 |
| | <ol style="list-style-type: none"> a) Write the classification of Relays b) What is function of C.T. and P.T c) Define i) Pick up time, ii) Time delay. d) Define C.T burden. e) What are the various types of faults which can occur in a generator f) What is IDMT Relay? g) What are the advantages of static relay? | |
| Q.2 | <ol style="list-style-type: none"> a) Describe with neat Sketch the operation of solenoid and plunger type relay. b) Derive Torque Equation for induction type relay. | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) Explain current circulating protection of Bus bar. b) Describe use of Buchholz relay for transformer protection | 08
07 |
| Q.4 | <ol style="list-style-type: none"> a) Explain different types of faults occurred in alternator. b) Explain harmonic restraint relay. | 08
07 |
| Q.5 | Write a short note on | |
| | <ol style="list-style-type: none"> a) Restricted Earth fault protection. b) Summation Transformer c) Negative sequence relay | 05
05
05 |

Section –B

- | | | |
|-----|---|----|
| Q.6 | Attempt any five | 10 |
| | <ol style="list-style-type: none"> a) Give the classification of CB. b) What is Arc phenomenon? c) Classify Oil CB d) What is surge absorber e) Explain ELCB f) Application of SF₆ CB g) Advantage of minimum Oil circuit breaker | |

- Q.7 a) With neat diagram, explain the working and application of vacuum circuit Breaker. 08
 b) Explain the working of air blast circuit-breaker with reference of i) Axial Blast 07
 ii) Cross blast
- Q.8 a) Explain in details Microprocessor Based over current relay. 08
 b) With neat block diagram. Explain the operating principle of Peterson coil. 07
- Q.9 a) What is resistance switching? Derive an expression for “R” critical. 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 20 Hz. P.f. 0.15. Assume fault is also Earthed.
- Q.10 Write a short note on
 a) Auto reclosing 05
 b) MCB 05
 c) Lighting Arrester 05

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-307
FACULTY OF SCIENCE & TECHNOLOGY
B.E. (EEP/EE/EEE)
Electrical Drives
(Revised)

[Time: Three Hours]

[Max. Marks: 80]

Please check whether you have got the right question paper.

- N.B
- 1) Q.1 and Q.6 are compulsory.
 - 2) Solve any two questions from Q.2 to Q.5 and Q.7 to Q.10.
 - 3) Assume suitable data if required.
- Section A
- Q.1 Attempt any five. 10
- a) List out the advantages of electric drives.
 - b) What are the functions of power modulator?
 - c) Mention the parts of electric drives.
 - d) What is meant by mechanical characteristics?
 - e) What is meant by load equalization?
 - f) State the advantages of dc chopper drives.
- Q.2 07
- a) Explain in detail a four quadrant operation of motor driving hoist load.
 - b) Derive the fundamental torque equation and explain the significance of each term. 08
- Q.3 07
- a) Explain the operation of closed loop speed control scheme with inner current control loop.
 - b) A motor is used to drive a hoist motor characteristics are given by way of 08
- Quadrant I, II and IV:- $T = 200 - 0.2 N$, Nm
 Quadrant II, III, and IV :- $T = -200 - 0.2 N$, Nm
 Where N is the speed in rpm when hoist is loaded, the load torque $T_1 = 100Nm$ and when it is unloaded, net load torque $T_1 = -80Nm$ obtain the equilibrium speed for operation in all four quadrants.
- Q.4 07
- a) Explain the operation of 1ϕ half controlled rectifier control of dc separately excited motor for continuous conduction mode with aid of diagram and waveforms. Also obtain the expression for motor terminal voltage and speed.
 - b) A 230V, 960 rpm and 200A separately excited dc motor has an armature resistance of 0.02Ω , the motor is fed from a chopper which provides both motoring and braking operations the source has a voltage of 230V. Assuming continuous conduction. Calculate 08
- i) Duty ratio of chopper for motoring operation at 350 rpm and rated torque.
 - ii) Duty ratio of chopper for braking operation at rated torque and 350 rpm.

- Q.5 Write short notes on following. 15
- a) Constant torque and constant power control
 - b) Plugging braking of dc drives
 - c) Chopper fed dc drives

Section B

- Q.6 Attempt any five 10
- a) What are the three regions in the speed torque characteristics in the induction motor?
 - b) What are the different methods of speed control of Induction motor?
 - c) Mention the applications of stator voltage control.
 - d) What are the advantages of v/f control of induction motor?
 - e) List out the commonly used synchronous motors.
 - f) What are the advantages of brushless DC motor Drives?

