

SUBJECT CODE NO:- E-9
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(EEP/EE/EEE) Examination Nov/Dec 2017
Electrical Machine Design
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

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

- N.B
- i. Q.1 and Q.6 are compulsory
 - ii. Attempt any two questions from Q.2 to Q.5
 - iii. Attempt any two questions from Q.6 to Q.10
 - iv. Assume suitable data wherever necessary

Section A

- Q.1 Attempt any five 10
- i) What do you mean by design & electrical machines
 - ii) Enlist the different design circuits
 - iii) Define specific magnetic loading & specific electric loading
 - iv) State the advantages of semi open slots used in Induction motor.
 - v) What is the significance of carters coefficient
 - vi) Why rotor conductors of sq. cage rotor are not provided with insulation
 - vii) What do you mean by magnetic leakage in fringing in rotating machine
 - viii) What do you mean by rating of rotating machine?
- Q.2 a) Define the expression for gap contraction factor for slot and gap contraction factor for ventilating ducts 07
- b) Determine the mmf required for the air gap of d. c. machines having open slots 08
- Given the following particulars
- Slot pitch=4.3cm
- Slot opening=2.1cm
- Gross core length=48cm
- Pole arc=18cm
- Air gap length=0.6cm
- Flux/pole=0.056 weber
- There are 8 ventilating ducts each 1.2cm wide
- Carters coefficient for slot=0.41
- Carters coefficient for duct =0.28
- Q.3 a) Deduce the output equation of 3 phase induction motor in terms of its specific loading. Also indicate the significance of terms involved 07
- b) In the design of 30 H.P, 440v, 960rpm 50Hz, delta connected induction motor assume the specific electric loading. 25000 ac/m, specific magnetic loading of 0.46 wb/m² full load efficiency 86%, power factor 0.87.estimate the main dimensions of stator 08
- Q.4 a) Explain the various factors to be considered for proper choice of rotor slots of induction motor 07
- b) Find the current in the bar and end ring of a case rotor of 6-pole, 3-ph, induction motor having 72 stator slots with 15 conductors in each slot. If the stator current is 20A. and rotor slots are 55. Find the suitable size of cage bar and end ring. 08

- Q.5 Attempt any three 15
- Modern trend in electrical machine design
 - Standardization and specifications in rotating machine
 - Selection of air gap length in rotating machine
 - Estimation of leakage reactance in induction motor
 - Choice of specific loadings in Induction motor

Section B

- Q.6 Attempt any five 10
- What are the different modes of heat dissipation in electrical machines
 - Define heating and cooling time constant
 - Define heating and cooling cycle of transformer
 - What are the causes of temperature rise in transformer
 - Enlist the type of windings used in transformer
 - What is the function of yoke in transformer
 - What do you mean by stacking factor
 - What type of mechanical force developed in transformer winding

- Q.7 07
- Derive the output equation of 3-phase transformer 08
 - A 3-phase 50Hz, oil cooled core type transformer has the following dimensions
 - Distance between core centers=0.2 m
 - Height of window=0.24 m
 - Diameter of circumscribing circle=0.14m
 - Flux density in the core=1.25 wb/m²
 - Current density in the conductor=2.5A/mm²
 Estimate the KVA rating of transformer
 Assume window space factor 0.2 and a core area factor 0.56 and the core is 2-stepped.

- Q.8 07
- Explain in detail the design of square and stepped core of transformer 08
 - Determine dimensions of core yoke for 100KVA, 50Hz, single phase core type transformer. A square core is used with distance between adjacent limbs equal to 1.6 times the width of lamination. Assume voltage per turn of 14 volts. Maximum flux density 1.1 wb/m², window space factor 0.32 and current density 3 A/mm². Take spacing factor 0.9

- Q.9 07
- How are the mechanical forces developed on transformer winding? How the different forces are estimated? 08
 - Derive the expression for the calculation of no cooling tubes provided on transformer tank.

- Q.10 Attempt any three 15
- Obtain the expression for leakage reactance of 3-phase core type transformer
 - State the cooling methods used for dry & oil immersed type of transformer
 - Explain the design steps of choke coil.
 - Explain with suitable diagram the function of conservator and breather in 3-phase transformer
 - Estimation of no load current in 3-phase transformer

Total No. of Printed Pages:03

SUBJECT CODE NO:- E-32
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(EEP/EE/EEE) Examination Nov/Dec 2017
Power Electronics
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

N.B 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 each section.
 - iii) Draw appropriate waveforms if required
 - iv) Assume suitable data if necessary.

