**SUBJECT CODE NO:- K-16**
**FACULTY OF ENGINEERING AND TECHNOLOGY**
**B.E. (EEP/EE/EEE) Examination Oct/Nov 2016**
**High Voltage Engineering**
**(Revised)**

**[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) Solve any two questions from remaining in section 'A'.
            iii) Solve any two questions from remaining in section 'B'.

**Section A**

Q.1     Answer in two/three sentences, <u>any five</u>.                                                         10
        a)  Define "Di-electric"?
        b)  Define "Electric stress"?
        c)  Define "Surge voltages"?
        d)  Write "Paschen's voltage"?
        e)  Define ImpulseVoltage?
        f)  Define the meaning of "Break Down"?

Q.2     a)  What are numerical methods for electric filed computations? Explain any one.            08
        b)  Explain how will you control surge voltages?                                            07

Q.3     a)  Explain intrinsic break down with neat sketches.                                        08
        b)  Explain reasons & way of break downs, in composite di-electrics.                        07

Q.4     a)  Explain any one method of generation of high alternating voltages?                      08
        b)  Explain any one method of tripping of impulse generators.                               07

Q.5     a)  Describe any one method to measure thermal break down.                                  08
        b)  Explain the meaning & construction method of composite di-electric.                     07

**Section B**

Q.6     Answer in two/three lines. Any five.                                                        10
        a)  Define "Direct impulse"?
        b)  Define "Alternating impulse"?
        c)  Define "Switching Surges"?
        d)  Define "D.C. Resistivity"?
        e)  State meaning of radio interference.
        f)  Define, "Partial Discharge"?

Q.7     a)  Discuss any one method of measurement of impulse voltages.                              07
        b)  Explain working of "Abraham voltmeter" for measurement of high voltages, with neat sketches.    08

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Q.8    a)  Explain with sketches, in details, the "Lightning Phenomenon".                              08
       b)  What are the principles of insulation co-ordination "on H. V. & H.V systems?"                07

Q.9    a)  Explain any one method of partial discharge measurements.                                    07
       b)  Explain the necessicity of double frequency-double voltage measurement?                      08

Q.10   a)  Write short note on "Testing of surge arresters"?                                            07
       b)  Explain working of oscilloscope for impulse measurements, with neat sketches.                08

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**SUBJECT CODE NO:- K-45**
**FACULTY OF ENGINEERING AND TECHNOLOGY**
**B.E. (EEP/EE/EEE) Examination Oct/Nov 2016**
**Power System Operation & Control**
**(Revised)**

**[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.    Solve any five sub questions from Q.no.1 and Q.no.6.
      III.   Solve any two questions from remaining questions in each section.
      IV.   Assume suitable data wherever necessary .

## Section A

Q.1    Solve any five questions.                            10
        a)   Draw wave form of spatial mmf wave in air gap.
        b)   What is infinite bus bar?
        c)   Write two effects of excitation system.
        d)   What is static excitation system?
        e)   Define small signal stability.
        f)   Draw the sub transient model of synchronous machine.
        g)   What is an exciter?

Q.2    a)   Explain AC excitation system in details.            08
        b)   Write the functions of AC and DC regulators in excitation system.        07

Q.3    a)   Derive the expression for swing equation.            08
        b)   Explain the classical transfer function of hydraulic turbine and its speed characteristics.    07

Q.4    a)   Explain with block diagram the governor with transient drop compensation.    08
        b)   Explain stator voltage equation and rotor flux linkage equations in terms of dq0components.    07

Q.5    Write short note on.                         15
        a)   Parks transformation
        b)   Automatic voltage regulator.
        c)   Classification of stability.

## Section B

Q.6    Solve any five questions.                          10

        a)   What is economic load dispatch?
        b)   State how a transmission line generator absorbs reactive power.
        c)   What is energy management system?
        d)   What is AGC?
        e)   What is the function of tap changing transformers?
        f)   What are the merits of synchronous compensator?
        g)   What is contingency analysis?