- Q.7 a) Explain the operation of constant V/F control of induction motor. 07
- b) A 440V, 3 ϕ , 6 pole, 945 RPM data connected induction motor has the following 08
parameters referred to stator side
- $$R_s = 2\Omega \quad X_s = 3\Omega$$
- $$R_r = 2\Omega \quad X_r = 4\Omega$$

When driving a fan load of at rated voltage and rated speed, the motor speed is controlled by stator voltage control. Determine motor terminal voltage, current and torque at 800 Rpm.

- Q.8 a) Explain the operation of static scherbius drive for 3 ϕ ship ring induction motor. 07
- b) Describe the operation of self-controlled synchronous motor drive employing load commutated inverter. 08

- Q.9 a) What is the basic difference between true synchronous mode and self-control mode for variable frequency control of synchronous motor? 07
- b) A 5MW, 3 ϕ , 11 KV, stir connected 6 pole, 50 Hz, 0.9 leading power factor synchronous motor has $X_s = 10\Omega$ and $R_s = 0\Omega$. 08
The rated field current is 50A. The machine is controlled by variable frequency control at constant v/f ratio up to base speed and constant V above base speed.

Determine:

- 1) The torque and field current for rated armature current at 750 rpm and 0.8 P.F.(Leading)

- Q.10 Write short notes on 15
- 1) Brushless d.c motor drive
 - 2) Rotor resistance control of Induction motor (static)
 - 3) Industrial application of AC drives.

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-474
FACULTY OF SCIENCE & TECHNOLOGY
B.E. (EEP/EE/EEE)
Elective – I : Industrial Management
(Revised)

[Time: Three Hours]

[Max. Marks:80]

Please check whether you have got the right question paper.

N.B	1) Q. No.1 from Section A & Q.No.6 from Section B are compulsory. 2) Answer any two from the remaining in each section.	
	Section – A	
Q.1	Answer any two of the following. a) Explain scientific Management. b) Explain what are the principles of Management. c) Give the brief historical Prospective of Management.	05 05 05
Q.2	a) Explain the concept of economics in decision making process. b) Describe in detail the production planning & control.	08 07
Q.3	a) Explain the principles of a good HR Policy. b) What are the advantages of Employee Training?	08 07
Q.4	a) Explain the different types of Capital. b) Explain the difference between debentures and shares.	08 07
Q.5	Write a short note on. a) Marketing Management and its function. b) Function & objectives of Advertising. c) Applications of Network Techniques.	15
	Section – B	
Q.6	Answer any two of the following. a) Discuss in detail the integrated Materials Management. b) What are the objectives of inventory control? c) Explain the benefits of TQM.	05 05 05
Q.7	a) Explain the importance & necessity of Labour Acts. b) Explain in detail the Factories Act.	08 07
Q.8	a) Discuss the importance of economics for Engineers. b) What is capital. Explain its types.	08 07
Q.9	a) Explain the functions of Bank. b) Describe the need for ISO Certification	08 07

Q.10 Write the short notes on

- a) Needs, objectives and functions of MIS.
- b) Distinguish the data Processing system & a MIS.

08

07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-475
FACULTY OF SCIENCE & TECHNOLOGY
B.E. (EEP/EEE/EE)
Elective-I: Flexible AC transmission System
(Revised)

[Time: Three Hours]

[Max. Marks:80]

- N.B Please check whether you have got the right question paper.
- i) Q. No.1 & Q.No.6 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 |
| | <ol style="list-style-type: none"> a) Mention the objectives of FACTS b) Why do we need FACTS c) Define SVC & SVG d) What is the best location of SVC. e) Define UPFC & IPFC f) What is necessity of compensation g) What are the basic types of FACTS controllers h) Write the difference between TSSC & TCSC | |
| Q.2 | <ol style="list-style-type: none"> a) Explain why we need transmission interconnection b) Explain the factors which limits the loading capability and relative importance of controllable parameters. | 07
08 |
| Q.3 | <ol style="list-style-type: none"> a) Explain the construction and working of I-\emptyset full wave bridge FACTS converter. b) Explain BESS & TCBR. | 07
08 |
| Q.4 | <ol style="list-style-type: none"> a) Explain end line voltage support to prevent voltage instability. b) Differentiate between STATCom and SVC | 07
08 |
| Q.5 | Write a short note on | |
| | <ol style="list-style-type: none"> a) basic types FACTS controllers b) Power flow in meshed system c) Power oscillation damping | 05
05
05 |