Section A

- Q.1 Solve any five 10
- a) Draw V-I characteristics of IGBT.
 - b) Compare TRIAC with SCR
 - c) Give the merits and demerits of a GTO as compared to conventional SCR.
 - d) What are the two control techniques used in chopper.
 - e) What are the advantages of six pulse converter over two pulse converter
 - f) List the advantages of Power MOSFET.
 - g) What are different classifications of Rectifiers
 - h) Compare circulating and non-circulating current mode of dual converter.
- Q.2 07
- a) Draw and explain the gate characteristics of SCR
 - b) A single phase half wave controlled rectifier has a purely resistive load of R and delay angle $\alpha = \pi/3$.
Determine i) Rectification efficiency
ii) Form Factor
iii) Ripple factor
iv) Transformer utilization factor (TUF)

- Q.3 a) Explain the working principle of Dual Converter 07
- b) A 1-Phase fully controlled bridge converter supplies on Inductive Load. Assume output current is virtually constant, and equal to I_d , Calculate the following if supply voltage is 230v and firing angle $\pi/6$ radian. 08
- i). Average output voltage
 - ii) Supply RMS current
 - iii) Supply fundamental RMS current
 - iv) Fundamental power factor and supply power factor
 - v) Supply harmonic factor
- Q.4 a) Explain with neat circuit diagram and waveform, operation of Single phase fully controlled bridge rectifier with R-L Load 07
- b) Explain Principle of step up chopper and derive expression for average output voltage. 08
- Q.5 a) Explain PWM and FM Techniques of chopper used for operation control. 07
- b) A highly inductive dc load requires 12A at 150V from a 230V single phase AC supply. Give design details for this requirement using midpoint connection. Assume each SCR have to a voltage drop of 1.5V. 08

Section B

- Q.6 Solve any five 10
- a) What are applications of PWM convertors.
 - b) What is UPS and Power conditioners
 - c) Compare 120° & 180° mode of operation of VSI
 - d) Define cycloconverter and give its applications
 - e) Define Inverter and give its different types.
 - f) Draw circuit diagram of 3Φ to 1Φ cycloconverter
 - g) Draw circuit diagram of buck-boost converter
 - h) List the different voltage control & PWM technics used for single phase inverter.

- Q.7 a) Explain with neat circuit diagram and waveform operation of single phase half bridge Inverter with R-L Load. 07
- b) A single phase full bridge inverter is operated from a 48 v battery and is supplying power to 08 a pure resistive load of 10 ohm. Calculate
- i). Fundamental output voltage and the First five harmonics
- ii) RMS value of output voltage
- iii) Output rms power and fundamental power
- Q.8 a) Explain with neat circuit diagram and waveform operation of single phase to single phase Cycloconverter with R-L Load. 07
- b) For Single phase half bridge Inverter, DC input voltage is 200v with 5Ω resistive load. 08
- Determine, i) RMS output voltage
- ii) output power
- iii) PIV
- iv) Total Harmonic Distortion
- Q.9 a) Explain with neat diagram and waveforms operation of Buck converter 07
- b) Explain with neat diagram and waveform of 180° mode of operation of 3phase Inverter with 08 R- Load.
- Q.10 a) Compare Buck, Boost and Buck-Boost converter on the basis of performance parameters 07
- b) An AC voltage controller has resistive load of 20 ohm and RMS input voltage is 230V 50Hz. The SCRs are switched on for $n = 25$ cycles and off for $m=75$ cycles 08
- Determine: i) RMS output voltage
- ii) Input Power
- iii) Average and RMS current ratings of SCR.

Total No. of Printed Pages:2

SUBJECT CODE NO:- E-64
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(EEP/EE/EEE) Examination Nov/Dec 2017
Testing & Maintenance of Electrical Equipment
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

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

- 1) Q.1 & Q.6 are compulsory
- 2) Solve 3. Question from each section (i.e 2 question from remaining in each section)

Section A

- Q.1 A) Solve any three: fill in the blanks 06
- 1) Type tests are carried out on ----- jobs for ----
 - 2) Routine tests are carried out on ----- job for ----
 - 3) Diagnostics tests are carried out to -----
 - 4) The main reason of deterioration of insulation property of transformer oil in presence of -
----- in oil
- B) Solve any two :select right answer 04
- 1) Insulation in L.V & core is normally
 - a) asbestos
 - b) Bakelite
 - c) mica
 - 2) The HV& LV of transformer can be identified without name plate by
 - a) No. of . Turns
 - b) position of coil
 - c) winding conductor size
 - 3) Core of a transformer is normally
 - a) Isolated from ground
 - b) Earthed
 - c) Connected to supply
- Q.2 a) What is the significance of “Tensioner” used in transformer coil winding process. What fault it can develop if not working properly. explain with neat sketch 07
- b) Clearly distinguish between Direct testing of a transformer & indirect testing of transformer parameters with example 08
- Q.3 a) Differentiate between three tests in view of their importance 07
- i) Type test
 - ii) Routine tests
 - iii) Tests on site
- b) Explain what do you mean by “Tolerance”? Giving suitable example, in view of testing? 08

2017

- Q.4 a) Write reasons behind of following faults during operation of power transformer & how you will remove it? 08
- 1) Secondary voltage is less than required
 - 2) One side of transformer gets heated
- b) What will be the effect of blow holes in the casted body of a motor on its performance 07
justify your answer
- Q.5 Write short notes on any three 15
- i) Magnetic im-balance in 3-Ph transformer
 - ii) Magnetic im – balance in 3 ph Induction motor
 - iii) Vibrations are excessive in power transformer
 - iv) Excessive vibration in 3- ph motor