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Q.7  a)  Explain any four methods of voltage control in detail.                                          08
     b)  Explain various function of SCADA with neat diagram.                                            07

Q.8  a)  Explain long term hydrothermal scheduling problem formulation.                                  08
     b)  Explain power system security assessment in detail.                                             07

Q.9  a)  Enumerate the operating states and control strategies of a power system.                        08
     b)  Derive the expression for economic load dispatch problem formulation.                           07

Q.10     Write short notes on.
         a)  Distribution system voltage regulation.                                                     05
         b)  Static VAR Compensator.                                                                     05
         c)  Maintenance scheduling.                                                                     05

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**SUBJECT CODE NO:- K-77**
**FACULTY OF ENGINEERING AND TECHNOLOGY**
**B.E. (EEP/EE/EEE) Examination Oct/Nov 2016**
**Renewable Energy**
**(Revised)**

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

Please check whether you have got the right question paper.
N.B          i) Use suitable data if required.
              ii) Question no1 from section A and Question no6 from section B are compulsory.
              iii) Solve any two questions from remaining questions from each section A and B.

**Section A**

Q.1    Solve any five from the following.                                                                 10
       a)   Define solar energy.
       b)   What is meant by pitch angle?
       c)   What is a solar pond?
       d)   Define a fuel cell.
       e)   What are the conventional sources of energy?
       f)   Define the PV effect.
       g)   What are wind farms?
       h)   List four advantage of wind power.

Q.2    a)   What are the essential features for site selection of wind farm?              08
       b)   With neat diagram explain how wind energy can be converted into electrical energy.    07

Q.3    a)   Explain the merits and limitations of wind energy.                                08
       b)   Explain the main applications of wind energy.                                      07

Q.4    a)   What are the advantages of renewable energy sources?                          08
       b)   Write short note on solar cells.                                                       07

Q.5    a)   Write short note on solar arrays.                                                     08
       b)   Draw the sketch of vertical axis wind machine and label its parts.              07

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**Section B**

Q.6 Solve any five from the following.     10
    a) Differentiate between Biogas and Biomass.
    b) Write the geothermal sources. (any two)
    c) What is meant by direct energy conversion?
    d) What is Joule Thomson effect?
    e) Write the various fuel cells.
    f) What is meant by pyrolysis?
    g) What is the need of digester in Biomass conversion?
    h) What is pyrolysis?

Q.7   a) Explain the working of a thermo electric generator.     08
    b) What is MHD generator? Explain its working principle.     07

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) What are the classifications of geothermal sources?     07

Q.10   a) Explain the applications of geothermal energy.     08
    b) What are the main applications of the gasifier?     07

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**SUBJECT CODE NO:- K-132**
**FACULTY OF ENGINEERING AND TECHNOLOGY**
**B.E.(EEP/EE/EEE) Examination Oct/Nov 2016**
**Electrical Power Quality [Elective-II]**
**(Revised)**

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

Please check whether you have got the right question paper.

N.B          i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
             ii) Solve any two questions from the remaining questions in each Section A and B.

## Section A

Q.1     Solve any five                                                                                          10
        (a)  What is the need of locating harmonic sources
        (b)  Differentiate between linear loads and non-linear loads
        (c)  What are various causes of overvoltage's
        (d)  Define transient  overvoltage's
        (e)  What is voltage sag
        (f)  What is estimating sag performance
        (g)  What are power Quality issues
        (h)  Define power Quality

Q.2     (a)  Explain the impact of power Quality.                                                             08
        (b)  Explain the various types of power quality disturbances.                                         07

Q.3     (a)  Discuss the sources of sags and interruption.                                                    08
        (b)  Explain the sag performance evaluation methods.                                                 07

Q.4     (a)  Explain the different Compensation schemes to mitigate voltage sags.                             08
        (b)  What is the need for protection against overvoltage's for various equipment's.                   07

Q.5     (a)  What are the general cause of harmonics in power system?                                         08
        (b)  What are the two important harmonic indices used in power system. Explain any one.               07

## Section – B

Q.6     Solve any five                                                                                          10
        (a)  What is the importance of power Quality monitoring
        (b)  What is monitoring objectives
        (c)  What are the purpose of power quality monitoring system
        (d)  What are the characteristics of power line monitors
        (e)  Define reliability indices
        (f)  Write two reasons of Grounding
        (g)  Write the reasons of degradation of reliability
        (h)  Write the function of Oscilloscope

Q.7     (a)  Discuss in detail about the selection of power quality monitoring sites.                         08
        (b)  Discuss in detail about the flicker meter.                                                       07

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Q.8 (a) What are the various devices for controlling harmonic distortion explain any one. 08
(b) Write the advantages and disadvantages of power quality monitoring. 07

Q.9 (a) Write short note on reliability in power quality. 08
(b) What do you understand by security and relaying in power quality reliability? 07

Q.10 (a) What are the typical wiring and grounding problems? 08
(b) Write the solutions to grounding problems in detail. 07

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SUBJECT CODE NO:- K-190
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E.(EEP/EEE/EE) Examination Oct/Nov 2016
Electric Drives
(Revised)

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

Please check whether you have got the right question paper.