Section – B

- | | | |
|-----|--|----|
| Q.6 | Solve any five questions | 10 |
| | <ol style="list-style-type: none"> a) State salient features of UPFC b) What is Bang-Bang control c) What is IPFC d) What do you mean by load compensation e) How TCBR is used to improve the transient stability | |

- f) Define active and passive VAR control.
 - g) Write the advantages of TCVR's.
 - h) What are the different constraints for operating UPFC.
- Q.7
- a) Explain the functional control scheme for the SSSC 07
 - b) Explain the working of TCSC with a neat diagram and waveforms. 08
- Q.8
- a) Explain power flow control by phase angle regulators. 07
 - b) Explain thyristor tap changer with discrete level control. 08
- Q.9
- a) Explain the hybrid arrangement of UPFC with a phase shuffling transformer. 07
 - b) Explain the operation of TCBR. 08
- Q.10 Write a short note on
- a) GCSC 05
 - b) NGH-SSR 05
 - c) Hybrid phase angle regulator 05

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-492
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE)
Power System Dynamics and Stability
(Old)

[Time: Three Hours]

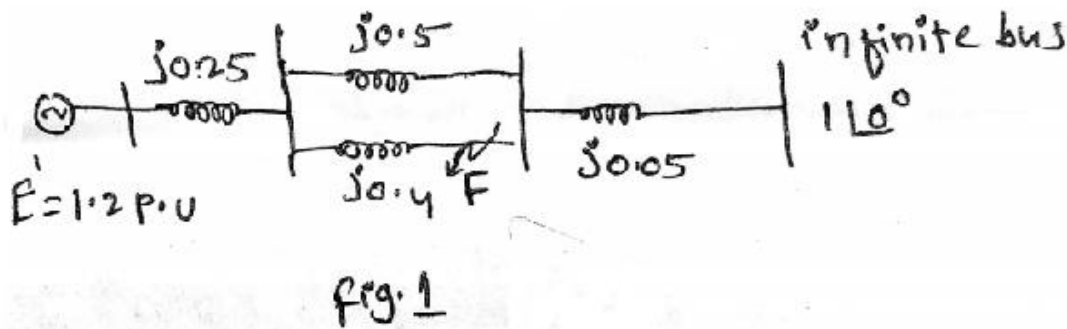
[Max.Marks: 100]

Please check whether you have got the right question paper.

- N.B
- 1) Attempt any three questions from each Section.
 - 2) Use suitable additional data if necessary.
 - 3) Draw neat labelled sketch wherever necessary.

Section A

- Q.1
- a) Explain the concept of steady state, transient and dynamic stability. 08
 - b) Derive power angle equation for synchronous machine. Plot the curve. Indicate stable operating region for synchronous motor as well generator and Justify this indication. 08
- Q.2
- a) Derive the expression for critical clearing angle in case short circuit away from line ends for a generator connected to infinite bus through a double circuit line. 08
 - b) Fig 1. Shows a radial power system where a 3- ϕ fault occurs in at point 'F'. Find the critical clearing angle. 08
- The generator may be assumed to deliver 1.0 p.u. power at the instant preceding the fault.



- Q.3
- a) Derive swing equation of multi machine system. 06
 - b) A 50 Hz generator is delivering 50% of the power that it is capable of delivering through a 10 transmission line to an infinite bus. A fault occurs that increase the reactance between the generator and the infinite bus to 500% of the value before the fault. When the fault is isolated the maximum power that can be delivered is 75% of the original maximum value. Determine the critical clearing angle for the condition described.
- Q.4
- a) Explain the factor affecting transient stability and methods adopted for improvements. 08
 - b) Explain the effect of type of fault and grounding on transient stability. 08

- Q.5 Write short notes on any three:- 18
- i) Power angle curve
 - ii) Modelling of synchronous machine
 - iii) Voltage regulator
 - iv) Damping and synchronizing torque analysis