Section – B

- Q.6 Fill in the blanks 10
- 1) The insulation used between two stampings of core of induction motor is -----
 - 2) The scratches on super enamelled coating of copper of conductor can create ----- fault
 - 3) The brushes of slip ring I.M are made up of -----
 - 4) Long form of TEFC motor uses ----- for cooling purpose
 - 5) The thumb rule says that there is ----- of moisture is present in cellulose layer insulation
- Q.7 a) Answer in 4/5 sentences 07
- i) What should be the hysteresis area of loop for motor core?
 - 1) Wide
 - 2) Narrow? justify your answer with reasons
 - ii) The motor stator core should be of which material? NGO, GRGO, HRGO or GO?
- b) If the sleeves of 1-ph . 1.M are found damaged what sort of fault it can develop? Justify your answer 08
- Q.8 a) With neat sketch, explain the operation of X- ray machine used in industries? 07
- b) Why it is required to test the Acidity in transformer oil? How it will React on transformer windings insulation 08
- Q.9 Explain the procedure of DGA analysis giving its 75code with proper sketches? 15
- Q.10 Write short notes on any three 15
- 1) Heathrow testing of motor
 - 2) HV with stand test on motor
 - 3) Use of E.M testing for vibration measurement
 - 4) Ultra sonic testing on transformer?

SUBJECT CODE NO: E-96
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(EEP/EE/ EEE) Examination Nov/Dec 2017
Microcontrollers & Applications
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i. Solve three questions from each section.
 - ii. Q.1 & Q.6 are compulsory.
 - iii. Assume suitable data if necessary.

Section A

- Q.1 Solve the following questions 14
1. What is the pipelining in 8086?
 2. What is the function of Instruction Pointer in 8086?
 3. What is the function of instruction decoder in 8086?
 4. Define immediate Addressing mode with example for 8086.
 5. What is function of Data Pointer in 8051 microcontroller?
 6. What is the importance of baud rate in 8051 microcontroller?
 7. How the bit addressing is distinguished from byte addressing?
- Q.2 a) Draw and explain programming model of 8086 microprocessor. 07
- b) Explain the different addressing modes of 8086 microprocessor. 06
- Q.3 a) Explain the different data transfer instructions of 8086. 07
- b) Write ALP to Add two 8-bit numbers which are stored at internal RAM location 20H to 21H. store the 16-bit result at 30H & 31H. 06
- Q.4 a) Explain the stack and the stack pointer of 8051. 07
- b) Explain in detail TCON special function register of 8051 06

- Q.5 Write short note on (any three)**
- i) Features of 8086 05
 - ii) Comparison of microprocessor & microcontroller. 04
 - iii) Logical instructions of 8051 04
 - iv) Subroutines 04

Section B

- Q.6 Solve the following questions.** 14
- a) Explain cy and AC flag of 8051.
 - b) What is the use of internal RAM in 8051?
 - c) Explain the function of port 0 of 8051 microcontroller.
 - d) Explain function of ALU of 8051 microcontroller.
 - e) What is vectored & non-vectored interrupts?
 - f) Explain the working of counter in 8051 microcontroller.
 - g) What is the priority of interrupt?
- Q.7**
- a) Explain in detail serial data transmission mode 0 of 8051 microcontroller. 07
 - b) Write a program to generate 2kHz frequency on P1.4bit use timer 0. 06
- Q.8**
- a) Draw the interfacing of stepper motor with microcontroller 8051. Write a program to rotate the stepper motor continuously by step angle 1.8°. 07
 - b) It is required to interface 7-segment display to 8051 microcontroller. Draw the interfacing diagram and write a 3 program to display the BCD digits 0 to 9. 06
- Q.9**
- a) Explain detail how the timing operation is performed in 8051 microcontroller. 07
 - b) Draw a functional block diagram of 8051 & explain. 06
- Q.10 Write a short note (any three)**
- 1) Interrupts of 8051 04
 - 2) Features of 8051 05
 - 3) SFRS of 8051 04
 - 4) Keyboard interfacing. 04

SUBJECT CODE NO: E-189
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(EEP/EE/EEE) Examination Nov/Dec 2017
Special Purpose Electrical Machines
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

N.B

1. Q.1 & Q.6 are compulsory.
2. Solve any 2 questions from remaining.

Section A

- Q.1 Solve any five from following. 10
- a) What are the advantages of BLDC motor?
 - b) Write any two applications of LIM.
 - c) Why stepper motor called so?
 - d) What is meant by voltage regulation?
 - e) What is electronic commutator?
 - f) What is meant by “Axial air gap”?
 - g) Why induction generator is often called as an asynchronous generator?
 - h) What is maximum available power rating of any FHP motor?
- Q.2 07
- a) Explain construction, working & application of hybrid stepper motor.
 - b) Explain different methods of voltage control in induction generator. 08
- Q.3 08
- a) Explain construction, working & application of PSPM.
 - b) Describe construction & working of LIM. 07
- Q.4 08
- a) Explain construction operating principles & working of BLDC motor.
 - b) Explain variable reluctance stepper motor in detail. 07
- Q.5 07
- a) Explain self-excitation requirements in case of induction generator.
 - b) Give the comparative study of three types of stepper motor. 08

Section B

- Q.6 Solve any five 10
- a) Why electric heating is preferred over other form of heating?
 - b) What is Arc Blow?
 - c) Write any four applications of resistance oven.
 - d) What are the various reasons of heating element failure?
 - e) What is welding?
 - f) State faradays first law of electrolysis.
 - g) Define convection of heat.
 - h) List out types of welding equipment's.