N.B
i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
ii) Attempt any two questions from Q. No. 2 to Q. No. 5 and Q. No. 7 to Q. No. 10
iii) Assume suitable data where necessary.

## Section A

Q.1    Attempt any FIVE.                                                                                       10
   a) What are the advantages of electrical drives?
   b) What is meant by load equalization?
   c) State essential parts of electrical drives.
   d) What are the functions of power modulator?
   e) What are choices of electrical drives?
   f) What do you mean by constant- torque?

Q.2    a) Prove that torque developed by the motor is given by.                                     07
   $T = T_L + j\frac{dwm}{dt} + W_m\frac{dj}{df}$

   b) A drive has following parameters.                                                            08
   J=10kg-m$^2$ ,   T=100-0.1N, N-M ,
   Passive load torque, T$_l$ =0.05N, N-M, Where 'N' is the speed in rpm.
   Initially the drive is operating in steady state, Now it is to be reversed ,for this motor characteristic
   is changed to T-100-0.1N N-m, calculate the time of reversal.

Q.3    a) A fully controlled rectifier is feeding a separately excited motor driving a friction load. Motor is     07
   operating in steady state with a rectifier firing angle of 30°, firing angle is now changed from 30° to
   60°. Explain how the motor current and speed will change with time. Draw relevant waveform.

   b) Derive the expression to find the equivalent load torque and equivalent inertia of loads in          08
   translational and rotational motion.

Q.4    a) Describe how the speed of a separately excited d.c motor is controlled through the use of two       08
   3-phase full converters. Discuss how two quadrant drives can be obtained from this scheme.

   b) A- 200volts, 875 rpm, 150A separately excited DC motor has an armature resistance of 0.06Ω .If is     07
   fed from a single phase fully controlled rectifier with an ac source of 220 volts, 50Hz, Assuming
   continuous conduction. Calculate.
   1)  Firing angle for rated torque and 750rpm.
   2)  Motor speed for ∝= 160 degrees and rated torque.

Q.5    Write short notes on following.                                                                        15
   a) Recent trends in D.C drive control.
   b) Chopper for DC drives.
   c) Industrial applications of d.c motor.

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## Section B

Q.6    Attempt any five.        10
- a) What are the advantages of squirrel cage induction motor over d c motors?
- b) What is single phasing? Why should it be avoided?
- c) What is meant by soft start?
- d) What are the disadvantages of induction motor operation with unbalanced supply voltages?
- e) What do you meant by self-control mode in synchronous motor?
- f) Mention the special features of BLDC motor.

Q.7
- a) Derive an equivalent circuit and torque expression for a delta connected induction motor when one supply phase is disconnected.    08
- b) 3KW, 400V, 50H$_z$, 4 pole, 1370 rpm, delta connected squirrel cage induction motor has the following parameters. Referred to stator.    07

  $R_s=2\Omega$, $\; X_s = x'_0 = 5\,\Omega$, $, X_m = 90\,\Omega$ , $R'_0 = 5\,\Omega$

  Motor speed is controlled by stator voltage control. When driving a fan load it runs at rated speed at rated voltage. Calculate.
  1) Motor terminal voltage, current and torque at 1200rpm.

Q.8
- a) A-3 phase, 5KW, 440v, 50Hz, 4 pole Y connected synchronous motor has stator winding,resistance of 0.2 $\Omega$, synchronous reactance of 8 $\Omega$ and a Rated field current of 1A. When operating at full load the power factor is unity.    08
  1) Calculate the torque angle when operating at full load.
  2) Pull-out torque and power.
  3) Power factor, armature current and efficiency at half the rated torque.
  4) Field current. to get unity power factor at half the rated torque.
- b) Explain with relevant circuit diagram both types of static scherbius drives for obtaining speeds below as well as above synchronous speed.    07

Q.9
- a) Explain the operation of current source inverter fed induction motor Drive.    07
- b) Explain in detail, why the load commutated inverter fed Synchronous motor drive is found suitable for high power applications.    08

Q.10   Write short note on the following.    15
- a) DWM controlled induction motor drive.
- b) Advantages of BLDC over conventional D.C Motor.
- c) Synchronous motor drive.