Section B

- Q.6 a) Illustrate the construction of Clarke's diagram for determination of steady state stability limit for two machine system. 08
- b) A synchronous generator having internal reactance 0.6 p.u. connected to an infinite bus through a series reactance of 1.00 p.u. The terminal voltage of the generator is held at 1.2 p.u. and the voltage of the infinite bus at 1.00 p.u. Find the steady state stability. 08
- Q.7 a) Describe any two excitation system configurations. 08
- b) Discuss the role of voltage regulator. How build up and build down curve can be recorded. 08
- Q.8 a) Explain methods to improve stability. 06
- b) A generator at 60 Hz delivers 1 p.u. power to an infinite bus when the fault occurs which reduces the maximum power transferable to 0.4 p.u. Whereas the maximum power transferable before the fault was 1.75 p.u. and is 1.35 p.u. After the fault is cleared. Determine the clearing angle. If the inertia constant (H) of the generator is 4 p.u. determine whether the system will remain stable or not when the fault is cleared after 5 cycles. Use point-by-point method and time interval to be considered is 0.05 sec. 10
- Q.9 a) Explain supplementary modulation control of facts devices. 08
- b) Explain AVR and its role in improvement of system stability. 08
- Q.10 Write short notes on :- 18
- 1) Damping and synchronizing torque.
 - 2) Power system stabilizer.
 - 3) Facts devices.

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-497
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (EEP/EE/EEE)
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 & 6 are compulsory.
 2. Solve any 2 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) List & explain applications of ES in various areas.
 - b) Explain 3 – stage pipeline structure of ARM processor.
 - c) Explain Barrel shifter operations.
 - d) What do you mean by instructions set? Write down its significance.
- Q.2 08
- a) What are the design challenges in Es. Explain in detail.
 - b) Explain recent trends in Es. 07
- Q.3 07
- a) Explain the architecture of ARM processor in detail.
 - b) Explain different special purpose & general purpose registers available in ARM core. 08
- Q.4 08
- a) Discuss MSR, MRS and SWAP instruction in ARM core.
 - b) Explain in detail memory management within ARM core. 07
- Q.5 Write short note on 15
- a) Thumb Instruction Set
 - b) ARM core extensions
 - c) CAN Bus

Section B

- Q.6 Answer any two from following 10
- a) Explain in detail porting of RTOS.
 - b) Discuss in brief need of interfacing & interfacing technique.
 - c) Explain memory management in RTOS.
 - d) Explain features & uses of μ cos – II.
- Q.7 08
- a) Discuss the brief interfacing of input devices like LCD with ARM 7 based micro controller.
 - b) Explain in detail AT command for GSM modem. 07

- Q.8 a) What is semaphore? Explain the different types of semaphore. 08
- b) Explain in detail RTOS Kernel architecture. 07
- Q.9 a) Define RTOS & compare its services with traditional OS. 08
- b) Explain in detail µcos – II service functions. 07
- Q.10 Write short note on: 15
- a) Task state & task scheduling
- b) Inter task communication in µcos – II
- c) RTOS mailbox

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-500
FACULTY OF SCIENCE 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) Answer any three questions from each Section.
Section A
- Q.1 a) List out the features of 8086 microprocessor. 08
b) What is memory segmentation? List out its advantages. 08
- Q.2 a) Explain the following instructions. 08
i) AAA ii) LOCK iii) ESC iv) LOOP
b) Explain flag register of 8086 microprocessor. 08
- Q.3 a) Explain in detail minimum mode configuration of 8086 microprocessor. 08
b) Write an 8086 ALP to compute 08
- $$Z = \frac{(A + B) * C}{D}$$
- Q.4 a) Explain the synchronization between 8086 microprocessor & its co-processor. 08
b) Draw a neat interfacing diagram to interface 8 LEDs to 8086 microprocessor through 8255. Also write a program to blink the LEDs ON & OFF continuously. 08
- Q.5 Write notes on- 18
a) Addressing modes of 8086 microprocessor.
b) PROCEDURE & MACRO
c) Features of 8087.
- Section B
- Q.6 a) Give the comparison between microprocessor & microcontroller. 08
b) Explain PSW of 8051 microcontroller. 08
- Q.7 a) Write an 8051 ALP to determine two's complement of 16 bit number. 08
b) Explain the function of following instructions. 08
i) SWAP A ii) MUL AB
iii) DIV AB iv) DAA
- Q.8 a) Explain in brief general structure of Internal RAM of 8051 microcontroller. 08
b) Explain TCON & SCON control registers of 8051 microcontroller. 08

- Q.9 a) Draw an interfacing diagram to interface stepper motor to 8051 microcontroller & Write an ALP to rotate the stepper motor. 08
- b) Explain in brief interrupts of 8051 microcontroller. 08

- Q.10 Write notes on:- 18
 - a) Selection of microcontroller
 - b) LED interfacing
 - c) SFRs