- Q.7 a) Explain different methods of induction heating. Also mention its applications. 08
 b) What is dielectric heating? Explain factors on which dielectric loss depends. 07
- Q.8 a) Explain factors affecting electro-deposition. 08
 b) Explain in detail application of electrolytic process used for metal extraction. 07
- Q.9 a) How does a buck boost transformer differ from isolating transformer? Can buck boost transformer be used to power low voltage circuit? 08
 b) Explain rectifier transformer in detail, with applications. 07
- Q.10 a) Explain MIG welding process in detail. 08
 b) What is isolation transformer? Explain different applications of isolation transformer in detail. 07

SUBJECT CODE NO: E-215
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(EEP/EE/EEE) Examination Nov/Dec 2017
Electromagnetic Fields
(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) Attempt any two questions from Q.no.2 to Q.No.5
- iii) Attempt any two questions front Q.no.7 to Q.No.10
- iv) Assume suitable data wherever necessary
- v) Figures to the right indicates full marks.

Section A

- Q.1 Attempt any five 10
- i) Define electric flux and Electric flux density
 - ii) Given $A = 2ax + 3ay + 6az$
 $B = ax - 2ay + 4az$
Find a) $A \cdot B$ b) $\bar{A} + \bar{B}$
 - iii) Find angle between vector $\bar{A} = 4ax - 2ay - az$ and $\bar{B} = ax + 4ay - 4az$
 - iv) If Co-ordinates of points P and Q are P(2, 3, -4) and Q(4, 25⁰, 60⁰) find distance PQ
 - v) Define the term gradient.
 - vi) Give the physical significance of divergence
 - vii) Write the expression of Differential volume and differential vector length in spherical Co-ordinate system.
 - viii) Explain what do you mean by Gaussian surface
- Q.2 a) Sketch neat diagram and show incremental length, surface area and volume in cylindrical Co-ordinate system. 07
- b) Transfer to cylindrical co-ordinate $F = 10ax - 8ay + 6az$ at point P (10, -8, 6) 08
- Q.3 a) Define electric field intensity and derive expression for electric field intensity due to infinite sheet of charge. 08

b) Calculate the total charge within the indicated volume if $e_v = 10 z^2 e^{-0.1x} \sin(\pi y)$ 07

$$-1 \leq x \leq 2, \quad 0 \leq y \leq 1, \quad 3 \leq z \leq 3.6$$

Q.4 a) State and explain Gauss Law. 06

b) Given $D = 2xyax + x^2ay$ c/m². Find the total charge lying within the region. 09
 $0 \leq x \leq 1, \quad 0 \leq y \leq 2, \quad 0 \leq z \leq 3$ by two different methods.

Q.5 a) What do you mean by potential and Potential difference? Deduce the expression for potential difference due to system of charges. 07

b) For the point P(3, 60°, 2) in cylindrical co-ordinate and the potential field $v = 10(\rho + 1)z^2 \cos \phi$ mts in free space. Find at point P 08

a) V

b) \bar{D}

c) $\frac{dv}{dN}$

d) aN

Section B

Q.6 Attempt any five 10

i) Compare self and mutual inductance

ii) State the properties of perfect metallic conductor

iii) Justify the expression $\nabla \cdot B = 0$.

iv) State uniqueness theorem

v) State Ampere's circuital law

vi) What do you mean by magnetization in magnetic material

vii) What do you mean by displacement current and displacement current density

viii) What do you mean by magnetic dipole & magnetic dipole moment

Q.7 a) Derive boundary conditions of the normal and tangential component of electric field at the interface of two different dielectric material. 07

b) A current density is given by

$$J = \frac{100 \cos \theta}{r^2 + 1}, \text{ ar } A/m^2$$

i) How much current flow's through the spherical cap $r = 3$, $0 \leq \theta \leq \pi/6$, $0 \leq \Phi \leq 2\pi$

ii) Same current flows through the cap $r = 10$, $0 \leq \theta \leq \alpha$, $0 \leq \Phi \leq 2\pi$ find α

Q.8 a) For the steady magnetic field show that $\nabla \times H = J$ 08

b) Find $\nabla \times G$ in cylindrical co-ordinate at $P(2, 30^\circ, 3)$ if $G = \rho\Phi Z \text{ az}$ 07

Q.9 a) For a time varying field show that $\nabla \times E = \frac{-\partial B}{\partial t}$ 07

b) Evaluate both the sides of stokes theorem if $H = 6xy \text{ ax} - 3y^2 \text{ ay}$ A/m and rectangular path around $2 \leq x \leq 5$, $-1 \leq y \leq 1$, $z = 0$ 08

Q.10 Attempt any three 15

i) Explain in detail scalar magnetic potential

ii) Explain the term magnetic dipole moment and magnetization.

iii) State and explain Biot savart Law

iv) Explain nature of dielectric material.