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SUBJECT CODE NO:- K-346
**FACULTY OF ENGINEERING AND TECHNOLOGY**
**B.E.(EEE/EEP/EE) Examination Oct/Nov 2016**
**Elective-I: Flexible AC Transmission System**
**(Revised)**

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

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

## Section A

Q.1   Solve any five.                                                                                    10
    a) What are conventional methods used for compensation in power system?
    b) What are objectives of line compensation?
    c) How is reactive power controlled in electrical network?
    d) List the disadvantages of fired series compensation.
    e) What are main areas of application of facts devices?
    f) What is the best location for SVC?
    g) What are the general characteristics of SVCs?
    h) What are different types of losses in STATCOM?

Q.2   a) Explain the basic types of facts controllers.                                    08
      b) Explain the midpoint voltages Regulation for line segmentation tea shunt compensation.   07

Q.3   a) Explain the construction & working of $3\phi$. Full wave type converter.     08
      b) Explain construction & working of FC-TCR.                                      07

Q.4   a) Explain the working of TSC with diagram & waveform.                           08
      b) Explain the application of STATCOM.                                            07

Q.5   a) Explain static var system.                                                     08
      b) Explain the power flow in parallel and meshed system.                          07

## Section – B

Q.6   Solve any five.                                                                    10
    a) What is IPFC?
    b) What are different constraints for operating UPFC?
    c) What are applications of SVC?
    d) What is meant by line compensation?
    e) What is use Breaking resistor?
    f) What are advantages of TC VRs?
    g) Define active and passive VAR control.
    h) State the salient features of UPFC.

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Q.7    a)   Explain GCSC with neat diagram and waveform.   08
        b)   With the help of power angle curve explain how transient stability is improved with series controllers.   07

Q.8    a)   What are the basic operation principles of IPFC?   08
        b)   Explain thyristor controlled braking resistor.   07

Q.9    a)   Explain variable reactance model of TCSC with neat diagram.   08
        b)   Explain the hybrid phase angle Regulator.   07

Q.10   a)   Explain switching converter based voltage phase angle regulator.   08
        b)   Explain UPFC back to back voltage source converter.   07

**SUBJECT CODE NO:- K-347**
**FACULTY OF ENGINEERING AND TECHNOLOGY**
**B.E.(EEE/EEP/EE) Examination Oct/Nov 2016**
**Elective-I: Power Electronics -II**
**(Revised)**

**[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) Solve any two questions from the remaining questions from each section.
             iii) Use suitable data if required.

## Section A

Q.1    Write the following questions.                                                                          10
       i)      What is the cause of reverse recovery time in pn junction diode?
       ii)     What are the differences in gating characteristics of GTO & thyristor?
       iii)    What are the effects of removing freewheeling diode in single phase semi converters?
       iv)     Does the input power factor of converter depend on the load power factor?
       v)      What are the purposes of feedback diodes in inverters?

Q.2    a)    Explain the two quadrant operation of single phase fully controlled converter.              08
       b)    A single phase semi convertor is operated from 220V, 50HZ. The load current with average value of $I_a$   07
             is continuous with negligible ripple content. If the delay angle is $\propto = \frac{\pi}{3}$ calculate i)  Harmonie factor of
             input current          ii)   Input power factor.

Q.3    a)    State the techniques used to improve input power factor for ac-dc converter. Explain with neat       07
             waveform the extinction angle control principle.
       b)    What is sinusoidal PWM control of a convertor? How the output voltage of a sinusoidal PWM           08
             convertor is controlled?

Q.4    a)    State and explain the performance parameters of inverter.                                    07
       b)    With neat waveforms explain how the gating signals for single phase full bridge invertors generated   08
             using sinusoidal PWM?

Q.5    Write short notes:-                                                                               08
       i)      Twelve pulse converter concept & its advantages.                                          07
       ii)     Modified sinusoidal PWM invertors control.

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## Section – B

Q.6 Write the following questions. 10
- i) What is multilevel inventor?
- ii) What are the major advantages if diode damped multilevel invertor?
- iii) What is mean by capacitor voltage unbalancing in multilevel invertor?
- iv) What is zero current switching principle in resonant convertor?
- v) Draw the switch configurations for ZVS resonant converters.