SUBJECT CODE NO: E-256
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(EEP/EE/EEE) Examination Nov/Dec 2017
Control System Engineering
(REVISED)

[Time: 3 Hours]

[Max.Marks:80]

- N.B
- Please check whether you have got the right question paper.
- Attempt any three questions from each section.
 - Question No.1 and Q.No.6 are compulsory.
 - Solve any two questions from remaining from each section.
 - Figures to the right indicates full marks.

SECTION A

Q.1 Solve any five.

10

- Define transfer function.
- What is time variant and time invariant?
- Define Non-Touching Loop and Loop gain.
- What do you mean by signal flow graph?
- State mason's Gain formula.
- Write Torque balance equation for as
 Ideal- Inertia
 Ideal- spring.
- What are the two types of Mechanical system?
- Define settling time and peak overshoot.

Q.2 a) Obtain the overall transfer function $C(s)/R(s)$ for the system, shown in fig.1.

08

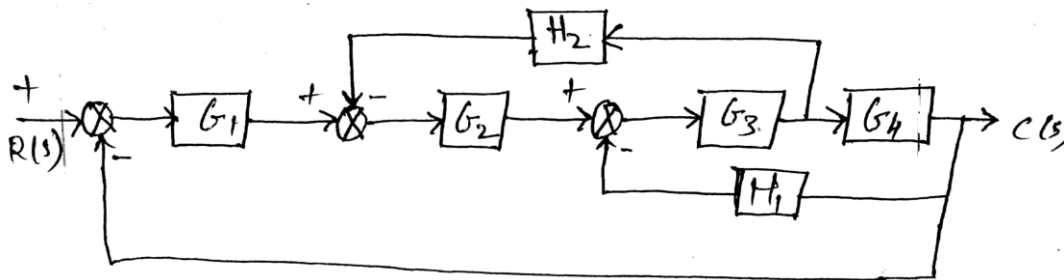


Fig-1

b) For the Mechanical system show in fig. 2. Draw the force – voltage and force current analogous circuits.

07

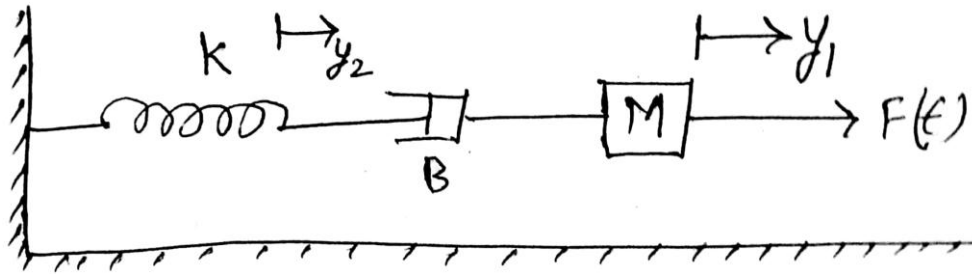
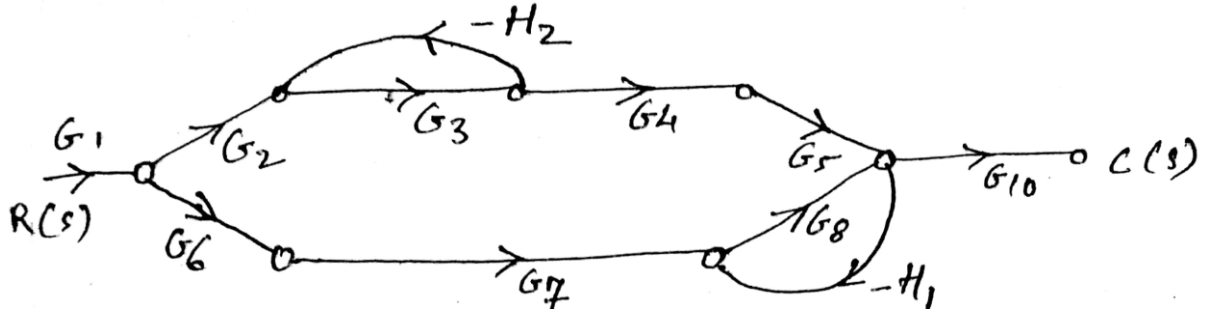


Fig 2

Q.3 a) Determine the overall Transfer function C/R, from the signal flow graph shown in fig.3. 08



b) Explain the synchro and its types. 07

Q.4 a) Explain steady state error constant. 07

b) Find the stability of system by Routh's criterion. 08

- i) $s^5 + s^4 + 2s^3 + 2s^2 + 3s + 1s = 0$
- ii) $s^4 + 2s^2 + 1 = 0$

Q.5 a) A unity feedback control system has an open Loop transfer function. 08

$G(s) = \frac{s}{s(s+1)}$ Find the rise time, percentage overshoot, peak-time, and setting time for a step input of 10 units. Also determine the peak overshoot.

b) Draw the polar plot of 07

$$G(s) = \frac{10}{s(s+1)(s+2)}$$

SECTION B

- Q.6 Solve any five. 10
- What do you mean by angle of Departure?
 - What is polar plot.
 - Define observability and controllability.
 - Define gain Margin in bode plot.
 - What are compensators?
 - What is sensitivity?
 - Define BIBO stability?
 - What is meant by frequency response of system?