Q.7
- a) State the disadvantages of PWM controlled converters. How they are minimized in resonant pulse - convertor? 08
- b) Explain with neat circuit & waveform the operating principle of series resonant inverters? 07

Q.8
- a) What is class E resonant inverter? Explain with neat circuit & waveform the operating principle of E resonant inverters. 08
- b) What are the normal specifications of power supplies? Name three types of dc power supplies. 07

Q.9
- a) With neat circuit & waveform explain the operating principle of fly back convertor. 08
- b) The average output voltage of the push pull circuit is $V_0 = 24V$ at resistive load of $R = 0.4$ ohm. The on state voltage drops of transistors & diodes are $V_t = 1.2\,V$ & $V_d = 0.7\,V$ respectively. The transformer turns ratio is a $\frac{Ns}{Np} = 0.5$ determine. 07
  - i) Average input current I$_s$.
  - ii) Efficiency ($\eta$)
    Neglect the losses in transformer and the ripple current in the load & supply is negligible.

Q.10 Write short notes.
- i) Voltage mode control principle. 07
- ii) Cascaded multilevel inverter. 08

2016

**SUBJECT CODE NO:- K-366**
**FACULTY OF ENGINEERING AND TECHNOLOGY**
**B.E.(EEE/EEP/EE) Examination Oct/Nov 2016**
**Elective-I: Recent Trends in Power Systems**
**(Revised)**

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

Please check whether you have got the right question paper.

N.B          i) Q.No.1 and Q.6 are compulsory.
            ii) Solve any two questions from section A and B excluding compulsory questions.
            iii) Assume suitable data.

**Section A**

Q.1    Solve the following questions (any five)                                                        10
       a)   Define Smart Grid.
       b)   Write some functions of Smart Grid.
       c)   What are the advantages of Smart Grid (any four)
       d)   Draw a Conventional Smart grid.
       e)   What are the disadvantages of smart meter?
       f)   How feeder losses are automated in feeder automation.
       g)   What information the GIS system translates?
       h)   How is the smart storage of battery done?

Q.2    a)   What is the state and trends of Substation Automation?                                     08
       b)   What is the substation Automation solution?                                                07

Q.3    a)   How is online stability assessment algorithm performed continuously in WAMS?              08
       b)   Explain and Draw simplified representation of WAMS?                                        07

Q.4    a)   Explain the home and building Automation.                                                  08
       b)   Explain the phase measurement unit.                                                        07

Q.5    a)   Write short notes on IED.                                                                  08
       b)   Explain OMS.                                                                               07

**Section B**

Q.6    Solve  the following questions (any five)                                                       10
       a)   How sizing affects the economics of PV cell.
       b)   Draw a PV cell.
       c)   Draw the diagram representating the components of micro grid.
       d)   What are the advantages of micro grid?
       e)   Why are energy storage systems essential? (Any four point)
       f)   Draw a hybrid filter with neat diagram.
       g)   What is meant by peak power operation in solar cells?
       h)   Define micro grid.

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| Q.7 | a) | Explain building integrated PV system. | 08 |
| | b) | Write short note on micro turbine. | 07 |
| | | | |
| Q.8 | a) | What are the issues of inter connection of micro grid? | 08 |
| | b) | Explain the captive power plant. | 07 |
| | | | |
| Q.9 | a) | What are the applications of micro grid? | 08 |
| | b) | What are the components of integrated PV system? Explain. | 07 |
| | | | |
| Q.10 | a) | Write short note on Shunt filters. | 08 |
| | b) | Write short note on solar cells. | 07 |

2016

# Subject Code : 124
## FACULTY OF ENGINEERING & TECHNOLOGY
### B.E. (CSE) (Revised) Examination
### NOVEMBER/DECEMBER, 2016
### (Elective – II)
# Remote Sensing & Geographical Information Systems

Time: Three Hours

Max. Marks : 80

**"Please check whether you have got the right the question paper"**

Note: i) *Assume suitable data if necessary.*
ii) *Figures to the right indicate full maks.*
iii) *Q.No. 1 and Q.No. 6 are compulsory. Solve any two questions from each section.*

## SECTION – A

Q.1 (a) What is remote sensing? Explain its principles. 05
  (b) Explain (i) Electromagnetic spectrum 05
    (ii) Thermal emission of radiation.

Q.2 (a) Explain (i) Human vision colours 08
    (ii) Thermal emission of radiation.

  (b) What is a sensor? What are passive and active sensors? Explain. 07
Q.3 (a) What are the errors in the imaging process? 08
  (b) Explain elements of image interpretation. 07
Q.4 (a) Discuss various properties of digital remote sensing data. 07
  (b) Explain the concept of word file with suitable examples. 08
Q.5 Write short note on the following : 5x3=15
  (a) Nearest neighbour
  (b) Geo-referencing
  (c) Remote sensing systems.

## SECTION – B

Q.6 What is remote sensing image processing? Explain image classification techniques. 10
Q.7 (a) Define GIS. Explain its elements. 08

  (b) Explain the need and applications of GIS. 07
Q.8 (a) Explain Raster and vector data models in GIS. 08
  (b) Explain (i) Aexial photographs 07
    (ii) web GIS.
Q.9 (a) Explain the importance of data analysis in GIS. 07
  (b) Explain (i) Data exploration 08
    (ii) Cartography
Q.10 Write short note on the following : 5x3=15
  (a) Integration of satellite images
  (b) Superused and unsuperused techniques
  (c) Mapping and analysis.

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# K – 2016
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# Subject Code : 136

## FACULTY OF ENGINEERING & TECHNOLOGY
### B.E. (EE/EEE) (Revised) Examination
### NOVEMBER/DECEMBER, 2016
## Control System - II

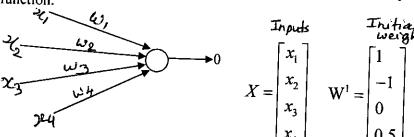Time: Three Hours                                    Max. Marks : 80

**"Please check whether you have got the right the question paper"**

Note:  i)   *Attempt any three questions from each section.*
       ii)  *Q.No. 1 and Q.No. 6 are compulsory.*
       iii) *Solve any TWO from remaining questions from each section.*

### SECTION – A

Q.1   Solve any five.                                                    2 x 5 = 10

   (a)   Define state and state equation for a system.

   (b)   Write the properties of state transition Matrix.

   (c)   List out advantages of Digital control system.

   (d)   Compare Analog and Digital control system.

   (e)   What is meant by diagonalization?

   (f)   What are the merits and demerits of sampled data control systems?

   (g)   Define
      (i)    Eigen Values
      (ii)   Eigen Vectors
      (iii)  State of a system.

Q.2   Find the state transition matrix for a system whose state matrix is given by                 **15**

$$A = \begin{bmatrix} -5 & -1 \\ 3 & -1 \end{bmatrix} \text{ using}$$

   1) Caylay Hamilton method.
   2) Laplace Transform method.

Q.3   (a)   Obtain Eigen value, Eigen vector and model Matrix for the Matrix.                      **08**

$$A = \begin{bmatrix} 4 & 0 & 0 \\ -2 & 1 & 0 \\ 5 & 3 & 4 \end{bmatrix}$$

   (b)   What is the effect of pole placement by state feedback?                          **07**

Q.4   (a)   Write the Ackerman's formula to find the state observer gain Matrix. G                **08**

   (b)   What is the need for state observer.                                          **07**

Q.5   Write short note on the following :                                              **5x3=15**

   (a)   Power series method.

   (b)   Necessary and sufficient conditions for arbitrary pole placement.

   (c)   State Regulator Design.

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## K – 2016

# Subject Code : 136

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## SECTION – B

**Q.6** Answer any FIVE      **2x5=10**

(a) Write any two properties of non Linear System?

(b) What are Linear and nonlinear systems? Give examples.

(c) What are Limit cycle?

(d) What is phase plane?

(e) Define Lyapunov stability?

(f) What is fuzzy relation?

(g) Define Learning. What are the different types of Learning?

**Q.7.** (a) Explain saturation and back-Lash non linenty with necessary diagram.    **07**

(c) Explain Lyapunov's Direct Method.    **08**

**Q.8** a) Update the weights of neural network shown in figure using Hebbian Learning rule with the initial weight vector.    **15**

$$W_1 = \begin{bmatrix} 1 \\ -1 \\ 0 \\ 0.5 \end{bmatrix}$$

needs to be trained using set of three input vectors as below

$$X_1 = \begin{bmatrix} 1 \\ -2 \\ 1.5 \\ 0 \end{bmatrix} \quad X_2 = \begin{bmatrix} 1 \\ -0.5 \\ -2 \\ -1.5 \end{bmatrix} \quad X_3 = \begin{bmatrix} 0 \\ 1 \\ -1 \\ 1.5 \end{bmatrix}$$

for an arbitrary choice of learning constant C=1, use bipolar binary activation function.