- Q.7 Sketch the root Locus of the system has an open Loop transfer function. 15
- $$G(s) = \frac{K}{s(s+4)(s^2+4s+20)}$$

- Q.8 Sketch the bode plot and hence find Gain crossover frequency, phase crossover frequency, Gain Margin & phase margin. 15

$$G(s) = \frac{10(1+0.1s)}{s(1+0.01s)(1+s)}$$

- Q.9 a) Sketch the polar plot for the transfer function. 08

$$G(s)H(s) = \frac{10}{s(s+1)(s+2)}$$

- b) Determine the state transition matrix for the system. 07

$$\begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \end{bmatrix} = \begin{bmatrix} -2 & 0 \\ 1 & -1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u$$

Where $u > 0$

- Q.10 a) Test for controllability & observability for given system. 08

$$\dot{x}(t) = \begin{bmatrix} -1 & 0 & 0 \\ 0 & -2 & 0 \\ 0 & 0 & -3 \end{bmatrix} x(t) + \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix} u$$

$$y = [1 \ 0 \ 2]x(t)$$

- b) Explain the effect of addition of poles and zeros on root Locus. 07

SUBJECT CODE NO: E-296
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(EEP/EE/EEE) Examination Nov/Dec 2017
Microprocessor & Interfacing
(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. Solve any two from Q.2, Q.3, Q.4 and Q.5.
 3. Solve any two from Q.7, Q.8, Q.9 and Q.10.
 4. Assume suitable additional data if necessary.
 5. Figure to the right indicates full Marks.

Section A

- Q.1 Solve any Five 10
- a. What is the function of accumulator?
 - b. Why multiplexing is done in 8085.
 - c. What is flag register.
 - d. What happen when SHLD instruction executed.
 - e. Define machine cycle.
 - f. Give the difference between JZ and JNZ.
 - g. Define
 - (a) ROM
 - (b) Assembler.
 - h. Give functional categories of 8085 instructions.
- Q.2 a) List out different registers in 8085. What different temporary register in 8085? Explain Each register in detail with example. 08
- b) Enlist data transfer instruction of 8085 & Explain any four in detail. 07
- Q.3 a) Explain different control signal of 8085. 08
- b) Write a delay subroutine to generate a delay 50 msec if operating frequency of 8085 microprocessor is 3MHz. 07

Q.4 a) Write a ALP to multiply two 8 bit numbers stored in memory location C200H and C201H. Store the result in memory location D200H and D201H. 08

b) Explain stack in detail. 07

Q.5 a) Explain direct addressing and Indirect addressing modes of 8085. 08

b) Draw and Explain the timing diagram of memory read cycle. 07

Section- B

Q.6 Solve any five 10

- Mention the purpose of SID and SOD.
- What is use of 8251 USART?
- Enlist different modes of 8255.
- What are two modes of DMA execution?
- Write control format in BSR mode.
- What is I/O map I/O mode?
- Write output control signals used in 8259 A.
- Write an instruction that enables all the interrupts in an 8085 system.

Q.7 a) Explain in detail block diagram of 8259. 08

b) Explain in detail block diagram and function of each block of 8251 USART. 07

Q.8 a) Discuss the architecture and working of 8253 timer 08

Q.8 b) Draw interfacing diagram of stepper motor using 8255 with 8085 & write ALP to rotate in anticlockwise direction. Assume delay subroutine available at "DELAY". 07

- Q.9 a) Explain the block diagram of 8257. 08
- b) Draw the interfacing diagram to interface LED's to 8085 through port A & B of 8255 & Write ALP such that when P_A LED's are ON P_B LED'S are OFF vice versa. 07

Q.10 Write short notes(any three) 15

- a) ADC 0809 and DAC 0808 interface to 8085.
- b) 8253 Modes.
- c) DC Motor speed control
- d) Measurements of power factor using 8085

SUBJECT CODE NO: E-339
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(EEP/EE/EEE) Examination Nov/Dec 2017
Power Systems Analysis
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

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

SECTION - A

Q.1 Solve any five questions

10

- What is impedance & reactance diagram?
- What is bus?
- What is bus Admittance matrix?
- Define the terms
 - node
 - link
 - tree
 - Co- tree
- If reactance in ohm is 20Ω find per unit value for a base of 20 MVA & 10 KV.
- What do you mean by PQ bus?
- What is need of base values?