$$X = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} \quad W^1 = \begin{bmatrix} 1 \\ -1 \\ 0 \\ 0.5 \end{bmatrix}$$

**Q.9** a) For given fuzzy set    **07**

$$\tilde{A} = \left\{ \left(\frac{1.9}{2}\right) + \left(\frac{1.5}{3}\right) + \left(\frac{0.9}{4}\right) + \left(\frac{1.2}{5}\right) \right\}$$

$$\tilde{B} = \left\{ \left(\frac{1.5}{2}\right) + \left(\frac{1.2}{3}\right) + \left(\frac{0.2}{4}\right) + \left(\frac{1.4}{5}\right) \right\}$$

Calculate the several operation of the fuzzy set.

b) Explain Min-Max Method of implication with a suitable example?    **08**

**Q.10** Write short note on:    **15**

a) Jump resonance

b) Fuzzy set Theory and operation.

c) Different types of activation function.

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**K – 2016**      3EE179D0A10555E2317EBFF55B0B6DAC

**SUBJECT CODE NO:- K-223**
**FACULTY OF ENGINEERING AND TECHNOLOGY**
**B.E.(EEP/EE/EEE) Examination Oct/Nov 2016**
**Power System Protection**
**(Revised)**

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

Please check whether you have got the right question paper.

N.B
    i) Q.1 and Q.6 are compulsory.
    ii) Solve any two questions from section A & B excluding compulsory question.
    iii) Assume suitable data.

### Section A

| | | |
|---|---|---|
| Q.1 | Attempt any five | 10 |
| | a) What is relay? | |
| | b) What is IDMT relay? | |
| | c) What is difference between static and analog type of relay? | |
| | d) What is function of CT & PT? | |
| | e) What is the function of Buchholz relay? | |
| | f) Compare the static & electro- magnetic relay. | |
| | g) What is reverse phase sequence relay? | |
| | | |
| Q.2 | a) Explain drawback of over current relay on EHV transmission line. | 08 |
| | b) Write down three stepped distance protection scheme. | 07 |
| | | |
| Q.3 | a) Explain construction and working of electromagnetic relay. | 08 |
| | b) Explain working characteristics and application of differential relay. | 07 |
| | | |
| Q.4 | a) Write down effect of fault on alternator along with their protection. | 08 |
| | b) Write down protection for prime mover failure over voltage rotor fault. | 07 |
| | | |
| Q.5 | a) Write not on earth fault protection for delta side and star side of delta star transformer. | 08 |
| | b) Describe use of Buchholz relay for transformer protection. | 07 |

### Section B

| | | |
|---|---|---|
| Q.6 | Attempt any five | 10 |
| | a) Write the application of CB. | |
| | b) What is the rating of CB? | |
| | c) What is Peterson coil? What protective functions are performed by this drive? | |
| | d) Give the advantages of air blast CB. | |
| | e) Give the advantage of minimum oil CB. | |
| | f) Write classification of CB. | |
| | g) Explain Restriking voltage. | |
| | | |
| Q.7 | a) Describe the protection for single phasing fault in induction motor. | 08 |
| | b) Explain merz-price protection for transformer. | 07 |

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Q.8    a) Write down properties of different distance relay for normal load flow condition.    08
       b) Write down three stepped distance protection scheme.    07

Q.9    a) What are different causes of over voltages in power system?    08
       b) Define direct stroke & travelling waves. How will you protect transmission line from direct stroke?    07

Q.10    Write short notes on any three    15
       a) Vaccum circuit breaker
       b) Air break circuit breaker
       c) Microprocessor based over current relay
       d) MCB
       e) Resistive switching.

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**SUBJECT CODE NO:- K-254**
**FACULTY OF ENGINEERING AND TECHNOLOGY**
**B.E.(EEE/EEP/EE) Examination Oct/Nov 2016**
**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 question of section A
        ii) Solve any three questions from section B.
        iii) Assume suitable data wherever necessary.

**Section A**

Q.1     Solve:-
        a) Define ROC. of infinite causal signal.        02
        b) What is signal & signal processing?        02
        c) Define Z-transform of $\delta(n)$        02
        d) What will be $x(4\text{-}n)$ if $x(n)=\{1,2,3,4,5,6,7\}$        02

        e) Give the advantages of DSP over ASP.        03
        f) Explain the concept of aliasing.        03

Q.2     a) Define the following signals with suitable example.        06
          1) Multichannel/ Multi-dimensional.
          2) Continuous time / discrete time signal.
          3) Continuous value / discrete value signal.
     b) Draw the block –diagram of digital signal processing and explain the function of each block.        07

Q.3     a) State and prove the properties of discrete time signals.        07
     b) Using basic building blocks sketch the block diagram representation of the discrete time system        06
        described by input-output relation
$$Y(n) = \frac{1}{4}y(n\text{-}1) + \frac{1}{2}x(n) + \frac{1}{2}x(n-1).$$

Q.4     a) Determine the z-transform and sketch ROC of. Of the following signal.        06
$$x(n) = \propto^n u(n) + b^n u(-n-1)$$
        07
     b) State and explain in brief properties of z-transform.

Q.5     Write short note on (any two)
        1) Classification of discrete time systems.        06
        2) Correlation between S-plane of z-plane.        06
        3) Prove FD [TD (x(n))] $\neq TD\left[FD\left(x(n)\right)\right]$ $where\ FD\ \&\ TD$ is folding & time delay operation.        07

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**Section-B**

Q.6    a)   Determine convolution sum of two sequences         07

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

       b)   State and explain the properties of convolution.        06

Q.7    a)   Determine. 8-pt DFT of the sequence        07

          X(n= {1,1,1,1,1,1,0,0}

       b)   Find IDFT of the sequence.        06

          X(k)={5,0,1-j,0,1,0,1+j,0}

Q.8    a)   Perform circular. Convolution of following sequences.        07

          $x_1(n) = \{1,2,3,1\}, x_2(n) = \{4,3,2,2\}$

       b)   Give relationship between discrete Fourier transform and z- transform.        06

Q.9    a)   Draw cascade realization of FIR filter system        06

       b)   Obtain the direct form- I realization for the system, described by the following difference equation: 07

          y(n)=0.5y(n-1)-0.25y(n-2)+x(n)+0.4x(n-1)

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

       1)   Properties of DFT        07

       2)   Signal Flow graph        07

       3)   Lattice structures.        06

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**SUBJECT CODE NO:- K-286**
**FACULTY OF ENGINEERING AND TECHNOLOGY**
**B.E.(EEP/EEE/EE) Examination Oct/Nov 2016**
**Industrial Automation**
**(Revised)**

[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.    Solve any two questions from remaining questions in section A & B.
    III.    Figures to the right indicate full marks.
    IV.    Assume suitable data, if necessary.

Section A

Q.1    Solve <u>any two</u>.    10
    i)    Write the advantages & disadvantages of automation.
    ii)    What are the types of automation? Explain concept of hierarchy of automation.
    iii)    Draw ladder diagram using switches, relays and coils.
    iv)    Explain role of controller in automation.

Q.2    a)    How sequential logic control is achieved? Draw & explain its control system.    08
    b)    Draw & explain electrical & mechanical actuators?    07

Q.3    a)    What are the buses linked to PLC? Draw and explain.    07
    b)    What are the levels of automation? Compare manually operated and fully automatic level.    08

Q.4    a)    What are the discrete and continuous process variables? Draw their nature over a period compare    08
    between them.
    b)    What are the conventions, symbols adopted in drawing the ladder diagram? Draw and explain the    07
    ladder diagram for AC motor starter.

Q.5    a)    What are the technologies used for automation? Explain any one in detail.    08
    b)    How automation is applied to control the level of water in any tank system? Draw & explain its    07
    control system.

**Section-B**

Q.6    Solve <u>any two</u>:-    10
    1)    Explain the function of alarm handling and trending. Access control, logging report generation in
    SCADA.
    2)    What are the operational interfaces? Explain any one in detail.
    3)    Which are the data variables acquired in automatic substation control? How?
    4)    Non difference between centralized and distributed control system.

Q.7    a)    What is the function of data collection equipment? Draw & explain data logger.    08
    b)    What is the role of RTU & MTU? Draw their function block dia. & explain working of RTU & MTU.    07

Q.8    a)    Draw & explain SCADA hardware architecture.    08
    b)    How the SCADA system is implemented in conventional power generation? Explain.    07

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Q.9      a)  How input- output hardware is implemented in a DCS?    08

                b)  What are the types of displays used in DCS? Explain.    07

Q.10      a)  What are the types of communication technologies in DCS? Explain.    08

                b)  How automatic substation control is implemented using SCADA system? Explain.    07