Q.2 a) Draw the per unit reactance diagram for the power system show in fig(1). Neglect resistance & use 08 of a base of 100MVA, 220KV in a 50Ω line. The rating of generator, motor & transformer are as follows:

G:- 40MVA, 25KV, $X'' = 20\%$

M:- 50 MVA, 11KV, $X'' = 30\%$

T₁:- 40MVA, 33Y/ 220 Y KV, $X=15\%$

T₂:- 30 MVA, 11Δ/ 220 YKV, $X=15\%$

Load:- 11KV, 50 MW +j68 MVAR.

Determine new per unit values of reactance of transmission line, & new values of per unit Reactance of transformer T₁ generator G, transformer T₂ & Motor M.

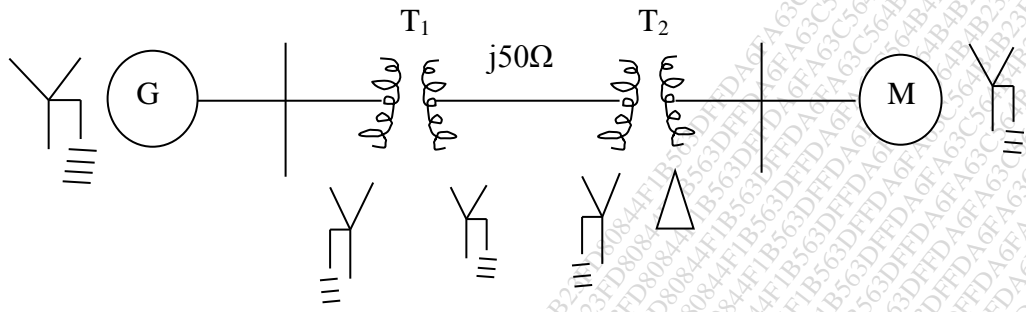
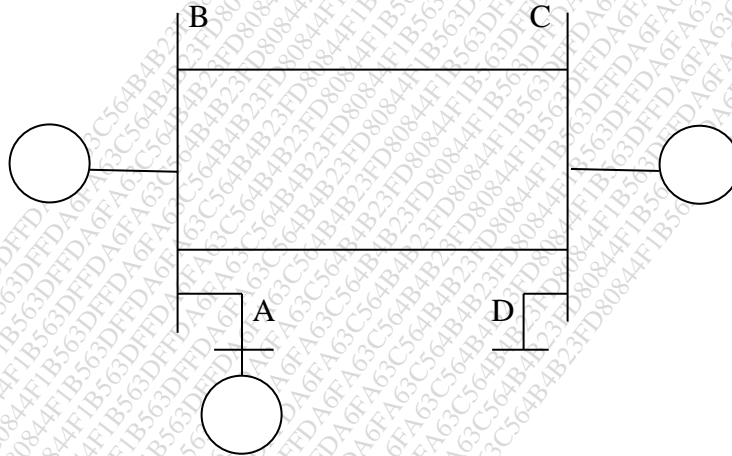


Fig (1) single line diagram

b) Prove that per unit in impedance of a Transformer is same weather computed from primary or secondary side. 07

Q.3 (a) For a power system as shown in fig (2) Obtain A, \bar{A} 08



Fig(2)

(b) Determine primitive network equation. 07

Q.4 a) Explain step by step procedure for NR method of load flow studies. 07

b) Find the bus impedance matrix for system whose reactance diagram is shown in fig(3). All impedances are in p.u 08

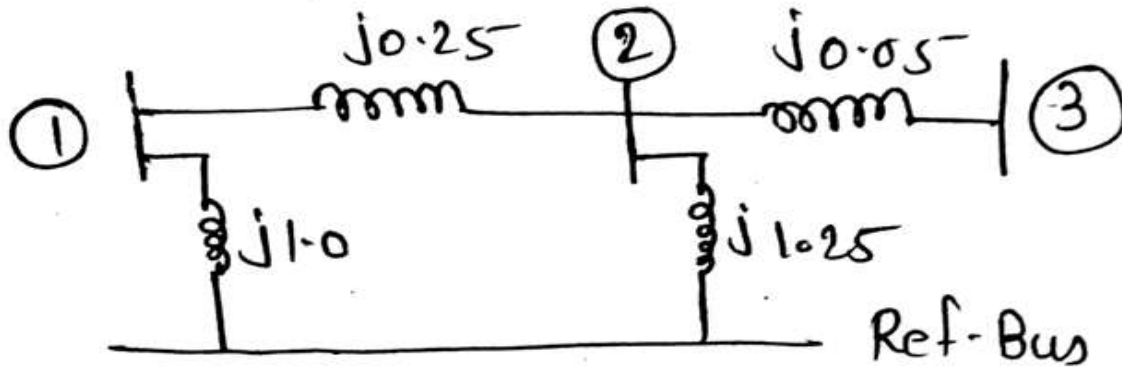


Fig.3

- Q.5 a) Derive an expression for symmetrical components of $V_S = A^{-1}V_P$. 08
- b) Derive the expression for transients on transmission line. 07

SECTION -B

- Q.6 Solve any five questions of following. 10

- (i) What are sequence impedance & sequence network?
- (ii) How the faults are classified?
- (iii) Define subtransient reactance.
- (iv) What is meant by doubling effect?
- (v) What is the sequence operator?
- (vi) Write down the equations to convert symmetrical components into unbalanced Phase current.
- (vii) What is need for load flow study?

- Q.7 a) Explain sequence impedance of transmission line. 08
- b) In a 3- & 4- wire system, the currents in R, Y & B lines under abnormal conditions of loading are as under. 07

$I_R = 100 \angle 30^\circ$ A; $I_Y = 50 \angle 300^\circ$ A, $I_B = 30 \angle 180^\circ$ A. Calculate Positive, negative & zero sequence currents in R line & return current in neutral wire.

Q.8 a) Explain Z_{bus} building for Type 2 & Type 3 modifications. 07

b) A 30 MVA, 11KV, 3- ϕ synchronous generator has a direct sub transient reactance of 0.25 p.u. 08
 The negative & zero sequence reactance are 0.35 p.u & 0.1 p.u. respectively. The neutral of generator is solidly grounded. Determine subtransient current in generator & line to line voltages for subtransient condition. When a single line to ground fault occurs at generator terminals with generator operating unloaded at rated Voltage.

Q.9 a) Derive the expression to determine fault current for L- L fault & draw sequence network. 07

b) Draw positive, negative & zero sequence impedance diagram for fig. (4) 08

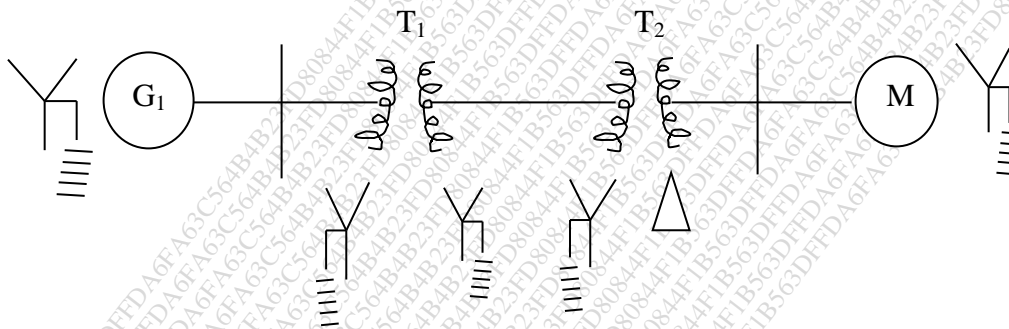


Fig (4).

Q.10a) Explain open conductor fault. 08

b) Explain on load sequence impedance of synchronous machine. 07

Total No. of Printed Pages:2

SUBJECT CODE NO:- E – 165
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(EEP/EE/EEE) Examination Nov/Dec 2017
Energy Conservation & Audit
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i. Q1 & Q6 are compulsory.
 - ii. Attempt any two from remaining questions from each section.

Section A

- Q.1 Solve any five. 10
- a) Define energy audit.
 - b) Mention the sources of Greenhouse gases.
 - c) State the types of energy audit.
 - d) Give the effects of ozone layer depletion.
 - e) What are applications of bottoming cycle?
 - f) What do you mean by designated consumers?
 - g) Which instruments are used to measure air velocity & air flow in duct?
 - h) Define ton of refrigeration.
- Q.2 07
- a) What is BEE? Explain its role in energy conservation.
 - b) Explain different types of measuring instruments used for energy Audit. 08
- Q.3 08
- a) What are the methods to calculate boiler efficiency? Explain any one in detail.
 - b) Explain energy efficiency opportunities in HVAC of refrigeration system. 07
- Q.4 07
- a) Explain waste heat recovery system in detail.
 - b) What is cogeneration? With the help of diagram explain extraction condensing turbine cogeneration system. 08
- Q.5 Write short notes on any three. 15
- a) CDM & its objectives.
 - b) Global warming
 - c) Energy manager
 - d) Energy conservation Act 2001.

2017

Section B

- Q.6 Solve any five. 10
- a) What are the different methods of financial evaluation?
 - b) What is PI?
 - c) What is DSM?
 - d) What is power factor? Mention the needs to improve it.
 - e) What is meant by TOD – Tariff?
 - f) Define room index for light system.
 - g) Define harmonics.
 - h) How will you calculate discount factor?
- Q.7 a) Explain simple pay back period method. Also state its advantages & disadvantages. 07
b) Give comparison between NPV & IRR method of financial analysis for energy conservation projects. 08
- Q.8 a) Explain the important factors of the electricity Act 2003. 07
b) Explain working of maximum demand controller & APFC panel. 08
- Q.9 a) Explain in detail the procedure to carry out energy audit for steel plant. 08
b) Explain in detail the procedure to carry out energy audit for commercial establishment. 07
- Q.10 Write short notes on (any three) 15
- a) Soft starter
 - b) Electronic ballast.
 - c) Uncertainty & sensitivity analysis.
 - d) Electricity billing & load management.